

Dog Field Care Manual

Dog Field Care Manual (revised Oct 2017)

How to Care for mangy and sick dogs in poor countries (and in developed countries, too)

By Harrell Guy Graham (harrellgraham@yahoo.com) (send suggestions/corrections to that email address and send me your email address if you want me to send you revised editions). Many thanks to Merritt Clifton of Animals 24/7 for his help with this manual and to my friend, Dr Lance Hewitt, MD, PhD, MPH for the many hours we've spent discussing medicine. And many thanks to Dr Peter P. Denooij, DVM for his efforts to shape the manual as well as his promotion of inexpensive Calcium Chloride non-surgical sterilization for male dogs and cats.

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"Minow" with Demodex mange



Minow after treatment



'Mee' before



'Mee' after



'Red Dog' w/ bacterial infection



'Red Dog' after treatment

Above are some examples of dogs you can easily treat 'in the field' with a dollar or two worth of medicines in poor countries without using a veterinarian. The dogs above are in Thailand.

Why do it?

Have you ever seen a sick or mangy dog and you found yourself saying: "I wish there were something I could do to help that poor creature?" Are you an expatriate living in a second or third world country where these sick and wounded animals are everywhere? Are you someone in a richer country who would like to help?

And are you a 'dog person', that is, someone who appreciates 'man's best friend', who has benefitted from a dog's friendship, or who can simply appreciate the fact that for thousands of years dogs have

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helped us survive? Dogs paid a price for becoming domesticated because there was a time when dogs didn't need our help, when they knew how to hunt and survive on their own (the way cats still can). We humans 'asked' dogs to live with us so that we could benefit from their companionship, and guarding the livestock and warning us of dangers and protecting us from dangers. In exchange, dogs 'unlearned' how to hunt and survive on their own in order to become our helpers, companions and pets. The Nova special, "Dogs Decoded", mentions that without dogs we as a species may not have survived the transition from hunter-gatherers to agriculture because it was dogs who protected our herds--protein--from prey.

Spaying & Neutering: You can help our dog and cat friends regardless of your location.

As much as I love being with and caring for sick dogs, I realize my efforts do not go far enough in helping to reduce suffering. **For the truth is**, there are literally hundreds of millions of stray dogs, especially in the poorer countries. Their suffering is incredible and in their short lives they will never be helped or fed properly.

"Many are beaten or chased away merely for begging for a scrap of food".

(calciumchloridecastration.com)

The most effective way, bar none, for you to help these suffering creatures is to help spay and neuter them **so they don't produce so many offspring**. And herein is described a way to do this---not for the usual 50-100 dollars per animal—but only **for a few dollars!** In contrast, I often had to spend *more, sometimes a lot more*, to revitalize an itching, sick, worn-down dog—to get rid of his mites/mange, worms, ticks, fleas, lice, tick-borne pathogens and other infections, and to feed him properly. And that was only for one dog. And after I revitalized that dog, he would jump right back into making a batch of puppies, who themselves would grow up, to make exponentially more offspring, who themselves would suffer. From one male and one female you can get something that looks like this exponential number of offspring **2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2048....**

So, yes, it is satisfying for me to ride my motorbike around to the houses of the poor and the Buddhist temples, administering medicines to alleviate suffering. But **I was like the little Dutch boy** with his finger in the dyke. And, in some way, you could say I was—by not doing enough spaying and neutering---actually making the situation worse. Because here I was, boosting the power of an animal that was going to be an even stronger and more prolific puppy-maker where the puppies and their offspring would grow up to face a life-time of suffering with mites living under their skin causing constant itching and loss of sleep and other infections, as well as the constant hunger. **The hunger is ever-present.** You see it in their faces and certainly their visible-ribs, emaciated, worn-down-from-hunger bodies. Being hungry like this is a terrible thing for the dog to endure and it is hard to watch. So the solution is to do both: address the suffering animals in front of me by administering food and medicine to them AND to help prevent future suffering through sterilization.

There is a reason we don't see 'regular' surgical castration being utilized in poor countries. The reason is: **it is an expensive technique** in countries where the human population lives on a dollar or

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two per day. You can't tell the people in India, for example, that they need to come up with 10, 20 or 30 dollars to surgically castrate one dog or cat, especially when there are over a hundred million strays in India alone. There just isn't that kind of money available in a country where that amount will feed a poor family in India for weeks or months. But even if there were money available there still are not enough vets available to do regular surgical castration. Castration of male dogs is currently done using surgical techniques, requiring expensive and often unavailable vets, anesthetics, equipment and surgery.

But there is a cheaper and **easier way** to do this—**no surgery required!**--but most vets have not learned this new technique, which does not take long to learn. And this is where you, the reader, come in to the picture. Because by donating a few or more dollars to one of the organizations pioneering this new, inexpensive NON-surgical sterilization, you can start to tip the scales so that this technique starts to get utilized more. Even a 5 or 10 dollar donation from you can prevent the suffering of future offspring. There are very few things I can think of that can have such a large and profound impact regarding suffering than this. I have no financial interest in these organizations, and these organizations spend the money on sterilization, not 'overhead'. And I ask for no donations for myself in this 'Dog Field Care Manual'. I spend my own money on my own projects. But I realize that because you are reading this, you want to 'do something' and that something that you do can have an impact greater than what I do when I am administering meds to dogs in Thailand. Because only a few dollars can prevent untold suffering to the hundreds or thousands of offspring of cats and dogs--merely by your helping with this ridiculously cheap method of dog and cat 'family planning'.

“Sterilization is the only way to develop humane population control programs in impoverished places and this needs to be done on a large enough scale to make a difference.”
(calciumchloridecastration.com)

Calcium chloride videos: <https://www.youtube.com/watch?v=iq-5YB4KDrI> Procedure details & Up-to-date info: <https://www.youtube.com/watch?v=d9sfzpNjiss> and <http://www.spayfirst.org/programs/non-surgical-sterilization/> If these videos are not at these locations then on youtube (and/or google) use search terms; 'Calcium Chloride Parsemus Foundation' and 'Calcium Chloride Castration')

We will never be able to reduce the suffering of our dog and cat friends if we insist male dogs and cats must only get expensive surgical castration. There isn't enough money for that, nor are there enough vets. Even in America, around 2.5 million healthy dogs and cats are euthanized every year.

There is a better way. And by helping spread this far better and far cheaper technique—Calcium Chloride non-surgical technique--you will be helping to overcome the inertia that many vets have from their training in vet school where the only technique they learned was the expensive and time consuming and infection-prone method of surgical castration. **But now there is a technique—Calcium Chloride injections** into each testicle---**which even a well-trained NON-vet can learn.** Think about that! And consider that even if somehow we could come up with the 30-50 dollars for SURGICAL castration by vets per animal for each of the hundreds of millions of strays, there still are not enough veterinarians to do all those surgical castrations. So we will never, ever solve the problem of this monumental suffering if we don't embrace the easier, simpler and cheaper technique of NON-surgical castration which even well-trained NON-vets can perform in countries such as India, Thailand and

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China where there is such massive suffering of man's best friend that it is hard to comprehend until you have seen it first-hand or in graphic videos. Already in poor countries people who are not doctors or nurses administer basic medical care to people. Certainly some can be trained to do this simple non-surgical technique to dogs.

Even in the USA, a rich country, there isn't the time, funds or vets available to do the number of surgical castrations that are needed to stop the suffering and slaughter of the 2.5 million healthy dogs and cats euthanized each year.

I want to suggest to vets in richer countries that you can still make good money using CaCl non-surgical technique if, instead of charging \$100 for a male neuter for surgical castration, you instead charge 20-50 dollars for a non-surgical CaCl. I believe your profit margin—which you need to maintain your business--may be the same, because you will not have expenses for anesthetics, sterile equipment, prep time, etc that you now have with surgical castration. And by spreading the use of this technique you will be helping to eliminate suffering in your country as well as in other countries, because the more people who know about it, then the more it will catch on.

Watch these wonderful videos at this 'Parsemus Foundation' youtube link. And vets note: you can learn how to do this technique from these videos, which contain detailed instructions. If the link below fails, then just type into the youtube search window 'Parsemus calcium chloride'.

https://www.youtube.com/results?search_query=parsemus+foundation+calcium+chloride

But note that **Spay First!** is coming out with some more up-to-date videos so please check the website of Spay First! You can also donate to organizations such as Spay First! whose motto is "**Prevention is the Solution**", a wonderful organization founded by Ruth Steinberger which is promoting this easy and inexpensive—as little as \$3!—method of sterilization. <http://www.spayfirst.org/> Even a modest donation by you to Spay First! can prevent an untold amount of suffering. A \$65 donation will allow 20 (twenty!) male dogs to be neutered, an astounding feat with an astronomical amount of suffering prevented!

I wish everyone could witness the hunger and starvation and neglect and minute-to-minute suffering that millions of dogs endure in poor countries. Please take the time to see the videos mentioned above and also: **use your imagination**, and then think how a modest donation by you to Spay First! can prevent a great deal of this suffering. Not only that, but you will be helping Calcium Chloride non-surgical sterilization to 'catch on'---because now there is resistance in the vet community because all they have been taught is expensive surgical castration. But donations to Spay First! can help to not only relieve suffering directly, your donation will also be helping to validate this wonderful method so that other vets will adopt it.

Dr Peter Denoij, DVM is one of the premier educators in Calcium Chloride non-surgical sterilization for male dogs and cats and he can help you along with your veterinarian order the necessary chemicals; he will have them shipped right to the door of your vet in whatever country you are in. Two links where

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you can learn more as well as reach him are <http://peterdenooij.0.gr8.com/> and <https://www.facebook.com/Calciumchloridecastrationfordogsandcats>

It is my hope that the animal welfare community work on passing legislation that allows trained non-vets to do the Calcium Chloride castration technique in the richer countries (the poorer countries probably won't have so many barriers). There are not enough vets in the world to neuter all the male dogs and cats, even using the simple, cheap calcium chloride technique. Trained volunteers, however, could become the force that is needed to prevent so much suffering from the hundreds of millions of strays—all by learning the calcium chloride non-surgical sterilization technique. But even if bureaucracy and resistance prevents non-vets in richer countries from being able to do it, it is in the poorer countries where the suffering is the greatest, where there are many millions of unwanted, suffering dogs.

By reducing the crazy numbers of newborns you will be performing a great service. Even just a handful of dollars donation from you can prevent more suffering than I am ever able to 'fix' by administering medicines. This is not an exaggeration. That means that from your armchair you can accomplish more than I ever did in Thailand.

See the index under 'Depo-Provera' for pros and cons of using inexpensive injected Depo-Provera as contraceptive for female dogs & cats.

And of course the sick and hungry creatures must be helped, too.

The satisfaction that comes from watching a mite-infected, sick and possibly hairless dog gain his strength and beauty back over a period of just a few weeks is hard to beat—all because you gave him a few dollars (or less) of medicine---this feeling is hard to beat if you love dogs.

To us Westerners those dogs we see who have no or little hair, reddened, inflamed skin and are itching and scratching, —these dogs appear to need expensive hospitalization. **This manual will tell you how to 'fix' those pathetic-looking dogs, often for only a dollar**—or even less. (Money units here are given in U.S. dollars). That is, if you do it yourself. But if you take it to a vet in say, Thailand, you can end up spending 5, 10, 20 or more dollars. In the West it would be hundreds of dollars. Besides, most Western vets have never treated the kinds of cases you will be treating. Because you will see so many cases of Mange, you will have more experience than Western vets treating bad cases of mites (mange) and skin infections. (But it is still very helpful, if not essential, that you find a local vet to take those animals to that you cannot 'fix').

If you live in Thailand, for example, you can visit the temples in your town or village where you will find needy dogs. Or just look around on the street corners. Taking that many dogs to the vet is prohibitively expensive and time consuming. Easier for your to sit down and pull your cheap medicines out of your backpack while the dogs gather round you to get the dog food you are putting down for them. That way, you can easily administer the meds (often: Ivermectin) and clear up the terrible suffering the itching, infected dogs are experiencing—all for just a little money.

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[Ivermectin, your Number One Med](#), costs pennies per dose, cures Mange/Mites, [alleviates terrible suffering](#).

The cost of medicine is often very cheap in countries like Thailand, where I have lived, and Ivermectin can be bought inexpensively in the USA at animal supply stores and from the internet from, for example, [revivalanimal.com](#). There are a handful of bugs, parasites and bacteria which can make the life of a dog miserable. But because medicine is so cheap in poorer countries you can relieve the dogs suffering with just two oral doses of Ivermectin given two weeks apart for just 10 cents—the cost of two doses of Ivermectin. For example, for dogs infested with mites and little or no hair you can squirt the Ivermectin into a small bowl of milk which the dogs will drink. Or you can squirt the Ivermectin directly in their mouths if they will let you get close to them.

I repeat myself a lot in this manual, especially concerning Ivermectin and how to administer it, because getting the dosages right, and doing it right, is important. Some of the other topics need repetition, too—for example, Oral Rehydration Solution (ORS) and rabies vaccinations for yourself BEFORE you are bitten or get saliva on your hand.

Do not give Ivermectin to Collies, Whippets, Australian Shepherds, Sheepdogs, or their crosses.

“White feet, do not treat” (For a full list of breeds, go to <http://www.vetmed.wsu.edu/vcpl/breeds.aspx>). Instead of Ivermectin, use Amitraz dips.

And **do not give Ivermectin to very young puppies or to very sick animals, especially those with fevers**, because fevers and a very young puppy has a Blood Brain Barrier (BBB) that is ‘open’ and can let the Ivermectin cross the BBB. This crossing the BBB is the issue with collies, whippets, sheepdogs, etc. Even if not sick or feverish, those breeds have a BBB which has a genetic difference which allows the Ivermectin to cross into the brain.

Ivermectin is a very safe medicine most all the time, and has wide margin of safety meaning you can accidentally overdose a dog that is not one of the sensitive breeds and not harm them unless you give an absurdly high amount. (see detailed info near end of manual).

You can carry your bottle of Ivermectin everywhere you go and administer it anytime you see one of these skin-inflamed, losing-hair, itching-terribly dogs. Even if you decide not to obtain and use all the other medicines mentioned here, **if you were going to do just one thing to alleviate suffering in these dogs**, then **buying a bottle of Ivermectin would be it**. A little bit **orally**--(you do **NOT** need to inject—see below)--given to a dog with red inflamed skin, itching terribly, with hair loss—will kill the mites, stop the itching and suffering, allow the dog to get a good night’s sleep. Keep a metal or plastic bowl and a couple of boxes UHT milk in your pack—needs no refrigeration until opened. When you’re out and about and see an inflamed itching dog who won’t let you close enough to squirt it in his mouth, pull your bowl out, pour a bit of milk in it, squirt the correct amount of Ivermectin in that, (see below for correct dosages of Ivermectin), set the bowl down and step away so the dog can approach and

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watch your dog friend lap it up. Repeat two weeks later and, presto, terrible itching mites are gone. Even just one dose can work (2 doses 2 weeks apart are better).

Important note: The bottles of **Ivermectin** often say on them: **“For injection of cattle and swine”**. This is because the US Food & Drug Administration in the U.S. (and possibly other countries as well), have approved Ivermectin for use in those animals and, technically speaking, using Ivermectin in dogs is considered “off label”. “Off label” does NOT mean ‘illegal’, ‘dangerous’, or ‘not-allowed’ or ‘not appropriate’. **Vets everywhere, however, in the known universe, including all vets in the United States, routinely use Ivermectin in dogs.** Using a medicine “off label” is done all the time, and with good reason, by human doctors as well as vets, because, in the case of Ivermectin, it is a great medicine for the job of killing Sarcoptes mites where you only need to give two oral doses spaced two weeks apart. One dose one time orally often works for Sarcoptes Mites, but two oral doses two weeks apart is preferable. For Demodex mites, use Amitraz dips because if you use Ivermectin for Demodex you have to give it every day, or every other day, for months—not always practical—and cure of the more difficult Demodex mites is less likely with Ivermectin compared to Amitraz dips. Note: for cats Lime Sulphur dip is preferable to using Ivermectin for Demodex Mites/Mange because cats have difficulty metabolizing many oral or injected medicines. Fortunately, cats don’t seem to get as rundown or sick or mite-infested as dogs probably because cats still know how to hunt, thereby obtaining the protein that dogs in poor countries often don’t get, leading to nutritional deficiencies and immune suppression. The number one cause of immune suppression on the planet—in dogs, cats and humans—is poor nutrition. It is not hard to Acquire a Deficiency in an Immune System if one is eating very poorly, or not at all.

If you have the other meds I’ve mentioned here, then give the antibiotic pills, prednisolone, antihistamine and worm pills to the dog with inflamed itching skin with patchy hair loss. You can crush/empty those tablets/capsules into the milk, except for the worm pills which are best given inside a piece of sausage, cheese or butter. Experiment to see which meds they will drink with the milk. Or you can ‘pill’ the dog by pushing the pill to the back of his throat (see index for page number for correct way to do this).

Ivermectin is truly one of the world’s great medicines—also used to cure and prevent river blindness in humans in Africa. Go to youtube, type ‘success River blindness Uganda Carter’ and watch this three minute video on river blindness in humans—the blindness isn’t even the worst part of this human disease that Ivermectin prevents. The worst part is the people cannot sleep because of the terrible itching. Note that the medicine they mention, Mectizan, is in fact Ivermectin. Ivermectin is considered an “Essential Medicine” by the World Health Organization. Once you see a suffering, hairless, inflamed, itching dog cured of its burrowing, biting, blood-sucking mites in just a few weeks with two oral doses of Ivermectin, you will see why this medicine is so great. So let’s give thanks to the soil bacteria that in the 1980’s was discovered making Ivermectin to protect itself, because *that* is how we learned about this great medicine. The 2015 Nobel Prize in Medicine and Physiology was awarded to the folks who first isolated this amazing medicine.

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Ivermectin is given by the World Health Organization (WHO), drug companies, and the Jimmy Carter Foundation to prevent River Blindness in humans in the tens of millions of doses in countries which have debilitating worm infestations that cause river blindness.

Ivermectin (5 cents worth) is also the active ingredient in Heartgard, the \$7 monthly pill you give your dog to prevent Heartworms. One drop of Ivermectin (5 cents worth) will kill as many as 16 million Heartworm 'babies' (microfilaria) that are circulating in your dog's blood stream before they can take up residence in the heart and becoming a large mass of 10 inch long worms.

Dogs with Sarcoptes mites only need two doses of Ivermectin given orally—in their food, or squirted directly in their mouths—at two week intervals to stop the terrible suffering of Sarcoptes mites, the tiny bugs that burrow under skin laying eggs and depositing feces where it enters the bloodstream causing infections and suffering with terrible non-stop itching. (No, you do not need to inject—see below for vet recommendations for giving orally). Cost for you to do it: about 20 cents which includes the cost of plastic syringes (NO needles because you give ORALLY). And there are reports of dogs being cured with only one dose, which is why if I see a stray I will give him that one dose because it is better than nothing and I may never see that stray again—though I always make an effort to find him again, especially since you will get to know their hangouts. Plus, Ivermectin kills some intestinal worms so I routinely give oral Ivermectin to just about every dog except collies and sheep dogs and their crosses because they are allergic to Ivermectin though they CAN handle the one **drop** per month to prevent heartworm.

The dogs you meet are only half the fun. You will also get to know the people in your community. But if you like dogs then you know how much love the dogs can give you in return for your affection and care. Go ahead, shut down your computer and unhook yourself from cable tv—get outside with your 'army-of-one' backpack, and soak up some of that fun and love that is just waiting to be had.

It was the wonderful **Roshan Dhunjibhoy** (deceased) in Chiang Mai, Thailand who helped launch me on this voyage of taking care of dogs and who showed me more than a few 'tricks' for administering to these dogs. Anyone wanting to learn about Roshan's amazing life can google her using her full name as I've spelled it above and you can see tributes to her here: <http://roshansiempre.wordpress.com/> or <http://www.lannadog.net/blog/wp-content/uploads/2011/06/Roshan-memory-booklet.pdf>

Meds & Conditions You Will Encounter

As an individual, I use my own money to care for the dogs in my village, and villagers contribute money, too, when they ask me to come to their homes to care for their dogs. In other words, most of us are not 'in it for the money.' So any donations you make to these people or groups helping dogs in poor countries will, usually, go directly to helping animals, not to funding air conditioned bureaucracies.

I knew none of the things in this manual when a dog came up behind me on a Thai beach on the island of Koh Samui years ago. I didn't know he was there, until I smelled something awful which made me turn around and see his eager face looking up at me. The smell was coming from his huge open sores

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on his body with hundreds of maggots eating him and it was his rotting flesh which I smelled. Using food, I tricked the dog into a bathroom and closed the door, and then I called Samui Dog Rescue and they came on their motorcycle with an attached dog cage and rescued him. That was the beginning of my journey. I ended up living hundreds of miles north of Samui Dog Rescue where I started my own little rescue operation in my village. Fortunately, you won't have to treat dogs with maggots very often, or ever. (Samui Dog Rescue is run by an amazing German woman, Brigitte, and her efforts at care and sterilization are herculean. See their website if you want to visit or intern there on a 'holiday' that could involve not just fun in the sun but fun in the sun while you learn and help).

Money units in this manual will be given in U.S. dollar terms and are approximate values only. I base these numbers on how much the medicine costs me in Thailand. Also note that I am buying medicines semi-wholesale, from a vet supplier, and not from the corner market. But remember that the corner pharmacy will sell you most of these medicines without a prescription and for much, much less than you could buy them for in the U.S.

I am not a veterinarian. You should consider verifying whatever I tell you with your local vet. In fact, it is a good idea to find a local vet to work with. There will be times when you will need his or her services. And the vets can help sell you medicines at a reduced cost if you tell them you are helping the homeless dogs. And if you find a wholesale distributor to buy from---they are even cheaper.

Regarding vets in Thailand & elsewhere: Make sure you are dealing with a real vet and not someone who only says he's a vet. A real vet should speak, read and write English, because medical texts are written in English and to be a doctor or a vet in a country like Thailand, you must read, write and speak English. If you see a 'vet' reusing the same needle, or who has a sloppy and dirty office, and who doesn't speak English, then know he isn't a real vet. In places like Thailand, you can call yourself a vet even if you haven't had a lot of training. If your funding permits, you can even hire your own full-time vet for as little as \$700 per month. Contact www.samuidog.org or <http://www.carefordogs.org/> for advice with this, as they hire their own Thai vets.

It is a good idea to make up a one or two page 'flyer' in the native language that you can duplicate at the copy shop which teaches the natives how to care for their dogs. The leaflet can contain the name, phone number and location of your local vet so that those needing his or her services will know where to go. By helping the vet increase his business you will earn his help when you need it. And it will help you make allies with the vets who can vouch for your good intentions if necessary.

It can help to take pictures with your digital camera of sick dogs whose diagnosis you are not sure of and then taking your laptop to the vet's office. The nearest vet to me is 50 km but if you have a vet close then you can just take the dog there, if that is convenient. The vet looks at the pictures and tells you what to do. This saves a lot of hassle trying to bring the dog into the vet. You can show many pictures of many dogs to the vet, not just one dog. Often the vets in countries like Thailand will give you a picture diagnosis for free, charge no money for this, even if you try and pay them. I always tell the vet that I tell everyone in my town to go to him. This way I help him build his business and he feels good about helping the homeless dogs and he often gives me a discount. In the beginning you will

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probably be showing pictures to your vet a fair amount, but later you will learn what to give the dog. But sometimes pictures aren't enough and I use the mesh dog cages in the back of my truck to haul dogs to the vet.

Skin Diseases of Dogs and Cats (book) A Guide for Pet Owners and Professionals by Dr Steven A. Melman, DVM. This is a very good book and you can find used copies on the internet for a couple of dollars.

The handful of medicines you need to fix the sick, mangy, rundown dogs—these medicines cost very little money and are easy to get without a prescription. Ivermectin is the medicine for **Sarcoptes** mites—the kind you will see most often—are the bugs that cause terrible itching, hair loss, red, infected skin. Ivermectin costs about \$10 for a 100 ml in Thailand and approximately \$25 in the U.S. This is enough medicine to treat as many as 50 (or more, depending on size) dogs. That's as little as 20 cents to kill the mites and stop the suffering of one dog.

Some dogs have another kind of mite, **Demodex**, and may need Ivermectin every day (or every other day) for 2 months. But there are other ways to treat Demodex mites that don't involve giving Ivermectin every day. One way is dipping the dog in Amitraz ('Mitoban', 'Tactic' 'Ekto-tak') every week or every two weeks for 6-12 weeks (every week is better). Amitraz is the only method approved by the US FDA. It is the 'gold standard' for treating Demodex in dogs. Sponging on Amitraz every week or two weeks is easier than giving Ivermectin every day for Demodex mange/mites, and is more effective than Ivermectin in cases of Demodex. Before you sponge it on, give the dog a bath and apply Benzoyl Peroxide along with the shampoo, and leave both on for 10 minutes while you 'massage' the skin before rinsing off. The Benzoyl Peroxide allows for much better penetration of the Amitraz. **Mix 10.6ml of Amitraz in TWO GALLONS of water.** Wear gloves. Avoid the eyes and have a bottle of water ready to rinse the eyes if you get the amitraz in their eyes. Sponge it on the entire body of the animal, avoiding the eyes; do not rinse the Amitraz off the dog; do not towel dry; let it dry on the skin. If the dog has Demodex mite scarring next to the eyes then you can put some petrolatum (such as Vaseline petroleum jelly), or you can use some other eye ointment that has a petrolatum/thick texture, and put some directly on his eyes. This will help protect his eyes if you spill the amitraz in his eyes. If you are using the pour-on (dip) method of applying Amitraz to his entire body, then do not pour on amitraz near his eyes. Use a sponge and squeeze the sponge so that it is not dripping so that you can use this wet (but not dripping) sponge to apply around his eyes.

This is another reason why it is helpful to have a vet you can show your digital pictures to—the vet can tell you what kind of mites you are dealing with if you aren't sure. Usually, dogs with intense and almost non-stop itching, inflamed skin with patchy hair loss have Sarcoptes mange which only requires two oral treatments of Ivermectin. Dogs with blackened, thickened skin but little or no itching have Demodex mange, which takes more than 2 oral doses of Ivermectin. Fortunately, most dogs you will treat will have the Sarcoptes, which is easy to fix. But you can always start with the two treatments of Ivermectin at two week intervals and observe. If the dog improves, it was probably Sarcoptes mites. If it doesn't improve then you use Amitraz dips. If he doesn't improve after a couple of Amitraz dips then

consider giving antifungal meds. Because Sarcoptes mites are contagious from dog to dog I often treat the other dogs he's around with the same two doses of Ivermectin.

Antibiotics are also cheap. A dog with mild infection, some scabs, red skin may need antibiotics for a week or two. **Cephalexin** (a preferred antibiotic for skin infections) 500 mg capsules cost about 10 cents each. The dose is approximately 25mg/kg (25 milligrams of medicine per kilogram dog's body weight), by mouth (po, 'Per Os' in doctor language means 'by mouth'), twice a day ('BID' twice per day). So a 10kg dog would need 10 x 25mg = 250 mg in the morning and 250 mg at night---half a 500 mg pill in A.M and the other half at night. The antibiotic **Amoxicillin** is much cheaper and I use it with great success when I don't have Cephalexin.

Often, however, I cannot give the medicine twice a day, and the dog only gets it once per day. If I can only give it once per day, then I give a slightly higher dose. But it is not a good idea to only give once per day. Still, I am often 'forced' to do it and I have cured many dogs with only once-daily dosing.

So a 10 kg dog would need a few cents worth of **Cephalexin or amoxicillin** per day. It is always a good idea to give antibiotics until the infection clears up and then keep giving it for one or two more weeks. Said another way, give the antibiotics one or two weeks past clinical cure. But, like I said, it isn't often possible for you to give antibiotics for this long, so give what you can for as long as you can up to the recommended time-frame. I've seen dogs cured with far less than the recommended treatment. Giving baths can help immensely. It is helpful to put antibiotic creams or liquids directly on the wounds he's made by scratching. I often use Iodine for this purpose...but don't use topical iodine day after day after day. A little topical iodine occasionally is good, but too much for too long is not so good. Always clean the wounds first, however. Putting antibiotics on top of a dirty wound is no substitute for cleaning the wound. Use clean water with salt added to it; taste the water first so that it no more salty than tears or sweat, i.e, very lightly salted. Or use just plain clean water if that is all you have. Get all dirt particles, etc out of the wound. Apply hydrogen peroxide (3% NOT 6%), and apply iodine and/or antibiotic ointment.

The main bugs you will be battling are:

mites

fleas

ticks

Bacteria-- (including bacteria from mites (mange) and mite feces & eggs deposited under the skin)

Yeast (fungus)

Intestinal Worms

The medicines you need for this are (in a loose order of importance and frequency of use):

Ivermectin for Mites 10 cents per cc

Antibiotics for Bacteria (**Cephalexin** is very good antibiotic) 12 cents per 500 mg. **Amoxicillin** costs less than this but cephalixin is superior, so use it when you can especially for skin infections resulting from

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mites, etc. 21 days of **doxycycline** for dogs who have had a heavy tick burden. **Doxycycline** is the premier antibiotic for killing the deadly tick-borne pathogens, including Lyme disease in humans. A 100 mg tablet costs a couple of U.S. cents in Thailand. After 3 or 4 days of antibiotics dog will look better but do not stop giving the antibiotic just because dog appears better. This is a big mistake that people make with themselves, too, that is, they don't finish all their meds. Not giving the meds for the proper time can cause treatment failures and drug resistance.

Flea/tick medicine (Fipronil, Permethrin, Methoprene) 2cc for 20-40kg dog applied to neck area kills fleas/ticks for a month. Cost about \$1.50. This is probably your most expensive medicine but it is a very important one, especially for a dog that is sick since those dogs need every bit of help they can get. Flea/tick powder is very useful, and less expensive than the liquid pour-on-shoulders. **Flea/tick powder** can provide rapid 'knock-down' power of many ticks and fleas—because they crawl in the powder and carry some back to where other ticks/fleas live, plus it kills fast, rather than the pour-on-liquid which requires the flea/tick to bite the dog first. But with serious flea/tick problems I would put both on dog, using the powder sparingly. A bottle of powder can be used by a poor person for, say, once a week and the bottle will last months. It is more affordable than the liquid. I sprinkle it on the dog from the base of the neck/shoulders down the spine to the tail area and rub it into hair, unless the dog is covered in ticks, in which case I put it all over their body, avoiding the eyes/mouth. In Thailand, I observed no fleas on dogs who slept on piles of dry sand. The other temple dogs who slept within thirty meters, but not on sand, had many fleas. I learned recently that a scientist discovered a chemical in ocean sand that he believes repels or kills fleas and I believe he is at work on bringing this to market. It is possible that the sand I observed had this chemical in it. But I believe that loose, dry sand (without the chemical) may be inimical to fleas since they could get harmed when they jump off the dog into the dry sand, which may harm them by removing moisture from their bodies. I don't believe the dogs chose to sleep on the sand by accident. There were of course many other places to sleep around the Temple, but they were usually on the sand when they were sleeping or relaxing. And to find any dog in Thailand without fleas is a rarity, unless they are being given flea-control products.

You will find **tick/flea powders** made from pyrethrins and/or permethrin or 'regular' flea/tick powder whose ingredient is either a carbamate or organophosphate insecticide. I carry a bottle of each. I like the carbamate/organophosphate powders because they can deliver rapid knock-down of large infestations. I like the pyrethrin/permethrins because they kill and also *repeel* fleas, ticks and even mosquitos and is much less toxic to dogs. *"Permethrin is a common insecticide that is found in dog flea prevention products. It can easily be confused with pyrethrin which is in most flea prevention products for cats. **Permethrin** is a stronger form of pyrethrin and **can be toxic to cats** because of its high levels. Flea products that contain **permethrin are labeled "for dogs only" and should never be used on a cat.** If you have a cat and a dog, it is important that direct contact between the two be limited after the dog is treated".(vetinfo.com)*

so: **Permethrin okay for dogs, but toxic to cats.** *Pyrethrins okay for cats.)*

Worm tablets (often contain the three ingredients Praziquantel, Pyrantel, Febentel) Cost: about 50 cents to deworm a 10 kg dog and a dollar to de-worm a 20 kg dog in Thailand. The tablets are

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packaged individually and are for both dogs and cats and each pill wrapping says “1 tablet for each 10 kilograms”, which means you give one tablet to a dog or cat that weighs less than or equal to 10kg. If your medicine isn’t labeled like that then you need to look up the dosages for each of the ingredients you have and give the correct amount. Note that the mite medicine, Ivermectin, kills some kinds of intestinal worms, too. But there are some it won’t kill that the Praziquantel etc will kill. Because I give Ivermectin to practically every dog I deal with I know that some of the worm species will be killed. In fact, if you only have time and money to do two things for the dog make those two things: 1) oral **Ivermectin** and 2) oral pills for **worms**. Those two things will solve most of the dog’s problems! If you also pour on the back of his neck some flea medicine, or dust him with **flea/tick powder** then you have done the three most important things for that dog: 1) oral ivermectin 2) oral worm pills and 3) flea/tick medicine. As my Thai vet said when I asked him “Aren’t you going to test for worms before you give him worm medicine?” and he answered by saying “All dogs have worms until proven otherwise”. He never performed expensive fecal tests because 1) tests can miss the eggs/worms 2) tests are expensive and 3) medicine for worms is not harmful and is cheap in Thailand. If the dog is really sick, then give the worm tablets and repeat in two weeks to make sure you kill any surviving worms. He also recommends deworming dogs regularly, as often as every 3 to 6 months.

Antihistamine Chlorpheniramine or **diphenhydramine** (‘Benadryl’), for itching and allergic reactions; Benadryl/diphenhydramine is especially good for human allergic reactions where antihistamines can be lifesaving. For example, if I am treating a dog with mange, red or bloody skin, loss of hair and itching I ‘automatically give:

- 1) Ivermectin oral
- 2) worm pills oral
- 3) prednisolone oral and
- 4) antihistamine chlorpheniramine or diphenhydramine (‘Benadryl’), oral and
- 5) cephalaxin or amoxicillin oral
- 6) flea/tick medicine or **flea/tick powder** (but only if skin barrier is intact. Do not pour on wounds.)
- 7) food with soybean oil added to it (see elsewhere why SOYbean oil is essential).

prednisolone 2mg/kg/day;(or 0.22 mg/kg/day for dexamethasone). **Prednisolone** a **steroid hormone**—will help lower inflammation of bowel and increase their appetite if they have diarrhea. A dog that is really sick, or wounded, or who has been in an accident needs steroids! Dr. Jeffries, MD wrote the great book, “The Safe Uses of Cortisol” and he demonstrates how low or moderate doses of prednisolone or dexamethasone or hydrocortisone (cortisol) can greatly speed recovery in a human patient who is under great stress (**infection, itching, inflamed skin, accident, surgery, cancer** etc). This goes for dogs, too. Except do NOT give these hormones long-term to a dog with Demodex mange because dog with demodex is usually not itching and because steroids can further suppress their immune system making Demodex worse. But if Demodex dog has terrible itching for any other reason then okay to give it short-term. Fortunately, most dogs you see will not have demodex but will have sarcoptes mange instead. Most importantly: always give (unless they have demodex) prednisolone (steroid hormone) along with an **antihistamine (chlorpheniramine or diphenhydramine (‘Benadryl’)**, to any dog that has reddened inflamed skin who is itching/scratching a lot or to a dog with maggots, who will also be scratching a lot--you must stop them scratching the wounds and

making the wounds worse. You will only need to give the prednisolone and antihistamine for a few days or so, because the Ivermectin will quickly start to kill the mites or maggots which are causing the itching.

In fact, this itching and scratching is usually a hallmark of Sarcoptes mange where you CAN and should use prednisolone for a few days. His itching will stop within a few days after the Ivermectin starts killing the mites. If you see a hairless dog who is NOT itching then it is more likely he has Demodex mange where you do NOT want to use prednisolone long-term. Short-term use of prednisolone okay if Demodex dog is itching terribly for any other reason (wound, maggots).

Dexamethasone for pregnancy termination: note that a ten day course of dexamethasone, 0.2 mg/kg, po (oral), BID (2x/day) will terminate a pregnancy in a dog or cat. But if you start the treatment too late in the pregnancy you **run the risk of killing the mother** so ONLY attempt this under the supervision of a veterinarian. It is much better to spend your time and energy and money to spay and neuter.

Dexamethasone for shock or serious trauma, such as car accident, etc. It is possible that when you treat a dog with Ivermectin, the millions of microfilaria (baby heartworms) dying can cause a dangerous allergic shock in the dog. *“The following symptoms may develop about 5 hours after treatment: pale mucosa, tachypnea (rapid breathing), dyspnea (difficult breathing), vomiting, weak and accelerated pulse, weakness, fever and ataxia (uncoordinated movements). Therapy requires shock treatment, including administration of corticosteroids (prednisolone, dexamethasone) and fluid supply”*. (see Ivermectin discussion toward end of this manual). If in shock and cannot drink and you don't have IV salt water then give many ccs of homemade Gatorade along with the crushed-tablets dexamethasone rectally using a syringe with no needle—see discussion on Rehydration elsewhere in this manual). If you have liquid injectable dexamethasone, then inject the correct dosage SC/SQ (subcutaneously) or IV. Injecting SC is easy, just pull the skin on the back of his neck up in a ‘tent’ shape and inject there.

Itraconazole, anti-fungal med. Itraconazole is preferable to ketoconazole, because ketoconazole can sometimes suppress the adrenal glands and possibly harm the liver, but most docs still use ketoconazole because it works and it is much less expensive. I have used it many times. Look on Google images for pictures of dogs with dermatophytosis (‘ringworm’, which is not a worm), so you can learn to diagnose this. Griseofulvin is a good antifungal drug for ringworm (dermatophytosis). I have also used itraconazole in dogs with nasty, oozing-puss wounds on and/or inside nose, who had loud ‘liquid’ labored breathing/sneezing after a course of antibiotics did not clear it up. If you are not sure, then check with your vet first before giving an antifungal med. In addition to giving ketoconazole or Itraconazole (or griseofulvin for ‘ringworm’) you can bathe the dog using shampoos with any of the following: ketoconazole, salicylic acid, sulfur, neem, coal tar, benzoyl peroxide. And you can then treat with Lyme Sulfur ‘dip’ (non-toxic, see directions elsewhere here). But for a fungal infection deep inside the nose, you need to give Itraconazole or voriconazole. But these oral drugs may not be enough to eliminate the fungus in the nose. You may need to take the dog to a vet where he will sedate the dog and ‘bathe’ the inside of the nose in antifungal meds. Note that the fungal infection, Aspergillosis can be inside the nose but cause necrosing cutaneous lesions/crusts on top of the nose and sinuses. This is

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actually a 'common' but under-diagnosed problem in animals in countries with dirty (fungal) water. Have a high index of suspicion if you hear 'sneezing' and bloody discharge from nose (epistaxis).

Metronidazole (Flagyl) for stopping diarrhea caused by giardia. Before giving metronidazole you can try activated charcoal, yogurt or acidophilus pills or probiotic pills— which can greatly help with diarrhea in both humans & dogs. Many dogs (and people, too) can develop diarrhea from dirty water. Metronidazole: 25 mg/kg PO BID for five days is effective in 65% of dogs. In Thailand, you can buy 4 pills of Metronidazole 200 mg for one U.S. cent. PLUS also give prednisolone for diarrhea in addition to metronidazole, yogurt, acidophilus etc). **Rather than giving Metronidazole**, however, a better way to deal with persistent diarrhea that may have come from dirty water and giardia is to **give the dog a one-time double dose of the worm tablets**, which contain pyrantel, febentel and praziquantel. This has been found to be very effective and it has the added benefit of killing other intestinal parasites. Plus you only give it once and it has fewer side effects than metronidazole.

Metronidazole can have more than a few serious adverse effects in a dog, so I recommend you avoid using this drug, unless under the supervision of a real veterinarian. If dog has frequent diarrhea you must rehydrate him using ORS. See directions elsewhere. With massive diarrhea, dogs—and humans--will be dead in a few days if only given medicine. They must be rehydrated using electrolytes (see ORS discussion elsewhere).

Vincristine. For genital tumors (TVT) in dogs. (Vincristine comes from the periwinkle plant, and vincristine costs about \$10 a bottle in Thailand but maybe \$500 or a \$1000 in the West where it is used especially in childhood leukemia). Let the vet administer this one, as it needs to be done IV unless you are confident you can do it—I learned by watching my vet and the internet and trial and error. You can do it. Occasionally you will see a female dog with a swollen, hard vagina that can be oozing blood or have red **cauliflower-like tumors** visible in the opening; or a male dog with red, crusty, bumpy tumors on its penis. This condition can be **Transmissible Venereal Tumor (TVT)**. The dog needs a medicine called Vincristine administered IV— once per week for 3-6 weeks, but sometimes just one time will do it. Because these tumors can be transmitted from one dog to another by sniffing, touch, sex, it is important to treat them, especially since they can be very painful. A 10 kg dog will need, for each treatment, 0.3 mg of Vincristine IV (zero point three, i.e. a third of a cc/ml). A one mg bottle of Vincristine in Thailand costs \$10 (U.S.) so if the dog weighs 10 kg that one bottle may be enough to fix them since she/he would need 1/3mg (0.3 cc) of that bottle per week for 3 weeks (or longer, but usually 3 weeks will do the trick.) A 20kg dog needs 0.6mg per dose. But remember that the dog you are treating may be extremely thin for his size and so you may need to give a bit more than the above doses because these doses are calculated on his Body Surface Area (BSA), and a very thin dog will have a larger BSA than his weight would indicate. So if the dog 'should' weigh 20 kg but is only 15 kg, then still give him the 20kg dose.

The most suffering I ever saw on a dog in Thailand was TVT on the penis such that, because there were bumpy 'cauliflower-like' tumors on his penis, it could not retract into his sheath and he was in constant, terrible pain—howling in agony—and could not sleep. A few visits to the vet and IV vincristine fixed that—but it wasn't easy getting him to the vet! He didn't want to be 'caught' so we

had to feed him acepromazine hidden in sausages to knock him out. The bus drivers at the bus station where he lived helped me catch him and they even pitched in some money for his treatment.

But if you don't have experience putting medicine into a dog's vein (IV) then you need to take that dog to the vet and have the vet do it. It can be difficult to do if you don't have experience injecting into veins so this job is best left to the vet. Plus the vet has an assistant to hold the dog and I believe the act of having the dog off the ground and on a table 'calms' the dog. Also noteworthy is Vincristine—a potent chemotherapy drug—must be handled with extreme caution, gloves and glasses worn, because if the medicine contacts your skin or eyes it can cause a big sore and if you attempt it IV and you aren't in fact in the vein then you will be injecting it under his skin—not IN his vein—and the medicine will cause problems.

I learned how to inject Vincristine one night by myself on the side of the road using a headlamp and it was difficult and stressful and took me a long time to hit the vein. (But I've gotten much better since then). A vet can do it in under 30 seconds with an assistant who squeezes the leg to make the vein visible. Another reason a vet can be more efficient is because the dog is on a table—off the floor—and this somehow calms the dog. But if you are motivated you can learn to do it, as I did. The more you do it, the easier it becomes. Since my vet is so far away, and expensive, I opt to do it myself. What a wonderful sight it is, to see these weird 'alien' cauliflower tumors just melt away from their genitals. ('Alien' because TVT is one of only 3 or 4 cancers that do not contain the DNA of the person or animal).

Often the secondary infections caused by having TVT benefit from a strong antibiotic such as injectable Ceftriaxone, which I can buy in Thailand for one dollar per cc, and one cc is good for two doses for a 10kg dog. A fantastic price for this amazing medicine. The directions that come with it say give it IM, IntraMuscularly. BUT, this is very painful to the dog, they do not like it, they can try and pull away, maybe breaking the needle. So one option, that I used for a while, is to mix (reconstitute) the powdered Ceftriaxone with 50%water and 50% lidocaine. And then I would give this IM. But then I read in the great book, Plumb's Veterinary Drug Handbook, that SC/SQ (subcutaneous) is fine. (IM has higher peak values, but SC has longer bio-availability—and so, for both meds, the 'area under the curve is the same'.

If the dogs have infections then I give them antibiotics--amoxicillin or cephalixin. Cephalixin is often preferred for deep skin infections and urinary tract infections, but amoxicillin (cheaper) works well in most situations. Females with pyometra (vaginal discharge and very ill, distended abdomen---see discussion elsewhere--you can start with these two oral antibiotics if they are all you have but she needs Ceftriaxone injections daily and she needs to go the vet. If dog has been 'covered' in ticks then I would give Doxycycline and metronidazole together for a week, then give continue doxycycline for 3 more weeks. This is because some of the organisms such as **Lyme disease** that ticks harbor can change form from parasite to cyst and doxycycline kills the parasite form and metronidazole kills the cyst form. I actually used this protocol on myself (for six weeks) when I found (while living in the U.S.) the red bulls eye rash on my shoulder, the characteristic rash of tick-born Lyme disease. I was lucky to find it because it meant I had caught the disease in an early stage that was easy to kill. Most people with chronic Lyme disease either never got the rash or didn't notice it, thereby allowing the organism to

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‘take up residence’ in their bodies. And this is why it is a good idea to frequently check yourself for ticks, and pull off (with tweezers at base of head—do not squeeze the body). If you think the tick has been on longer than 24 hours you want to consider doing a course of doxycycline and metronidazole for yourself. If you see the rash, then roll on some DMSO (look it up on Wikipedia) and then open a capsule (or crush a tablet) of doxycycline and sprinkle that on the rash. The Lyme bacteria are right under the skin at this point, massing for attack. You can ‘bomb’ them directly with this DMSO method, which I thought I had discovered on my own. But it turns out another doctor(s) is already using it and on pubmed.org you can see the studies which prove this topical method kills efficiently the Lyme bacteria which, if left untreated, will burrow their way deep into the body making it much more difficult to eradicate. See more info at end of manual (check index for page number).

If you had to carry just one thing with you then it would be Ivermectin to give orally to dogs with itching, red inflamed skin, hair falling out in patches and give it also to other dogs in contact with the infected dog because they, too, will probably have Sarcoptes mites. Some ‘top meds to carry are:

Ivermectin oral for mites;

flea and tick control pour-on liquid if not too expensive. **Pour on shoulder blades 1x/month.**

flea/tick/lice powder (permethrin/pyrethrin and/or carbamate-based)

oral worm pills

Amoxicillin &/or cephalexin &/or clindamycin given orally for infections, wounds.

Iodine topical for cuts and wounds.

Activated Charcoal tablets/capsules for suspected poisonings of dogs or humans.

Fleas can cause a great deal of suffering and harm especially in dogs that are allergic to them. If you only count 20 fleas on a dog be assured that the dog really has perhaps 500 or 1,000 fleas living off of it. Most of the dog’s fleas are not on the dog when you look. They only hop on when they are hungry, so a dog may be getting bitten as many as hundreds of times per day by hundreds of fleas. Some dogs are much more sensitive to flea bites than other dogs and just one or two bites can cause a problem.

Many pet owners make the mistake of thinking their dog has no fleas if they see no fleas on the dog. But often the dog will groom itself (eat the fleas) so well that you won’t see any fleas at all. Eating fleas is yet another way a dog acquires worms. Remember, when you see 10 fleas on one dog that means there are really several hundred feeding on him, as they take turns feeding throughout the day. Dogs can have lots of fleas even if the owners never see them, especially if the owners bathe the dog frequently, washing away the telltale flea ‘dirt’ (feces). Ticks are the same way: the ticks you see on the dog are only the ones that are there at that moment. If you just pick those off (using tweezers only, Not your fingers), there will be 10 or 50 more on the dog soon thereafter. And this is why the powder products can be so helpful.

The 2 cc of flea medicine costs one dollar in Thailand compared to multiple dollars in the U.S. One application on the skin of the neck at the back of the head—after you’ve pulled hair back—or even cut a small patch of hair so you really expose the skin so the hair shafts don’t act like a ‘sponge’ and soak up the expensive medicine will kill fleas and ticks for a month or two. And it will even help other dogs that live around the dog since that dog will now be killing many fleas and ticks. The powders provide

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rapid 'knock down' power because fleas and ticks carry some back to 'nests' thereby killing more. So if you are treating a group of dogs who have fleas and ticks then it is a good idea to start with the powder insecticides, so you can rapidly stop the sustained attacks on the dogs. The powders that are made from permethrin/pyrethrin not only kill they also repel, including even mosquitos, so what happens is the fleas and ticks may crawl on, but they don't bite, as they are now repelled, but they leave the dog with a bit of powder on them. The once-per-month pour-on-the-skin-on-the-shoulder-blades liquid will kill for up to a month but the insects must bite the animal first. The pyrethrins are naturally derived from Chrysanthemums. Permethrin are also used to impregnate mosquito nets in malaria areas so that the mosquitos are even less likely to make it on the other side of the net since they are repelled by pyrethrins. Even though pyrethrins are among the safest insecticides, it is still a good idea to wear gloves or wash your hands after applying these powders or liquids. If you are applying a carbamate or organophosphate based insecticide, then definitely wash your hands afterwards. Permethrins are the active ingredient in the topical Nix for humans to kill lice and scabies.

The other item you will want in your backpack is some **surgical gloves**. I personally like to touch my dog friends with my bare hands but I will wear surgical gloves when necessary, especially if I have a cut or scratches on my hand where dog saliva can enter. It is a good idea to wear keep your fingernails extremely short and wash with water and soap and take a shower and change your clothes before you sit on your couch lay on your bed, etc if you have been around dogs in the field for a few hours of sitting and kneeling on the ground to help them. This protocol isn't so important when you're around well-cared for, non-itching dogs in the West (or wherever), but in poor countries many dogs will have mites, etc that you want to be mindful of because you can bring those mites home with you. Surgical gloves are a good idea for many reasons, not the least of which is remembering that **Rabies is carried in the saliva of a rabid dog or cat**, so it is best to avoid the saliva of dogs. If you have an open cut or wound on your hand then wearing gloves is absolutely essential. But, in my years of treating dogs in Thailand, my un-gloved hands were often exposed to dog saliva unless I had a cut then I did for sure wear gloves, even though I've had the rabies shots; and I frequently washed or rinsed my hands.

I don't recommend going without gloves but I admit I still will often touch the dogs with my bare hands if I don't have any cuts or scratches on my hands (where rabies in saliva can enter). But I did this because 1) I was careful and 2) I was vaccinated against rabies and 3) I washed and/or rinsed my hands frequently. So I definitely recommend you go to the local hospital and get the prophylactic vaccinations for rabies (see end of manual for correct vaccine schedule. Put a cold pack on injection site immediately after injection for two hours, to reduce harmful brain inflammation, and also, before and after vaccinations take 5,000 IU Vitamin D3 orally daily along with 2 magnesium tablets per day, every day; this also powerfully protects against the side-effects of the vaccination and protects against many other things as well. Taking 2000-5000 IU per day of Vitamin D and taking a magnesium supplement, year round, is good for overall health of humans, regardless if one is sick, because most people are woefully deficient in these two essential nutrients. ("Vitamin D for Health: A Global Perspective" Mayo Clinic Proc. July 2013). 2000 IU sounds like a high dose, but it is only 40 MICROgrams (millionths of a gram).

There is a lot of **Rabies** in third world countries. The **vaccinations for humans are cheap in the developing world** if you don't go to a tourist-trap clinic, but they can cost hundreds of dollars or more in the United States. At a hospital in a developing country outside the tourist areas-- maybe 5 or 10 dollars per vaccination shot. If you have been previously vaccinated with the required 3 vaccination shots over three or four weeks, and you are later bitten, then the doctor SHOULD give you only two post-exposure vaccination shots spaced three days apart, which are inexpensive. But if you've not been previously vaccinated, and you are subsequently bitten, then you will need expensive Rabies immune globulin (RIG) PLUS 4 vaccination shots over a two week period. The vaccines are given in the arm and the rabies immune globulin (RIG) —if you need it—is given near the bite wounds. Make sure you print out this correct info (especially that info at the end of this manual that is from the Merck Manual Professional Edition) and take it to hospital with you because, if you've already received the prophylactic vaccinations, the hospital or clinic often wants to give you more injections than necessary. Repeat: **if you have already received the PRE-exposure prophylaxis of 3 shots Before you are bitten, Then you will Only need TWO post-exposure vaccinations**. Not 3, not 4, not 5. Only two. I have had doctors insist I needed to get the full 3 or 4 or 5, even though I already had the pre-exposure prophylaxis of 3 shots. These doctors are only remembering half of their training. All they have to do is look up the protocol. And you will not need the expensive rabies immune globulin (RIG), either. Someone, however, who has not received the Pre-exposure 3-shot pre-exposure prophylaxis, will need 4 vaccinations Plus the expensive rabies immune globulin (RIG). In all cases, immediately after being bitten, before you go to a hospital wash the wound thoroughly with soap and water for 10 minutes, and apply some iodine and hydrogen peroxide to kill other pathogens. Many times I was bitten and did not go to the hospital for post-exposure shots because I had already received pre-exposure shots, **And** I had reason to believe the dog did not have rabies, **and** I kept an eye on the dog daily for next two weeks to see if he developed any signs of rabies. See material at end of manual on signs of rabies. But if you've never received any vaccinations, and you are bitten, then just thank that dog for the wake-up call to get you to go get the vaccines which you need anyway if you are working around dogs in a poor country where there definitely is rabies.

If the dog was acting strangely (for example, bit you for no reason), or, even if not acting strangely, but still bit you and then the dog ran off whereabouts unknown...then you will definitely want the Rabies immune globulin (RIG) on top of the vaccines if you were not previously vaccinated before the bite. That one shot (Rabies immune globulin (RIG), which is different from the vaccines you also need) could cost several hundred dollars even in a poor country, but it is worth it. (Now you see why it is a good idea to get vaccinated Before you start working around dogs? Because you will be much better protected and you will not need to get the expensive Rabies Immune globulin (RIG) shot if you are subsequently bitten...you will only need two inexpensive rabies vaccine shots on days 0 and 3 (day of bite and then 3 days after that).

And, the fact is, in countries like Thailand where there is a lot of rabies, if you are exposed to the saliva of many dogs, you do really want the 3-shot prophylactic series. I am an opponent of too many vaccines now being given to kids and everyone, that is, I am opposed to Over-vaccination. But if you are working with dogs in poor countries, I strongly urge you to get the 3 shot series of Pre-exposure prophylaxis.

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And, most important, if you are bitten, wash the wound immediately. Wash it for 15 minutes. Wash it with soap & water, iodine, then more soap and water, then iodine, then some hydrogen peroxide, then alcohol, then more soap and water, scrub well, more soap and water---15 minutes—then more hydrogen peroxide and betadine-iodine (povidone iodine). See other info on rabies elsewhere here for detailed protocols on vaccinations, etc. Immediately after being bitten, washing the wound for at least 10 minutes with soap and water will remove many virus particles if the animal has rabies. Applying some iodine and hydrogen peroxide will kill other pathogens. Rabies is a slow moving virus and washing the wound like this is much, much more important than rushing to the hospital when bitten because a rabies bite is not a medical emergency, unless one—especially a child—is bitten on the face and/or neck, in which case you still want to wash the wound before rushing to the hospital. At the hospital, you should make sure that in addition to injections you or the hospital staff washes the wound some more. **Never rely on vaccinations alone to protect you from rabies.** Yet no one—even those previously unvaccinated--- who has received prompt post-exposure treatment has ever died from rabies.

Interacting with the locals

Many of the dogs I treat belong to the poor (and some middle-class) Thais in my small town. I have an info sheet explaining that I only charge them for the cost of the medicine, and not for my time, and that I buy the medicine at a big discount and pass the discount on to them. The info sheet explains—in Thai language—that I make no profit. And it gives them an idea of how much it will cost to treat a dog. About 20 cents for mild case of *Sarcoptes mangle* (mites). If dog has mild infection then he needs Cephalexin 500 mg—for example—every day for two weeks and this will cost 5 cents a day x 14 days= 70 cents (or if amoxicillin then much cheaper). And the info sheet explains about the 75 cents of flea medicine for a 10 kg dog (\$1.50 for 20kg and up) that will kill fleas for a month or longer.

Sometimes Thais will come up to me wanting a handful of dog food to take home to their dog. I always say ‘no’ because once you open this floodgate then everyone will expect free food. I tell them that—and my printed ‘information sheet explains—that if they feed their dog some rice with a little meat, fish, pork, chicken and soybean oil—that that is not only better food than my dry dog food, but cheaper, too. Which is true, rice and chicken is cheaper than dry dog food from a sack. So if your budget doesn’t allow buying sacks of dry dog food, you can always cook up a bunch of rice and throw some pieces of lightly cooked chicken in the hot rice and add some vegetable oil and salt.

I know the pet food industry has invested a lot of propaganda about the ‘dangers’ of **feeding ‘table scraps.’** But it is just that, propaganda. Somehow they have turned the term ‘leftover food’ into the menacing sounding term ‘scraps.’ Leftovers are good enough for me to eat and I assure you they are good enough for dogs to eat. Dry dog food is mostly soy and corn anyway. Don’t tell me soy and corn is better for a dog than real meat and rice. But I do use dry dog food—hundreds of kilos of it—because it is convenient and because it is often much higher quality food than some of these starving dogs are getting. And dry dog food has vitamins, minerals and other things in it that home cooked rice and chicken doesn’t have.

So if you are going to give real meat and real rice, butter, etc to your dog, make sure you also give him some commercial dog food because if you don't there is a good chance you can create vitamin, mineral and other nutritional deficiencies long term if you only feed home-cooked food. I give some 'real' food to my dogs in the USA every day but not so much that they don't also want to eat a high quality dry dog food. Interestingly, I have found my dog much prefers organic dog food to other expensive, high-quality dry dog food brands. This echoes experiments done with baby pigs who were given a choice of organic vs inorganic food. The theory is the pigs can smell one of the breakdown products (formaldehyde) in the non-organic food which is 'saturated' with RoundUp, the toxic-to-humans weedkiller that is now found in soy, corn, wheat, and other crops. (go to youtube search window and type 'Stephanie RoundUp' and listen to M.I.T. senior researcher, Dr Stephanie Seneff explain all this).

There are, however, some people foods **dogs should not eat: chocolate, raisins, avocados, onions** (in excess), **garlic** (in excess), **macadamia nuts**, and **xylitol**. **Xylitol** is a sugar found in **candies, ice cream, chewing gum, liquid vitamins**, etc. **A little bit of xylitol can cause life-threatening hypoglycemia** (low blood sugar) in a dog, causing seizures, coma and death. Which is why I won't eat any products with xylitol in them, even though "they" claim it is safe for humans. If you have to treat a dog with this problem, then you need to put a sugary syrup (mix sugar with a little water) under his tongue if he is unconscious and keep doing that, unless, of course, you have a vet who can give glucose IV (intravenous, in the vein). If he is not unconscious and he can drink then make the Oral Rehydration Solution (ORS) with chicken soup described elsewhere but use much more sugar than the regular recipe, because a **xylitol poisoned dog will have profoundly low blood sugar**.

When I come across an especially run-down dog—say, one with no hair, and has scabs and perhaps 'elephant skin' (skin thickened through years of mites, bacterial, fungal and other damage)—I will supplement the dry food I give him with beef or chicken, cooked or uncooked. If the dog is extremely sick and seems to not to want to eat I always rely on the reliable homemade chicken soup with salt and rice. (Do not let anyone cook it with MSG (monosodium glutamate) , "pon chu rhot" or "roht dee" in Thai language.) Simple chicken soup like this--salt, water, chicken, rice--can revive almost any animal. If you can't put rice in the soup, then be sure and add a little table sugar because a truly sick animal is probably very dehydrated and in order to get the salt into the body sugar must be present in the intestine at the same time--the 'sodium-glucose co-transport system'. This salt-sugar **Oral Rehydration Solution (ORS)** applies to dehydrated humans, too, especially if they have fluid loss from diarrhea, vomiting or bleeding. And if the dog seems depressed and lethargic or has any other symptoms of poisoning then I open 20 or more capsules of activated charcoal and add that to the ORT, shake it really well...and serve. In human and animal emergency departments worldwide activated charcoal is THE number one protocol given to 'soak up' and bind most poisons and it is non-toxic in any amount. Even if you are not sure—but you just suspect poisoning—go ahead and give the dog (or human) activated charcoal with the ORS.

Zinc, Iron, Vitamin A and essential fatty acid (EFAs) deficiencies are frequent in dogs in poor countries. Many skin conditions will NEVER improve unless you supplement with these.

The corn and rice diets of dogs in poor countries are deficient in zinc, iron, vitamin A and oil. Many dogs will need iron supplementation for weeks or months because diets (often only corn and rice) for

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dogs in poor countries are often iron deficient, and females who have had litters of puppies are at even greater risk of **iron deficiency**. See under ‘Dosages’ how to tell if a dog is anemic (look at their gums: pale gums are a sign of anemia). Their anemia can also be due to Anemia of Chronic Disease, and you do not want to give iron in this situation. I will always give him a vitamin/mineral supplement containing **Vitamin A and Zinc**, because some of these terrible skin conditions can be cured with Vitamin A and/or zinc. And I always supplement any food I give them with soybean oil (corn is ‘okay’, soy is better)—which I usually pour and mix into the sack of dry dog food. This soybean oil on the dry dog food does two things: it provides a fresh fat source of EFAs (very important) and it gives them much-needed calories. And this oil—like zinc and Vitamin A—can help cure their diseased skin. Plus they love it.

Give the dogs and cats soybean oil every day on their dry food, or just squirt some in a bowl or in their mouths.

“Dogs and cats have a dietary requirement for specific Essential Fatty Acids (EFAs), including linoleic acid (LA), an unsaturated EFA found in appreciable amounts in corn and soy oil. Cats also have a dietary requirement for another unsaturated EFA, arachidonic acid. Unlike dogs, cats cannot readily convert linoleic to arachidonic acid, which must be obtained from animal sources. Both linoleic acid and arachidonic acid are omega-6 fatty acids.

*Recent studies suggest that α -linolenic acid (ALA) (an omega-3 fatty acid found in soybean oil) is **also essential** in dogs and possibly in cats.” (see the section titled “Nutritional Requirements and Related Diseases of Small Animals” in the Merck Veterinary Manual)*

I recommend you put a spoon or two of Soybean oil on the dry dog food for each dog you are feeding dogs in poor (or even rich) countries. I do not trust the fat content in any dry dog food, no matter how expensive. The bags have been sitting around—often opened to the oxidizing air—for weeks or months and so the fat can be rancid. Dogs LOVE soybean oil—they intuitively know this is good for them. They would crowd around me at the Buddhist temples in Thailand begging me to squirt some extra in their mouths. I carried special squirt bottles for this that I got from a camping supply store. If I bought 8 sacks of dog food, I also bought 8 liters of soybean oil (corn is ‘ok’ but soybean has higher content of **LA** and **ALA**). I personally do not eat soybean oil, because butter, coconut and olive are ‘better’ for humans. But dogs and cats are different. **Soybean oil is ‘the’ oil to give them.** Of course, butter, coconut oil and olive oil are good for dogs, too, and if you feel like giving them some, that is okay but those oils do not have the mix of LA and ALA that most dogs in poor countries lack. So make your number one choice of oil Soybean if you are caring for dogs in poor countries, and number 2 is corn oil, if you can’t find soy.

You will not be able to fully heal many skin conditions—no matter how much medicine you give them-- if you do not make 100% sure the dogs and cats are getting LA and ALA---found in soybean oil and corn oil to a lesser extent--which are inexpensive oils to buy. Zinc & Vitamin A are also essential so supplement with those, too.

To each 20kg bag of dry dog food, add the entire quart/liter of soybean oil. A Quart or a liter has approximately 64 tablespoons of oil. A 20kg sack of dry dog food has 180 cups of food (9 cups per kg).

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So 64 tablespoons of oil on 180 cups of food is only one tablespoon for every 3 cups of food---not too much and maybe not enough. Which is why I would often squirt some extra oil in the mouths of the hungry, skinny dogs eagerly crowding around me at the temples, beseeching me for some more oil. The first time you give it they may turn their noses up at it. But after they get a taste of it, they are hooked! Sometimes the Monks would have numerous feeding plates and bowls scattered around so I would race around squirting some on each plate so that the crowd of dogs would get 'spread out' in such a way that the meeker animals could still get some without the dominant animals hogging it all.

Dogs in poor countries often eat mostly carbohydrates---rice, etc---and not nearly enough protein or fat. So the fat in the soybean oil will help them greatly by supplying them with LA and ALA, PLUS it will also give them much needed calories, since fat is the most concentrated form of calories. And **you will notice their skin and coats improve dramatically** over weeks and months of adding soybean oil to their diet. In fact, it is difficult if not impossible to heal a dog with a skin condition using only ivermectin and antibiotics, etc. This is because the skin---according the Merck Veterinary Manual---cannot function or heal without Essential Fatty Acids (EFAs), ESPECIALLY LA and ALA, which are found in the highest content in Soybean oil. Corn oil is 'okay' but soybean oil has a superior content of the Essential Fatty Acids (EFAs) known as LA and ALA.

*"Fatty acids are essential components of cell membranes and are an integral component of the intercellular barrier in the stratum corneum (skin layer). **Essential fatty acids cannot be synthesized and therefore must be supplied in the diet.** The essential fatty acids most important for homeostasis of the skin in **dogs** and **cats** are **linoleic acid (LA)** and **alpha linolenic acid (ALA)**. (HGG note: LA and ALA are found in high concentrations in inexpensive **SOYBEAN OIL**, and to a lesser extent in corn oil).*

*"Essential fatty acids are indicated for **pruritic (itching)** inflammatory diseases (eg, allergies, feline eosinophilic granuloma), **crusting** diseases (eg, discoid lupus erythematosus), and onychodystrophy (**malformation of a nail**). Many commercial products are available and may be used at the manufacturers' recommended dose. Lack of response to one product does not preclude response to another, and increasing the dose to several times the label recommendation can help in some cases. Approximately 20% of dogs and 50% of cats with allergic pruritus will show some improvement. There are few adverse effects."*

(From the section "Essential Fatty Acids for Integumentary Disease" in the Merck Veterinary Manual)

Plumb's Veterinary Drug Handbook

(for more discussion of this see the **Merck Veterinary Manual**, available for **free viewing online**, and which book **I recommend you purchase** because the 2,000 pages are an invaluable reference to have especially if you don't assume the internet will always be available to you. New copies are \$80 or so, but you can buy an older edition for much less. I also highly, highly recommend you buy a copy of **"Plumb's Veterinary Drug Handbook"**, which is not readily available on the internet for free viewing but email me if you cannot easily get a copy where you are and I can help get you a copy fast by email. If you are a vet or a non-vet, **you really must have a copy of "Plumb's Veterinary Drug Handbook"**. Giving drugs to an animal is something that you can screw up if you give the wrong doses, combinations, routes of delivery etc---which may result in your not being able to do the thing you want to do, which is heal the animal. Plumb's is easy to read, and is "THE" reference on drugs for animals,

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and is cited by everyone else when they themselves write medical articles on animal medicine. The section on using Amitraz dip for healing Demodex Mange is alone worth the price of the book, because Demodex can be difficult to heal, and giving Ivermectin daily or every other day for months is a real hassle, and doesn't always work anyway (which is one reason the only 'approved' treatment for Demodex is Amitraz dips). The discussion in Plumb's of Amitraz for Demodex is much more nuanced and practical than what is on the Amitraz bottle label.

If you can find a vet to help you **neuter the dogs** so they cannot make puppies, that would be great. Countries like Thailand don't have a program to neuter dogs, so you cannot expect the government to help you here. Their philosophy seems to be 'mai pen rai' which loosely translated means 'let it be', 'never mind' 'don't worry about it'. And when you first come to a country like Thailand and see all the suffering dogs roaming about you might tend to express, first, pity, and then, second, criticism, of a country that let's this happen. But consider that these same dogs would be quickly 'euthanized' (killed) in America. Here in Thailand, at least they have a chance at a life. In fact, you could argue that one of these rundown dogs that is freely roaming about with his friends has a better life than a pampered, well-fed dog left alone all day long either in a house or yard. At any rate, **neutering the dogs** is a great idea. You can pay a vet to do as many as your budget will allow. By donating to organizations like Spay First! which use the incredibly inexpensive, non-surgical calcium chloride injection method—only a few dollars for one cat or dog!--your money will prevent the births of dozens or hundreds of animals who would otherwise have a life of suffering. And if you can find a vet in your area to actually use the CaCl method, then that would be fantastic. Just contact Dr Denoij via his website and he will help your vet get the required chemicals delivered right to your door. When you help sterilize dogs and cats you will free up resources to better care for those who are born.

There is an injection, a hormone (progesterone), that is given to female dogs and cats to prevent pregnancy for 5 or 6 months, but this hormone can cause serious infections. So do not use this method to prevent pregnancy unless this is your only option. (see instructions elsewhere in the manual on how to dose, since you may very well need to use this medicine). You will see people using this method in Thailand and they use far, far too much, often 1cc or more per small or medium size animal, which is way too much. They are buying this med from the local pharmacy and the dosing instruction actually say to give that much—but the bottles and instructions are for humans weighing much more than a dog or a cat! Plus, the people are giving these injections every three months, when in fact every 5 or 6 months at a much lower dose is sufficient. So no wonder you will see many cases of severe, life-threatening infections of the uterus called pyometra in female dogs and cats. **If you have a female with vaginal discharge who is very ill**, then injecting Ceftriaxone is preferred, and take her to a vet if possible because she may have the very serious infection known as **pyometra**, which is common in countries where people frequently inject the females with too high a dose and frequency of a birth control hormone into female cats and dogs. **Signs of pyometra include abdominal distention, vaginal discharge, lethargy, depression, lack of appetite, vomiting, frequent urination.**

If you are caring for a female with vaginal discharge who is very ill, then **give her** a Subcutaneous injection of **Ceftriaxone** and take her to a vet especially if she has some of the other signs of pyometra. (Ceftriaxone label says give IM, but Plumb's says SC is fine. **IM is painful!**)

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Terminating pregnancy in dogs

Dexamethasone is readily available and inexpensive hormone used to treat shock, inflammation, anorexia in cancer patients, etc. It can also be used to cause resorption or abortion in the pregnant female dog. An oral dose of 0.2 mg/kg is given twice daily for ten days. *“Pregnancy Termination in the Bitch and Queen”* Bruce E. Eilts, DVM, MS, Diplomate ACT. But if she is too far along in her pregnancy, she can die with the fetuses when they are expelled. I have seen this happen: mother dead along with the expelled fetuses. So do not attempt to terminate a pregnancy unless under the direct supervision of a veterinarian. Vets have better drugs for this than dexamethasone. It is much better for you to spend your time and energy on spaying and neutering. See the section on using Calcium Chloride (CaCl) **Non-Surgical** method of **sterilization** in male dogs and cats, which **costs a couple of dollars per animal**, yes, one dollar per animal, no surgery!, takes only minutes.

Meds, Supplies, Techniques

The basics for every dog are:

Ivermectin, oral Give Ivermectin if there are signs of mange mites: red inflamed skin, extreme ‘constant’ itching and scratching, patchy hair loss or ‘total’ hair loss, or if dog is living near other dogs that have mange. Do not give Ivermectin to Collies, Sheepdogs or their crosses. “White feet, do not treat” see Discussion elsewhere on breeds not to give Ivermectin to.

And do not give Ivermectin to any animal who has a fever, because fevers can compromise the Blood Brain Barrier (BBB) and when the BBB is compromised the Ivermectin can cross the BBB, causing serious problems including death. So when you have a dog with a fever, then treat him with the Oral Rehydration Solution (ORS) made-with-chicken soup instead of plain water. And give the dog a trial course of antibiotics: cephalexin (or amoxicillin) if a skin infection and doxycycline if dog has had a heavy tick burden.

Worm pills eaten in cheese, sausages or given by hand in back of mouth (see directions). You can put amoxicillin and ivermectin in a little milk and dogs will drink it. But the worm pills need to be put in cheese, butter or sausage---or just pushed into the back of the throat (see directions for ‘pilling’ a dog elsewhere). ***“All dogs have worms until proven otherwise”***, my Thai vet said to me. Translation: Deworm all dogs at least yearly without expensive and fallible testing. For first deworming, given an additional dose two weeks after initial dose.

Flea/tick liquid such as Frontline or Advantage or a generic local version of same—if long hair, cut the hair in a one inch circle behind the neck to expose the skin then pour the medicine on one spot on the neck. Cutting a one inch spot will allow the med to go on the skin rather than the hair just wicking the medicine away from the skin. If you have bathed the dog, then wait three days to put the flea/tick medicine on. And don’t bathe again with soap for 3-4 weeks because that will wash the medicine off. But if the dog has a serious skin condition, you may need to bathe weekly, in which case you can use a little flea/tick powder on hair, (but not directly on inflamed bare skin with sores, etc).

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Doxycycline. Because doxycycline is cheap (a few cents per tablet) I recommend that if the dogs you are caring for have or had large numbers of ticks then you should consider giving most dogs doxycycline daily for one month to kill the inevitable tick-borne pathogens they are carrying in a country like Thailand, where EVERY dog has ticks, often many, many ticks. Especially when you see dogs who are listless, have difficulty walking, or seem stiff, or walk stiffly or with effort---you are probably seeing the result of tick-borne infections which target many organs in the body including the joints, and I would definitely give these dogs a one month course of daily doxycycline. When giving any creature doxycycline you must follow the capsule or table with water, milk or food to make absolutely sure it does not stay in the esophagous, because it cause burns if the pill dissolves there or the capsule breaks open there. Doxycycline is one of the first-line drugs for Lyme Disease in humans who get bitten by a tick carrying this spirochete bacteria in the shape of a cork-screw which can power itself to spin around, digging deep into your tissues. Syphilis is a spirochete. In the USA I found the cardinal sign of Lyme Disease tick bite on myself---a red bulls eye. I was one of the lucky ones, because the red bulls eye means the tick had just been there and the bacteria hadn't had time to burrow deep into my body. So they were easy to kill with a month of daily oral doxycycline, plus I sprinkled doxycycline over the red bulls eye and then rubbed DMSO on top of the doxycycline thereby insuring it would be carried under the skin and right on top of the little terrorist Lyme spirochetes that were massing for an attack on my body. Ticks carry other dangerous pathogens besides Lyme, so your dog friends may be carrying 1 or 2 or more kinds of pathogens that are harming the animal. Doxycycline will kill many of these.

Additional meds:

For those dogs with really bad skin then they need a bath preferably with **special dog shampoo** containing some or all of the following: **coal tar, sulphur, salicylic acid, benzoyl peroxide**. Shampoos like this are available in Thailand. However, if you don't have access to this type shampoo then any soap will do. You can buy tubes of benzoyl peroxide and find dog shampoos with the other ingredients mentioned above. When bathing a dog I will mix a couple kinds of shampoos with a 'squirt' of benzoyl peroxide. It is important to let the shampoo stay on the dog for 10 minutes. Be sure and rub the shampoo mixture into the coat and skin while you are waiting the 10 minutes. Before you start the bath put a collar and leash on the dog and put your arm through the loop on the other end of the leash—to prevent an escape while covered in suds.

Oral antibiotics for wounds, sores and skin or other infections, or if a dog seems really run down from mange, etc. Amoxicillin, Cephalixin, clindamycin.

Injectible antibiotic for extra-serious infections. Ceftriaxone is a good choice because it is broad spectrum an inexpensive in places like Thailand (one dollar for a box that contains the medicine in powder form in one sterile bottle and the box contains a second bottle of sterile water. This one gram is good for up to 2 or even 3 injections depending on dog size. Immediately before injecting, use a sterile needle and syringe to withdraw the sterile water and then insert the needle through the rubber stopper of the bottle with the powdered Ceftriaxone. Shake well. Instructions that come with it explain that it will retain most of its potency for several days after reconstituted if you refrigerate it. You will use it the next day for a second injection anyway because the animal is very sick, which is why

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you are using the ‘big gun’ Ceftriaxone. The remainder that I refrigerate I will take out the next day to carry in my pack but I place it next to a cold pack or some ice to keep it cold until I can see the animal. This is especially important in hot climates like Thailand.

Antibiotic ointment applied directly to wound (topical antibiotics)

Iodine liquid (Betadine) for putting on wounds.

antihistamine Chlorpheniramine tablets or **diphenhydramine (‘Benadryl’)** for dogs itching terribly.

prednisolone tablets for dogs itching terribly and for dogs who’ve been in accident or are very, very run down.

Print out the “Dosages Chart” and carry it with you so you get the amounts right.

A word on the 1cc syringes that you need to carry. A **1cc syringe** is just that, a syringe with a MAXIMUM of 1cc. It is very skinny, not much more in width than a thick pencil lead. Using a 1cc syringe to administer Ivermectin is helpful so you don’t make mistakes and give too much Ivermectin as you might if you were using a 3cc syringe. You can use your 3cc syringes for squirting milk or water in mouths to help them swallow whatever pill you’ve shoved in the back of their tongue—see below for ‘pilling’ instructions.

I carry a backpack of items to treat dogs in the field—at the Buddhist temples (Wats) or at the homes of dog owners.

Here is what is in my backpack.

A couple of **bottles of water** for human drinking. Don’t forget to stay hydrated yourself especially in hot, humid climates. Don’t wait till you feel thirsty, but take frequent sips instead. Eat plenty of salt, preferably sea salt. Drinking a lot of water without salt is dangerous especially if you are sweating (losing salt!). Learn to make a liter of homemade Gatorade—Oral Rehydration Solution (ORS)—that I teach you how to do in this manual. Drink that between meals. Or, you can drink plain water and eat salty chips/crackers if you don’t have the homemade Gatorade with you, but the homemade Gatorade works really fast at replenishing fluids and electrolytes.

Small notebook for writing dog’s description (*“brown & white dog lives near noodle shop, weighs x kilograms, appears to have sarcoptes mites”*), and then write which meds given on which date, progress of treatment, etc. Because you’re treating many dogs you need to keep a record so you can give meds for proper time, dosage, etc

Plastic syringes, several of **1 cc—without needles**. And several of **3 cc** size for squirting water & milk in mouth after giving meds to help them swallow.

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Ivermectin for mites/mange & worms a 50 ml bottle or a 100 ml bottle. Stick a #18 needle in the rubber stopper and use duct tape to **TAPE the NEEDLE to the Bottle** so the needle won't come out. (lower number needles are bigger diameter, which you need for thick Ivermectin). Carry this in a clean plastic bottle for example a clean peanut butter bottle, with top, so the needle won't get banged around in your backpack. I leave needle stuck there, never taking it out—you've taped it there, remember. But only use this bottle for oral administration...because you will often be inserting and reinserting the same one cc syringe in it while you are in the field and that syringe will no longer be sterile, especially if you do as I do which is put this little one cc syringe over and over into the mouths of many dogs throughout the day. (Besides, I never give Ivermectin via injection anyway. It is unnecessary to inject. See elsewhere here in the manual. But if for some reason that you think you have to absolutely have to inject Ivermectin (you don't!) then make sure you use a separate bottle. I then just take my 1 cc syringe and withdraw the correct dosage always leaving the needle in the bottle. Using the plastic 1cc syringe without a needle, I then squirt the Ivermectin into the back of the mouth of the dog, or I squirt it into milk and let the dog drink it. Ivermectin has an unpleasant taste but when squirted into milk or chicken soup, dog will eat it. I've eaten it myself in juice as a human de-worming protocol—it was easy to swallow this way. I usually just squirt it in their mouths—they never run away because they know some food or soybean oil is coming.

Sausages for 'pilling' those dogs I know won't approach me—you can buy as you're out and about but bring them with you if you know you'll need them. Put the meds in the sausage, toss the sausage to the fearful dog.

Spare #18 needles in case I lose or dirty the one that is taped to the ivermectin bottle.

amoxicillin (antibiotic) capsules because it is a really cheap antibiotic that works in most situations.

cephalexin (antibiotic) bottle of 500 mg capsules. The one I use the most, since it is so good for the skin infections you are usually dealing with. Often I only carry cephalexin and doxycycline.

clindamycin (antibiotic)

ceftriaxone (antibiotic)

Doxycycline tablets (capsules are available but try and only use tablets if you have a choice because if doxycycline gets stuck in the esophagus it is much easier for the capsules to open there causing esophageal burning. Which is why it is always a good idea to follow caps or tablets with some milk or water to help animal get it into the stomach.

Griseofulvin antifungal for the skin fungal infection known as 'ringworm' (dermatophytosis).

itraconazole for deep, systemic fungal infections.

Ketoconazole is much cheaper than itraconazole but it can stress the adrenal glands by lowering cortisol. But it nevertheless is widely used when budget is a concern. (See 'Plumb's Veterinary Drug Handbook' and if you cannot easily get a hard copy email me and I can get an electronic version emailed to you). When giving ketoconazole, consider also giving a small dose of prednisolone to replace the cortisol that ketoconazole interferes with---but do not give prednisolone long-term to a dog with Demodex mange.

prednisolone, (steroid hormone) 5mg tablets. for inflammation, severe itching and scratching especially with bloody sores; for shock or injuries from car accident, but dexamethasone preferable for shock or car accident. (but don't give long term to dogs with Demodex mange).

antihistamine tablets for itching (for ex; **Chlorpheniramine** or **diphenhydramine ('Benadryl')**). Important to give to severely itching and scratching dog, especially if there are bloody sores that need to heal. Also used for allergic reactions, bee stings, etc.

Antibiotic cream for putting on wounds/scabs on dogs.

Iodine (liquid) for pouring on human wounds after washing them but also certainly for dog wounds since iodine will kill bacteria, fungus and viruses. Pour it on wound with 3% hydrogen peroxide: "brown and bubbly" per Dr Russell Blaylock, MD

flea/tick medicine many little pre-measured bottles of liquid—if you can find them that aren't expensive like Frontline--that you pour on one spot behind shoulders. Also recommended are the flea and tick powders—only a couple of dollars per large bottle of powder which will be good for many, many applications. Look especially for those powders with pyrethrin as the main ingredient. Pyrethrins are derived from the chrysanthemum and are among the safest and least toxic insecticides. They kill but they also repel, something the powders with carbamates or organophosphates don't do. Any of these powders are very good for quick 'knock down' of infestations among a group of dogs or in an area where they live.

acepromazine, ('Ace') tablets can help immobilize a dog that is seriously ill and won't let you approach it. Or for a dog with maggots in an open wound that you need to pick those maggots out for an hour or more and you need to have the dog hold still—unless it's a golden retriever or another 'calm' dog--then he may hold still without meds. Put the 'Ace' in sausage and toss it to dog—he will become uncoordinated and 'paralyzed' pretty quickly. For a big dog you may have to use a higher dose. When immobilized put the leash on him and your arm (your leg is even better). But remember the dog is conscious—he just cannot move. Acepromazine will not dull pain perception. Excited animals may need more Ace than less excited animals. Dr Katz, who is an expert in immobilizing large, wild animals states you should never use a muzzle on one of these animals because it means 1) you haven't immobilized him correctly and 2) what happens if he wakes up and runs off with the muzzle on. But, for me, when immobilizing a dog I will put a muzzle on them because I don't have access to the strong 'knock-out' drugs Dr Katz is using—Dr Katz certainly would never use Acepromazine by itself on any bear, etc--and the likelihood of the dog running off with the muzzle on is very low because I've

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got him leashed to me. (One end of the leash is around dog's neck, of course; and the other 'looped' end is around my upper arm, tight). You have to understand that Acepromazine, by itself, will not guarantee the dog cannot 'wake up' and bite you when you are cutting tangled knotted hair (which cutting could hurt him) or jabbing him with a needle.

Iodine, for pouring on wounds including your own wounds or scratches especially after dog saliva has gotten on an open wound which you must wash with soap and water.

activated charcoal capsules or tablets. For giving to animal if it has eaten poison **or even if you suspect he has eaten poison**. Great for humans, too: either for accidental poisoning or for when you eat contaminated food. Should be in every emergency kit for dogs or humans. **The first sign of some poisonings is lethargy, depression and dog doesn't want to eat.** Main sign in humans is NOT vomiting and diarrhea, but rather malaise and headache. And note for many mild cases of food poisoning a person does not have to eat 1g/kg charcoal but rather only a handful of capsules. If you have a dog that doesn't want to eat or looks depressed and you suspect poisoning, then give them activated charcoal. But the animal could be depressed from pain he is experiencing from other causes such as being hit by a car or motorcycle, in which case he needs prednisolone (or dexamethasone) along with a pain med such as lidocaine. See discussion elsewhere on how to administer.

scissors. For cutting hair, dead skin etc. Good idea to have several kinds. Best to buy from a doctor who can order you foreign made high-quality, as good local steel and construction is rare. But whatever you can get is better than nothing.

tweezers for removing ticks. Very important to not remove ticks with your fingers because this can squeeze tick stomach contents into animal! People can get diseases from ticks, too, so that is another reason NEVER to squeeze ticks with fingers, or break ticks with fingers, or smash them on the ground, etc. Use tweezers and grab tick at head area—do not grab body of tick with tweezers—only grab the head area, and then pull. (place each tick in a bowl of water with a little bleach in it).

surgical gloves. Best to wear gloves at all times and keep your fingernails cut very short. Take your clothes off when you come home from your 'rounds' and throw them in wash, and take a shower.

Flashlight. A headlamp is even better.

liquid milk that needs no refrigeration before opening. This UHT (Ultra High Temperature pasteurization) milk is available in little boxes and is so extremely useful when giving medicines to shy dogs who won't let you put meds directly in their mouths. Just pour the meds in a little bit of milk, set the bowl down, step back, and the dog will approach the bowl and drink. I carry at least 6 boxes with me on my outings, sometimes more. One box can be used for 3 or 4 dogs. You only need a little to mix with the meds. But you can always buy it at every little corner shop in Thailand. Do not use soymilk. Soymilk is a low-quality food, and dogs don't like it anyway. Carry screw top bottle to place milk in after opening.

Dry dog food that I've poured some vegetable oil on before leaving home. If I'm driving our little truck I carry 20 kg.

Plastic or metal bowl. Essential for administering Ivermectin, antibiotics and other meds for dogs that won't let you put the meds in their mouths. Add a little UHT Milk (no refrigeration necessary until opened) from among the boxes of this milk that you should carry. Carry a clean empty bottle with tight top so you can pour remaining milk in it, once you've opened one of the milk boxes.

Leash with choke collar. Make a loop at both ends so you can insert your arm through one end so that you have both hands free while bathing dog, etc. You don't want the soapy dog running off.

Empty plastic bottle

with screw top lids, such as 1 lb peanut butter plastic bottles. You can use these to pour excess milk into after you've opened and partially used box of milk. So you can save some of the box of milk for the next dog. You can also use one to keep your bottle of Ivermectin in that has the needle taped securely in the stopper of the Ivermectin bottle. Carrying your Ivermectin bottle inside a plastic bottle with lid will ensure the taped-needle doesn't get dislodged.

Hydrogen peroxide for making the patient vomit. Only rarely should you try and induce vomiting, however. Making the animal vomit if you know the dog has swallowed poison within an hour or two—that may be a good idea. But in most poisoning cases it is now standard procedure to NOT induce vomiting for fear of patient aspirating vomit, drugs or peroxide into lungs. Instead of making vomit, give activated charcoal as soon as possible. But if a grave emergency, for example dog has just swallowed some poison, then—if you don't have a syringe (no needle! Syringe only!)—you can stick a straw toward the back of his throat and use your mouth filled with hydrogen peroxide to squirt 5-20ml of hydrogen peroxide down the straw into the back of his throat—he will vomit almost instantly. (The actual dosage recommendations are 2ml/kg: 1 **tea**spoon per 5 lbs., not to exceed 3 **table**spoons, tbs). Repeat if necessary but give no more than 45 ml (3 tbs) total hydrogen peroxide. *“It should be administered cautiously, especially in cats, because aspiration of hydrogen peroxide foam causes severe aspiration pneumonia”.* (Merck Vet Manual)

Using hydrogen peroxide for wounds

Note that some medical professionals will react with horror at the mention of **putting drops of hydrogen peroxide on a wound.** Somewhere, somehow, they got the idea that this is harmful, but their fear is misplaced as long as we are talking about 'regular' hydrogen peroxide, 3% (three percent) solution on 'regular' wounds (i.e., not burn wounds, for example). There are stronger formulations of hydrogen peroxide so do not use those. Use only 3%. If the health care professional still insists this is 'bad' then ask them where is hydrogen peroxide found. When they answer “the pharmacy” you respond by telling them that **nearly all living things make hydrogen peroxide** at the cellular level in order to kill pathogens.

Use of Honey for Wound Healing

And, according to the science literature, one of the mechanisms of how applying honey to wounds is so helpful is because honey produces low levels of hydrogen peroxide and this is helpful, even on burn

wounds. So if you run out of ‘regular’ medicines, or in addition to regular topical medicine, you can apply honey, even to burn wounds (dogs occasionally have boiling water thrown or spilled on them, so you very well may have to treat burn wounds).

*“Honey has anti-oxidant, anti-bacterial, anti-viral and anti-inflammatory properties. It can be used as a **wound dressing to promote rapid and improved healing**. These effects are due to honey's anti-bacterial action, secondary to its high acidity, osmotic effect, anti-oxidant content and hydrogen peroxide content. The use of honey leads to improved wound healing in acute cases, **pain relief in burn patients** and decreased inflammatory response in such patients. However, it has proven to be ineffective in chronic leg ulcers. Overall, studies have been done in favor of the use of honey in medicine. CONCLUSIONS: Honey has almost equal or slightly superior effects when compared with conventional treatments for acute wounds and superficial partial thickness burns.”*

From the medical paper, “Evidence for Clinical Use of Honey in Wound Healing as an Anti-bacterial, Anti-inflammatory Anti-oxidant and Anti-viral Agent: A Review”. (find it and dozens more articles on honey and wounds at pubmed.gov)

So let’s put to rest forever the idea that 3% hydrogen peroxide is ‘bad’ to put on wounds. The following quotes are from Dr Russell Blaylock, MD (neurosurgeon, retired).

“The tetanus vaccine is the most absurd vaccine of all. First, I cannot imagine how it was added to the required vaccines, since tetanus is not a communicable disease. You can only get tetanus from individual exposures; it is not spread from person to person. It is also extremely rare. In all of my years of practice, I have never seen a case of tetanus, and most physicians have a similar experience. It is as rare as hen’s teeth.

***“If you clean your child’s wound with soapy water followed by hydrogen peroxide, they will never get tetanus.** The organism is an anaerobic germ, which means it cannot live in the presence of oxygen, and hydrogen peroxide fills the wound with oxygen. I once treated an Amish child who had his head run over with a manure spreader. Manure is the source of most tetanus spores, and this child had a number of deep gashes over his scalp, all filled with manure.*

*“I carefully cleaned his wounds with **hydrogen peroxide mixed with betadine/iodine** (a 50/50 mixture doctors have termed “brown and bubbly”). Since his parents were Amish, they refused to let me give him a tetanus shot.*

“The boy made an uneventful recovery and never developed tetanus or any other infection. That was the most intense test of tetanus prevention by hydrogen peroxide I have ever seen. To give a tetanus shot for a clean wound is absurd, yet doctors and mothers never think twice about giving the shot or having their child vaccinated. What we do know, is that this is one of the vaccines frequently associated with severe reactions, many of which are neurological.

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*“Warm, soapy water kills most germs and many viruses. **Never use antibacterial soaps on a wound**—they can lead to allergic reactions. Certain nutrients, such as zinc and vitamin C orally, speed wound healing. They not only speed healing but also strengthen the wound. Curcumin, extracted from the spice turmeric, has been shown to significantly speed the healing of wounds when taken orally.*

*“Methicillin-resistant Staphylococcus aureus (**MRSA**) infections made all the headlines a few years back. So, what’s become of the so-called “flesh-eating bacteria”? There is no doubt that it is a scary infection and may be linked to the use of antibiotics in foods (especially chicken and beef) and the abuse of antibiotics in hospitals and clinics. It turns out early treatment with **“brown and bubbly” kills MRSA, as it will most organisms.** I have used it for every kind of serious infection known. **Nothing works better”**.
Dr Russell Blaylock, MD (neurosurgeon, retired)*

Note: **In any bite or puncture wound**, besides putting ‘brown and bubbly’ on it after thoroughly washing with soap and water, **you need to keep the wound open until healing starts**, because the bacterium is anaerobic and the open wound will allow oxygen to reach the bacteria.

I always carry 4 or 5 kg of **dry dog food** in my back pack if I am walking or on my motorbike, or 20 kg if in my truck. I place small piles on the ground or cement, or a clean area—so dog food doesn’t get covered in dirt—a meter or more apart so they don’t fight over one pile. This way I make friends with the dogs, they come near me so I can treat them, etc. The dog food is also a source of protein which they don’t get much of, being fed the same high-white rice, low protein diet that most of the people get here. I want the dogs I treat to get better and, for me, spending the extra money to feed them once or twice a week or more is worth it. Note on administering dog food to several or more dogs: Put the small piles of dog food several or more meters apart so as to discourage fighting over one pile of dog food.

With really **run-down dogs**—dogs with open scabs, no or little hair, emaciated—that “full care” is called for, that is, treating for 1) mites, 2) fleas/ticks, 3) worms 4) bacterial infections and feeding them until they get better. You may have to treat for fungal infections, too, such as ‘ringworm’ if you see the tell-tale ‘rings’ of hair loss, and/or unthrifty coat with dry, brittle hairs that break easily. And if a dog has ringworm you may need to treat other dogs it is close to, because ringworm fungus is contagious. Perhaps the main reason they got ‘rundown’ (sick) in the first place is because of inadequate nutrition.

Giving a dog like this several **baths with special shampoos** (see elsewhere) over a period of several weeks will really help his progress. Feeding him is really important. If he will eat the dry food that has vegetable oil poured on it, fine. But supplementing the dry food with meats and chicken soup with a little salt & rice (or sugar if you have no rice) will heal him faster. Giving vitamins with iron, zinc, vitamin A is important because he is probably deficient in those things, which are essential for wounds to heal and for skin health.

If you don't add rice then add some sugar because the water plus salt plus sugar combination is necessary to quickly rehydrate (see my discussion elsewhere under Oral Rehydration Solution). Make it no more salty than tears.

Dogs are happy when they are eating—especially if they are run-down, sick dogs—and I like being around happy dogs. Happy dogs make me happy. So I feed many of the dogs I care for—not just the really rundown ones-- a couple times a week, often with a lot more than just 3 or 4 kg (that is not enough for 20 dogs at one temple). Feeding them this way helps them to improve much more rapidly than they otherwise would with medicine alone. And pouring soybean oil on the dry dog food gives them get essential fatty acids (EFAs) that may be lacking in the dry dog food, plus it gives them much needed calories.

Ivermectin: How to Administer

Do not give Ivermectin to Collies, Sheepdogs, Australian Shepherds or their crosses. “White feet, do not treat”. See the Ivermectin discussion elsewhere in the Manual.

The breeds more affected by this mutation are (% frequency): Collie (70%), Long-haired Whippet (65%), Australian Shepherd (50%, also mini), McNab (30%), Silken Windhound (30%), English Shepherd (15%), Shetland Sheepdog (15%), English Shepherd (15%), German Shepherd (10%), Herding Breed Cross (10%). Other less affected breeds are: Old English Sheepdog, Border Collie, Berger Blanc Suisse, Bobtail, Wäller. The only way to be sure that a dog is affected or not is to test for it. As more dogs are tested it is likely that the mutation is discovered in other breeds, or that the frequencies change.

Note that the toxicity these breeds have to Ivermectin is a reaction to more than a drop or two. Note that it is less than one drop of Ivermectin that is the dose to give all dogs every month for heartworm prevention (I give a drop or two). Ivermectin is the active ingredient in Heartgard. So most vets consider a drop or so per month to the sensitive breeds listed above to be safe to give them to prevent heartworm (from mosquitos). What is not safe is to treat those breeds with Ivermectin if they have mange, because doses for mange treatment are much larger than the one drop needed per month for heartworm prevention. Those doses for mange (mites) are often 10-20 drops or more, depending on weight. In Thailand, most dogs are mutts and are not one of the sensitive breeds. Still, you have to be on guard.

But there is still a reaction that can happen in ANY breed from the one drop per month for heartworm treatment. This reaction isn't to the medicine but instead is to the dying of millions of microfilaria (baby heartworms) that the one drop causes to die. This could happen in a dog that had a high microfilaria count who was given Ivermectin for the first time. I have treated hundreds and hundreds of dogs in mosquito infested Thailand and I have only had good responses. Still, it is good to know that this reaction could happen so you know how to deal with it. If you don't have an IV to give IV saline then give Oral Rehydration Solution made with chicken soup orally, or if dog is unconscious or in shock then make the ORS by itself and give rectally. The dog will need prednisolone or dexamethasone orally,

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injected or rectally. See discussion elsewhere on ORS (homemade Gatorade) as essential life-saving measure.

“The sudden death of microfilariae releases enormous amounts of allergens that can cause an allergic shock. The following symptoms may develop about 5 hours after treatment: pale mucosae, tachypnea (rapid breathing), dispnea (difficult breathing), vomit, weak and accelerated pulse, weakness, fever and ataxia (uncoordinated movements). Therapy requires shock treatment, including administration of corticosteroids (prednisolone, dexamethasone) and fluid supply”. (Note: It is optional, but you can also give an antihistamine on top of the prednisolone or dexamethasone. And if you don’t have any of these meds in injectable form, then crush and administer rectally using the ORS as fluid. See instructions elsewhere for ORS.)

If you suspect the dog has a high microfilaria count then you could administer the corticosteroid and Benadryl (or chlorpheniramine or other antihistamine) before you gave the one drop of Ivermectin. But I have never done this and the medical literature states that shock reactions to microfilaria dying are extremely rare. Ivermectin is a very safe medicine used appropriately and I have only seen truly wonderful things happen with it, usually almost ‘immediately’ (within a day or three): itching and suffering and sleeplessness is gone; health and vitality return after the Ivermectin eliminates the 8 legged mites who are living, defecating, eating, procreating and dying under the skin in a constant cycle that is basically torture for the dog.

Your bottle of **Ivermectin: Use a #18 needle** because this is wide enough to let the thick Ivermectin flow. You can experiment with different needle sizes but if you’re having a hard time ‘pulling’ the Ivermectin from the bottle then the needle size is too small (larger numbers mean smaller needles; I find a 23 will not work with the Ivermectin but an 18 is great).

Stick the needle in the rubber stopper of Ivermectin bottle. Use duct tape to **tape the needle to the bottle** so that it cannot be pulled out. Put your bottle with *taped* needle into an empty, clean bottle with lid (a peanut butter bottle that you’ve cleaned well works). Keep your 1cc syringe in the bottle. When you need to administer Ivermectin orally to a dog then stick your 1cc (almost pencil-lead thin) syringe in the plastic end of the taped needle, invert the Ivermectin bottle, withdraw the appropriate amount into your syringe. Then squirt it in bowl of milk, or directly into dogs mouth (without using needle) and then use a 3cc syringe (without using needle) to follow the ivermectin squirt with milk squirt—this helps the dog ‘enjoy’ the yucky taste of Ivermectin. Rinse the syringe off with water if it’s been in dog’s mouth.

If there are 20 dogs at a temple but only 3 of them need medicine (usually just ivermectin and antibiotics) what do you do if those 3 dogs won’t let you get close to them to squirt Ivermectin in their mouths, or push the antibiotic pills down their mouths? If you put the medicine in a bowl of milk all 20 dogs will try and drink that milk, and 3 dogs that need the medicine will never get it.

Here’s what you do: Get your ivermectin syringe (without needle!) and your antibiotic capsules ready. Let’s say the 3 dogs weight 10 kg each so you need to give for each $10 \text{ kg} \times .5\text{mg/kg} = 5\text{mg}$ of

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Ivermectin or 5/10ths of 1 cc syringe for each. Squirt the Ivermectin and open the antibiotic capsule into the bowl which has a little milk in it. Set it down near one of the shy dogs not making eye contact with him while at the same time you hold your hand out in 'Stop' language to other dogs and you can scatter some nuggets of dog food toward the other dogs to distract them. Make sure you pour some milk on the nuggets of food you scatter because then you will not have all the dogs trying to get the milk from your Ivermectin milkbowl Repeat procedure for the other shy dogs.

Fortunately, most dogs—after they get to know you and like you (because you bring them vegetable-oil coated dry dog food) will let you squirt the Ivermectin in the back of their mouths before you feed them. Their 'reward' for letting you squirt ivermectin and 'pill' them with antibiotics is to get to eat dry dog food or drink a little milk from your bowl.

Another trick is to withdraw correct amount of Ivermectin for the weight of the dog and then use a second larger syringe with milk to squirt in their mouth immediately after you've squirted Ivermectin in. They love this and will come back for more the next time you visit them. "Chasing" the bitter taste of Ivermectin with milk always works, so much so that when they see the milk come out, they 'line up' to get some.

It is a good idea to learn to ['pill' a dog](#). By 'pill a dog' I mean putting a tablet or capsule of medicine far enough in the back of the dogs mouth so he has no choice but to swallow it.

There is a right way and a wrong way to do this. The wrong way can get you a very deep bite on your thumb, all done accidentally by the dog. The correct way is safe and easy, once you learn how to do it.

Before you try pilling a dog it is a good idea for the dog to like you which he will after you've fed him some dry dog food. You want the dog to feel comfortable with your touching him before you try and shove a pill down his throat. So, I always pet them and scratch gently the inside of their ears, etc. Then I pill them. But if the dog growls, or aggressively resists the pilling then I will not attempt it. I will put the medicine in a little milk in a bowl and let them drink it.

Before you pill the dog get your 3cc or larger syringe full of water or milk. Because after you've put the pill in the dogs mouth you can squirt some milk or water into his mouth to make sure he swallows the pill. (If you use milk you will be giving the dog more reason to 'like' you and let you pill him on subsequent days—positive reinforcement.)

Squirting milk or water in his mouth after you've shoved the pill far back in almost guarantees he will swallow it as long as you've shoved the pill far back along his tongue toward the back of his throat.

To pill a dog: If you're right handed then do the following. Hold the pill between your right thumb and forefinger. Take your left hand and pet the top of the dogs head. Still using your left hand use your fingers to gently hold the top of the dogs mouth (snout) while at the same time you insert the pill in the dogs mouth with your two fingers of your right hand but as soon as you enter his mouth you then use only your thumb to push the pill far back along his tongue to far back in his throat while using your

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left hand to hold the top of his mouth open. You do not need to ‘force’ the dog to do this. Using gentle pressure with your left hand on top of his mouth (snout) is all that is needed, while you softly talk to him. Do not squeeze the dog’s snout hard, it will just irritate him. After you pill him, rub under his throat and neck back and forth; this will help him swallow the pill. You can also squirt a little water or milk in his mouth with your 3ml/cc syringe.

To do this without getting bitten accidentally by the dog you must, I repeat must, push the pill along the Length of his tongue, keeping your thumb parallel to his tongue and your thumb with pill is **pushing Straight Back along his tongue**, keeping your thumb straight as well so that it never comes between his **rear** teeth. His rear teeth have the incredible power that you don’t want to feel on your thumb! This way if he closes his mouth the only teeth that will touch your thumb will be his front teeth, and the front teeth will have little force or power behind them. If, however, you make the mistake of sticking your thumb in his mouth at right angles to his teeth then your thumb may very well end up between his back teeth—and if (when!) those teeth close down on your thumb you will be accidentally but very painfully bitten because the force exerted between the rear teeth of a dog is awesome. After you’ve made the mistake only one time of sticking your thumb at right angles underneath his rear teeth, you will probably never make that mistake again. I’ve never been bitten since that time years and years ago.

Look on youtube for short videos on ‘how to pill a dog’.

Once you’ve pillled dogs a dozen or so times the motions will become second nature and you can pill dogs one after another easily and without ever being accidentally bitten. Especially since you’re rewarding them with a squirt of milk from your 3 cc syringe (without needle of course). For those dogs you don’t want to bother ‘pilling’ by hand—or for those dogs who absolutely won’t let you near them-- , there is always the medicine-in-the-milk routine.

Another trick for giving medicine

And there is yet another way if the dog you are treating won’t even get close enough to drink your milk. You buy some sausages/hot dogs and tear off a piece of it and shove the pill in it and throw the whole thing out to the dog. Works pretty well, though pills can often come out of the meat or sausage—in which case, switch to using cheese slices and wrapping the pills in a small piece of one slice. (But doesn’t really work well for Ivermectin, a liquid). I carry my sausages and other perishables in a small **insulated collapsible lunch box** with a **blue ice pack** I’ve frozen overnight.

Two kinds of Mites (mange)

There are two kinds of mange/mites. Sarcoptes and Demodex. Sarcoptes is the kind you will see most and the easiest to treat. It is contagious from dog to dog so that dogs that live together may have given Sarcoptes to each other. It produces the **itching** and red skin and patches of hair falling out. Demodex produces red, inflamed skin with patchy hair loss, too, but **without** the severe itching. You only need to give two oral doses of Ivermectin spaced two weeks apart to fix Sarcoptes Mange/Mites. Sometimes just one dose will work for Sarcoptes mange which is why I will give it to a dog I see that I know I may

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never see again. Demodex is passed only from every mother to every pup but most will never become sick or hairless from the mites, as long as they are well-nourished. Well-fed puppies and adult dogs will usually have an immune system which keeps the few Demodex they have stay 'in check'. Some dogs have a genetic defect that can cause some dogs to become 'overrun' with Demodex. But we know now that genes can be turned on or off by nutrition. Demodectic Mange is generally a disease of young dogs that have inadequate or poorly developed immune systems or older dogs that are suffering from a suppressed immune system. Note that the number one cause of immune systems becoming suppressed is inadequate nutrition. This applies to people as well as animals. Many dogs in Thailand get only rice and corn to eat, which is lacking in protein and other important things including iron, iodine, zinc & Vitamin A.

So a dog that has inadequate protein plus perhaps other infections that 'drag' the immune system 'down'—that can influence the immune system of the dog so that it can no longer control the naturally occurring Demodex mites and the dog loses its hair in patches (that don't itch like the other kind of mange, Sarcoptes), then maybe loses all its hair, and its skin may become, at first, red and inflamed (without itching) then become black and thickened, so black and thickened that you may think you are looking at a creature other than a dog. A similar situation exists in humans **with tuberculosis (TB)**. We know that people who smoke, drink alcohol, are protein-deficient, live in a lot of air pollution or who are deficient in Vitamin D—these people have a much higher chance of getting sick from TB. *"One-third of the world's population is thought to have been infected with M. tuberculosis, with new infections occurring in about 1% of the population each year. In 2007, an estimated 13.7 million chronic cases were active globally, while in 2013, an estimated 9 million new cases and 1.5 million associated deaths occurred, mostly in developing countries"*. (Wikipedia) So, you see, many of us are carrying TB but we will not get sick with it unless our immune systems get rundown for the reasons mentioned.

The dog with Demodex may not be itching but it can have red inflamed skin which indicates a bacterial infection. Giving a 2-3 week course of antibiotics is a good idea, too, to help clear bacterial infections that often come with Demodex, whether with red, inflamed skin or the black, thickened skin. The hair loss of Demodex usually begins on the face and around the eyes. When there are only a few patches this is called localized Demodectic mange. If it spreads to many patches then it is called generalized demodectic mange. Look on the internet for pics of dogs with Demodex. Dogs with a few spots of localized demodex mange do not need 'all-out' medical care, because the localized Demodex can often clear up if you feed and bathe him. So if you are helping a dog with generalized Demodex remember that just giving them some Ivermectin or the dips mentioned below may not be enough. You may have to feed the dog really well and even give supplemental vitamins and minerals including iron, zinc, iodine and Vitamin A. Deworm the dog, too, because worms 'steal' nutrients. Reading the Merck Vet Manual teaches that dogs with poor diets are deficient in Vitamin A, zinc--and EFAs found in soybean oil--all of which are essential for healthy skin and wound healing. Many dogs in poor countries are also deficient in iron and iodine also. So check the multivitamin to see which of those it has, then purchase separately the ones it doesn't have. I often had to use 2 or 3 different ones in order to get all those things into the dog.

Amitraz ('Mitaban', 'Taktic')

But if you suspect the very common Sarcoptes---red inflamed skin and intense, 'constant' itching and scratching with patchy hair loss---and you give the two doses of Ivermectin at two week intervals, then if the dog doesn't get better from those two doses of Ivermectin, then he may have Demodex mange which will require weekly dips with amitraz dips weekly or Ivermectin every day---or every other day--for 6 weeks or longer. Amitraz is preferred and is the only method approved by the FDA in the United States. You give the dog a dip in Amitraz (**'Mitoban', 'Taktic'**). Follow directions, mixing 10 mls per 2 Gallons water and, using kitchen gloves that cover your arms, you pour the liquid on the dog and use a sponge to sponge it on the hard-to-reach places. (Send me an email and will send you the section from Plumb's Veterinary Drug Handbook which explains the different ways to use Amitraz---very valuable info you won't readily find on the internet.) Besides pouring the Amitraz/water solution on their bodies, you need to pour some in the cut-out bottom of a plastic bottle or a bowl and put each of the dog's feet in it for a a minute or two: the mites hide out in the feet so killing them in their hideout is important. If you do this once per week for 6 weeks, or even once per two weeks for a total of three treatments, you will cure most Demodex mange; but it could take longer (see Plumb's). This is a bit of work but it is often less work than trying to return to that one dog every single day (or every other day) for two months to give him Ivermectin. I believe Demodex mites damage the skin so much---looks like elephant skin, very tough---that Ivermectin in the blood stream has a hard time reaching the Demodex mites---which is probably one reason Amitraz is the only 'approved' method in the USA for Demodex. But sponging on Amitraz/water solution does reach the mites and kills them fast. **I have seen Amitraz start to 'work' within one week of the first dip**---hair starts to grow back, animal looks happier, wags his tail, more energy---whereas the same animal had no or little hair grow back even after a month or more of daily Ivermectin. This is one reason **Amitraz is considered the 'gold standard'** of treatment for Demodex mange, and is the only approved treatment for Demodex by the FDA in the United States.

Amitraz is also very useful if you have a dog covered in ticks, because you don't want to pull the ticks off as it is too time-consuming and dangerous for the dog because pulling ticks can mean squeezing pathogen-laden stomach contents of tick into dog. Just put one-half cc of Amitraz in a quart water bottle full of water and, using gloves, sponge the mixture on the dog. The ticks will fall off immediately with the Amitraz/water solution.

And it is a good idea to give antibiotics every day to a dog with no hair or with inflamed skin and/or sores during the time you are treating him for mange, because the dead mites and mite feces under his skin are causing infections

Ivermectin: Oral versus Injection

I only use oral administration. You don't want to try and inject a dog that has other dogs jumping around him and you, there is just too much room for error, accidental needle sticks, contaminated needles, etc. Trying to change needles for each dog is an extreme hassle when dogs are crowding around you, etc, not to mention that most dogs really don't want you sticking a needle in them. Oral ivermectin is what the vet books specify for Demodex and for Sarcoptes mites they say you can use, and I quote, "oral **OR** injection". **It is simply not necessary to inject.**

But for most of the dogs you can just squirt it in the back of their mouths using a 1 cc syringe without the needle. You can also open a capsule of antibiotic—(Cephalexin or Amoxicillin see below) and—if you can't get close to the dog to shove the pill in the back of its mouth--then pour the antibiotic in the milk, too, if the dog has scabs/infection. Most hungry dogs will drink both Ivermectin and antibiotic together if they are mixed in a little milk.

Injecting the dozens of temple dogs I treat is, for me, out of the question for several reasons: difficulty injecting 'uncatchable' dogs, risk of dirty needles in a field environment, assistants reusing dirty needles, dog bites, needles breaking, needles breaking in dog, accidental needle sticks in yourself from 'chaos' of dogs crowding around you, the expense of needles, the need to first swab the injection site with iodine or alcohol which may make the dog run away before he ever gets any medicine.

But, more important, **why inject at all?** The following is from the Merck Veterinary Manual, (available for reading, free, online, www.merck.com). It gives these Ivermectin recommendations for treating the two kinds of mites (mange).

Sarcoptic Mange (canine scabies): *"Ivermectin 0.2 mg/kg ('zero point 2 mg per kilogram is the same as 200 micrograms per kg'), PO (Per Os, 'by mouth') or SC (subcutaneous), 2 treatments 2 weeks apart."* (Merck Vet Manual)

(PO= per os/by mouth; SC= Sub Cutaneous injection). **Note the word 'or' in their recommendation** of oral (PO) versus injection (SC). They do Not say 'use only injection'.

"Demodectic Mange: 0.3-0.6 mg/kg (300-600 micrograms/kg) PO (by mouth), SID (once per day) until cured."

Note there is no mention of injection for daily treatment of Demodex mange, only oral, because, for one thing, that would mean injecting the animal every day for a month or longer, using a new needle each day.

So you see the Merck Veterinary Manual says that it is fine to give **the Ivermectin PO**, Per Os, that is, **BY MOUTH. Orally.** And only give it orally for Demodex mange. And for Sarcoptes mange, **orally is fine.**

Since I'm dealing with temple dogs and cannot do laboratory skin scrapings with microscope I cannot tell for sure when they are cured of Demodectic Mange, so a 6 week (or longer) daily treatment is what I do. (Or I don't use Ivermectin at all for Demodex mange, but give weekly or bi-weekly Amitraz or Lime Sulphur dips/baths.) Fortunately, most dogs in Thailand seem to have Sarcoptic Mange which only requires 2 oral Ivermectin treatments 2 weeks apart, but I often give 1 treatment per week for 4 weeks to be on the 'safe side' and because I may forget which dog I've given the meds to since I am treating a dozen or more dogs which may gather around me at one time.

I did see on the internet that there are reports of curing Sarcoptic mange with one treatment only, at the higher dose range. This is encouraging as I sometimes run across a dog I may never see again and so even giving Ivermectin once may cure their mites. In this case, I would use the 0.5 up to 0.6 mg/kg.

The less-than-pencil thin 1 cc syringe is great also because it is so small you can slip it (without a needle) between the teeth easily to squirt in the back of the mouth. If you squirt in front of the mouth the dog can more easily spit the medicine out.

Milligram (mg) versus Microgram (mcg)

METRIC System (mcg, mg, kg, etc)

One kilogram contains 1,000 grams.

One gram has 1,000 milligrams (mg).

One milligram(mg) has 1000 micrograms (μg , mcg)

A microgram is very, very tiny, only one-thousandth the size of one milligram (and one millionth of a gram). So a microgram is a thousandth of a thousandth. For example 0.2 mg (zero 'point' two milligrams) is the same thing as 200 μg (mcg, micrograms). I know it can be confusing because dosage recommendations are often in milligrams OR micrograms, and you have to differentiate them.

Because **Ivermectin** is usually a 1% solution—look on the bottle to make sure, as that is what you want, 1%--that means that there is 1 ml (milliliter) which is also 1 gram of ivermectin in the entire 100 ml bottle. (1 ml of water weighs 1 gram. water is mostly what is in the bottle). So in a 1% solution there is one gram of the actual medicine. One gram is 1000 mg. 1000mg in 100 ml bottle works out to 10 mg in each ml/cc (1000mg per bottle divided by 100ml each bottle equals 10mg per ml). **So each 1/10th (one-tenth) of a ml/cc is one mg of Ivermectin if your bottle says 1%.** Note a ml—milliliter--is equal to a cc, cubic centimeter. That is, one ml equals one cc, so you can use ml and cc interchangeably. So when you've withdrawn **a full 1cc that would be 10 mg of Ivermectin** which would be the right dose for a 20 kg dog (20kg x 0.5mg/kg) but too much for a 10 kg dog (but you will NOT hurt the 10kg dog with that 'overdose' because Ivermectin has a very wide margin of safety—see Data Sheet at end of Manual.

Now perhaps you see why it is important for you to use only a one cc syringe for Ivermectin because it makes it easier to get the dose right. But once you are comfortable calculating doses correctly, then you may want to use a 3cc syringe, especially for dogs 25kg and larger who have demodex mange because they will require more than 1cc per day. 25kg x 0.5mg/kg is 12.5mg of Ivermectin equals 1.25cc (1.25ml). But even in those cases I personally still use only a thin 1cc syringe and I first give that 25kg dog a full 1cc and then I give them another quarter cc

Re: Ivermectin: the dosage range is 0.2 up to 0.6 mg/kg (which is a wide range), *"...it seems that **higher doses do clear (demodicosis) infection faster than lower doses.** This means that if a lower dose has been ineffective, a higher dose may still work."* (From www.marvistavet.com). But, as discussed before, it is preferable to dip a dog with demodex in Amitraz rather than giving them daily Ivermectin

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for months. For dogs with Sarcoptes mites I give all dogs 0.3 up to 0.5. But if a dog has demodex mange then you want to give the dog the higher dose, 0.5 up to 0.6 mg/kg—that is, if you choose to use Ivermectin as your way of treating a dog with Demodex. For Demodex treatment dipping them in Amitraz weekly is superior to Ivermectin daily.

The generic Ivermectin works great, but just be sure your bottle and box has two things on it: 1) it says 1%, and 2) it has the name and address of the company who made it. I have, unfortunately, in Thailand seen bottles that did not have a company name but more important did not say 1%, in fact it said 150mg. Whoa!!! I explained above that a 100ml bottle must have 1,000 (one thousand) milligrams of Ivermectin if it is 1%. I found these bogus bottles in a pharmacy for humans, which pharmacies usually do not carry Ivermectin. If you get yours from or through a vet—or a vet supply company—you will be fine. The animal feed and supply stores 'should' carry bottles with company name and that say 1%. There are Ivermectin powders available for mixing with water but using the pre-made bottles with liquid sounds a lot easier than opening a packet of powder and then trying to mix it correctly, and those powders are more expensive than just buying a bottle.

Remember: each 1/10th (one tenth) cc/ml is one milligram (mg)--or 1000 micrograms (mcg)--of ivermectin (if you are using 1% Ivermectin). Using a one cc/ml syringe is more mistake-proof, or more manageable when you've got temple dogs jumping on you, licking you, distracting you, etc and you're trying to figure out the correct dose.

Ivermectin: how to calculate by dog weight

2 kg dog with sarcoptes mites (mange: i.e. red inflamed skin, patchy loss of hair, intense itching/scratching) $2\text{kg} \times 0.3\text{mg/kg} = 0.6\text{ mg}$ Ivermectin which equals to less than 1/10th cc. Since you're only using 1cc syringes then just draw a tiny amount of Ivermectin into the 1 cc syringe, less than one-tenth the way up, less than 10% of the way 'up' the syringe for a 2kg dog but if you fill to the 10% mark (0.1 cc) then that is not too much (Ivermectin doses range from 0.3 to 0.6 mg/kg). Do Not use Ivermectin on puppies less than 6 weeks old.

5kg dog $5\text{kg} \times 0.3\text{mg/kg} = 1.5\text{ mg}$ Ivermectin which is under 0.2 on the syringe.

A 10 kilo dog with Sarcoptes Mange—a third way up the 1 cc syringe-- $10\text{ kg} \times 0.3\text{mg/kg} = 3\text{ mg}$ or 1/3 of a 1cc syringe.

A 15 kg dog $15 \times 0.3 = 4.5\text{ mg}$ equals 0.45 of a cc, that is, about half the way 'up' the 1cc syringe.

A 20 kg dog $20\text{ kg} \times 0.3\text{ mg/kg} = 6\text{ mg}$ equals six tenths the way up the 1 cc/ml syringe.

A 30 kg dog $30\text{ kg} \times 0.3\text{ mg/kg} = 9\text{ mg}$. That is, nine-tenths the way up the 1cc syringe.

The above doses are for Sarcoptes mange—the kind you will mostly see that produces intense itching, red inflamed skin, patchy loss of hair. I often used 0.5mg/kg for all dogs. Note: if you give 0.5

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mg/kg—which is a higher dose than the 0.3mg/kg one I outline above—it is okay but it helps to be able to estimate the weight fairly accurately. Practice by weighing some dogs so you can really get a ‘feel’ for how much they weigh.

Safety of Ivermectin

But if you give a dog too much, you won’t hurt them. For example, if you are using the 0.3mg/kg amount as ‘THE’ number you’ve chosen, and then you make a mistake and give the dog *twice* that amount, you are still ‘okay’ because, remember, Ivermectin is recommended in a range, from 0.2 up to 0.6mg/kg. But Ivermectin has a very wide margin of safety in most breeds, making it very difficult to overdose the dog, even with a much, much higher dose than that. Doses start to get deadly at 20mg/kg, which is *40 times* the amount you are giving them! Because, remember, you’re only giving about *a half* mg/kg, so you would have to give them *10 times* that amount to see trembling and *40 times that* to see life-threatening symptoms. (see Ivermectin info at end of this manual) **Remember, don’t give Ivermectin to long-haired whippets, certain shepherds, Collie or collie mixes or English/Shetland sheepdogs, and their crosses, and certain Shepherds, unless your are just giving one drop, the monthly prevent-heartworm dose.** (See Ivermectin Data Sheet at end of manual.) One or two drops is okay in these breeds monthly for heartworm prevention but do not give more than a drop or two per month. Fortunately, most dogs in poor countries are ‘mutts’ and so the risk is low you will encounter one of the sensitive breeds.

You may treat a dog that is so messed up you just can’t tell exactly how many of which diseases it has. Maybe the dog has sores, pus, hair loss, inflamed skin. In this case just 1) give worm pills 2) give Ivermectin 3) give antibiotics 4) give prednisolone and antihistamine (chlorpheniramine or diphenhydramine (‘Benadryl’) 5) put flea medicine on him but wait several days after a bath to put it on 6) feed him and 7) give him a bath with special shampoos (see below).

Bathing

After giving a bath with a good dog shampoo containing **salicylic acid, coal tar** and/or **sulphur**, I then also—if the dog’s skin is in really bad shape--dip the dog in **Sulphur dip** also known as **LimePlus Sulphur** dip. It smells like rotten eggs but it is the oldest known pesticide and it greatly speeds the healing process on dogs with severe skin problems. It costs maybe 6-7 dollars to treat one dog and it is non-toxic, even though it is a pesticide. You may have to shake the bottle really well before pouring it out because it can crystalize on the bottom. If your bottle is old and has many crystals, no problem, just shake really well, maybe mixing it with some water. Follow directions on bottle to mix with water, then pour on entire body. Do not rinse off or towel dry. Let air dry. LimePlus Sulphur can stain clothes and furniture, so leave dog outside until dry.

If I can’t find a shampoo with all the ingredients in it then I will buy several different kinds so I can have all those ingredients to bathe him in. But if I can’t find any of those ingredients then I just use soap and water. I will often open several bottles of the different shampoos—**coal tar, salicylic acid, sulphur, a tube of benzoyl peroxide**—and squirt a glob of each one onto the wet dog. Make sure the dog has a

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choke collar on his neck that is attached to a leash and the loop end of the leash is looped securedly around your arm so you don't have to use a hand to hold the leash. You don't want the soaped-up dog running away before you finish. Leave shampoos on for 10 minutes, rubbing it in, massaging the skin, then rinse. If the dog has Demodex, and if you're dipping in either Amitraz or Lime Sulphur, also have the dog put each foot in a bowl of the mixture and let his foot stay and soak in the bowl for a minute or longer. Do not rinse off or towel dry the dog with lime sulphur or Amitraz. Let him air dry.

Occasionally

I'll need to sedate a dog that desperately needs a bath, if that dog won't let me give it bath without sedation. I got to try some acepromazine (ACE) on several dogs and that stuff works great. I also have valium which is relatively easy to get at a local pharmacy. One dog needed to be knocked almost all the way out because he wanted to bite and struggle. But other dogs just needed a little valium to calm them down. Like the little Shitzu whose owners let his hair grow so long that it was so hardened through being all wadded up and matted, that he couldn't scratch the 100 huge ticks that were living under the hardened hair balls, so the ticks had 'cover' and 'concealment'. When I cut the dirty, filthy hardened hair wads, the engorged ticks hiding inside the hair balls were being cut too: not a pretty picture.

Gloves and rabies.

How getting bitten in Bangkok helped me later when I began caring for dogs.

I had rabies vaccinations after I was bitten by a street dog in Bangkok who then ran away after he bit me. So I was 'forced' by this dog to get the rabies vaccinations plus Rabies immune globulin (RIG). This incident happened before I began caring for dogs and it was a good thing he bit me because it made me get the vaccinations which helped to protect me once I started caring for many dogs and getting so much dog saliva on my hands, as well as getting bitten again by other dogs. I'm making an effort to try and always wear surgical gloves, but even these get torn. I try to wash my hands frequently when I'm traveling from one group of dogs to the next. And you should definitely, without a doubt, get the prophylactic rabies vaccinations before you start caring for dogs in a poor country. For the pre-exposure prophylaxis you only need 3 vaccines on days, 0, 7, 21 (or 28). But if you are bitten before you've had these 3 pre-exposure shots then you will need not 3, but 4, rabies vaccine shots Plus another shot of the expensive Rabies Immune Globulin (RIG). (see Rabies section end of manual) Wear surgical gloves especially when you're putting your hand in or near their mouths and especially if you have any cuts or scratches on your hands. I confess I don't always wear gloves and I got lots and lots of saliva on my hands over the years (but only when I had no cuts or scratches—then I definitely wore surgical gloves). But I also had already received the vaccines so I wasn't as worried, although it is common knowledge you should never rely on only the vaccine you have received. The most important thing to do when bitten or saliva gets in a cut or scratch, is to thoroughly wash the wound with soap and water for 10 minutes.

The most important thing to do if bitten is to immediately wash any bite wound for 10 or more minutes with soap and water, and alternate the washing with iodine and hydrogen peroxide.---these things you should do before you go to the hospital because you can remove many rabies virus

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particles by washing and scrubbing. A dog bite is not a medical emergency, unless bitten a lot on the face or neck, especially the face of children, so your priority is to wash the wound first and then go to the hospital for the rabies shots you may need. Rabies is transmitted through saliva into an open wound or mucous membrane, and there is a lot of rabies in Thailand and other poor countries. Thousands of people die every year from rabies in poor countries, but it will not be a problem for you if you are bitten if you 1) wash the wound thoroughly and then 2) check with a doctor to see which if any post-exposure shots you need. See the more detailed discussion of rabies at end of this manual. I have been bitten by dogs I was already familiar with and saw everyday and I did not go to the hospital for additional booster vaccinations, because it was highly doubtful those dogs I knew had rabies, though I made a point to see them every day after that and if they developed any signs of rabies I would then go for additional vaccinations. But, remember, I had this luxury of deciding not to go to the hospital because 1) I already was vaccinated 2) I washed the wound thoroughly and 3) observed the dog daily for the following 2 weeks. When I was first bitten in Bangkok by a strange street dog who bit me for no reason and that I figured I wouldn't ever see again, I did indeed go to the hospital for my very first series of Rabies vaccinations plus I got one shot of Rabies Immune Globulin (RIG).

Teaching people to provide **fresh water** for dogs is important. I talk to monks at temples and get each temple to give me 20 or so orange buckets—the ones Thais buy full of food, soaps, etc to donate to the Monks at the temples. We then write, in Thai, with indelible marker on side of bucket: “Gift from (name of Wat) for your dogs water. Please change water every day. Thank you.” We then give these buckets to anyone and everyone. I also teach the monks how important clean water is and for them to use these buckets for water, too, as many temple dogs don't have access to clean water. It is my hope that this idea of reusing the zillions of these orange buckets will ‘catch on’.

Scabies in humans; Ivermectin one cure for scabies mites in humans.

Several studies on humans have demonstrated that ivermectin is just as safe and effective as topical antiscabietics. In these studies, single oral therapy with dosages ranging from 100 to 200 micrograms/kg resulted in cure rates that ranged from 70% to 100%. In a study comparing oral ivermectin and permethrin 5% topical cream, two 200 micrograms/kg doses two weeks apart were required to achieve the cure rate of a single application of permethrin, which was 97.8%. Despite these studies, the optimal dosage for scabies has not been established due to paucity of randomized trials and the lack of longterm experience of the drug in humans for scabies. Data from the limited number of studies indicate that two doses of 200 micrograms/kg of ivermectin 1 to 2 weeks apart achieve the comparable cure rates of topical antiscabietics. Single dose failure is assumed to be, in part, due to survival of the eggs leading to re-infestation. Some report successful experience with single 250 mcg/kg and 400 mcg/kg dosages, which avoids the second dosage. (“Current trend in ivermectin usage for scabies” by Anthony F Santoro, Journal of Drugs in Dermatology

Note that Ivermectin taken orally by a human can also help kill a **bedbug** infestation in your house because when the bedbugs bite you they die from the Ivermectin they ingest from you. But you still need to attack the bedbugs with the pesticide sprays, diatomaceous earth powders (sprinkled around

points of bed that contact floor, etc), washing all clothes, sheets, bedding in hot water and searching around mattress edges and seams, curtains and furniture close to bed for their sleeping places.

Additional notes on Ivermectin.

Half-life in dogs is about 24 to 36 hours. That means after 24 or so hours, half the medicine you gave the dog is still circulating in his body. Highly toxic to aquatic life. As ivermectin is extremely dangerous to fish and aquatic life so treated animals should not have direct access to surface water and ditches during treatment.

How Much to Spend

I sometimes find myself having to choose between spending a lot of time and money on one dog or not. For example, a Thai friend brought me to a house of some very poor folks who had a dog in a small pen—1.5 meters x 1.5 meters. The dog was very old, almost toothless, blind and deaf and had a hard time walking because of the blindness but also because she was debilitated in her muscles and nerves and probably brain, too, as she seemed to have dementia. Certainly, tick born infections can cause dementia just as syphilis can in a person and, this being Thailand, she had had a heavy tick burden for years. She had been in this pen for years, constantly bitten by mosquitos, fleas, mites, ticks, etc. Her feces was picked up but there were still remnants of feces and plenty of urine in the soil she was on. I took her home with me and cared for her, thinking maybe lots of good treatment, food, meds, etc could heal her. I am sure a more experienced person would have seen the hopeless nature of this case. It turned out she also had a tumor growing rapidly on her gums. In nature, when an animal gets sick like this, nature doesn't then just summarily execute (euthanize) the animal. Rather, the animal dies, sometimes slowly, and sometimes painfully. I spent a great deal of time and money and energy on this one 'hopeless' dog, and I did this at first because I thought there might be a chance to transform her into being not so debilitated, but then as it became obvious she wasn't going to improve I continued the caring because I wanted her to have, before she died, what she hadn't had before: some love, and attention, medicine and good food. The tumor was growing rapidly and was probably not just in her mouth. Toward the end she started howling terribly in pain, and so I called a guy from a local animal rescue organization who I knew had some sodium pentobarbital and we euthanized her and ended the terrible suffering she was experiencing at the end.

I learned a lot from her about this sort of debilitation. But all the energy I devoted to her took me away from caring for other dogs who would have benefitted more. (Yet I learned a lot about this sort of debilitation. And this is a decision you will have to make: to spend too much energy on one dog—especially if 'hopeless'—or instead to concentrate your resources on helping many others instead of just one. This is called '**triage**', and it is used in emergency rooms for humans, especially during mass casualty events or war, where patients need to be put into one of three groups

- 1 Those who are likely to live, regardless of what care they receive;*
- 2 Those who are unlikely to live, regardless of what care they receive;*
- 3 Those for whom immediate care might make a positive difference in outcome."*

You will have to make this 'triage' decision because you may have to decide how much, if any, care you are going to give to any animals in group 2.

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I once spotted a Golden who looked ill, and met the very poor people who owned him. His stomach was distended and I took him to the vet who, with a long needle and very large syringe, aspirated a great deal of fluid from him. The vet told me his liver was very messed up. I brought him back to the vet several times for this treatment, and the vet told me the only chance of saving him would be expensive surgery in a town far away and the vet said there was only a chance that would save him. I elected not to try to do this surgery because it would cost a great deal of money with an uncertain outcome, and the money required for that one surgery was money I could use to heal dozens or hundreds of dogs. Like many Thai households, there were pesticide containers lying about the yard, and I believe they were using one of those plastic containers for his water bowl. Pesticide exposure is rampant in Thailand, for animals and people alike. So I believe that is why he was sick. This was before I knew that you can use NAC and silymarin (or Milk Thistle, which is where silymarin comes from) etc to help a diseased liver. (see discussion of poisoned dogs elsewhere). Yet even some cases of liver disease are incurable, and this dog was probably one of them. And even if the expensive surgery had helped him, he would have gone right back to the same house where he was probably drinking contaminated water and I would have lost the money I could use to help dozens or hundreds of other dogs.

Poisoned Dogs

A common method of dog ‘control’ in Thailand is to poison the dogs. The fact is, there are too many dogs in Thailand and no spay or neuter programs. Before when I saw a dead dog on the side of the road from a car accident, I felt ‘sad’. Now, I realize that that dog’s death is part of ‘nature’ here, and is not something to be mourned, at least for long. A Buddhist monk, riding with me, remarked: “His suffering is over”. Also, the stray dogs here—even if they only live a year or three—probably have fuller, more exciting lives than sheltered, fenced-in dogs in the West who have no other dogs to play with, who seldom get out of their yards or apartments and who are, I suspect, a little crazy because of this confinement. In the West all these stray dogs would be rounded up in a heartbeat and ‘euthanized’--killed. (In the USA up to two million healthy dogs and cats are euthanized yearly in shelters). But in Thailand they are at least given a chance at a life, replete with all the things that life has to offer, including suffering. Still, a slow poisoning death is not something I like and I try to save them, of course. This is yet another reason to promote the inexpensive, non-surgical calcium chloride method of sterilization for male dogs. It doesn’t require years of medical school---I believe a non-vet can be trained to do it. But most countries will not officially allow anyone but a vet to do this procedure, so we need to change that if we want to address the suffering of hundreds of millions of unwanted dogs.

Activated charcoal Can save your life and the lives of poisoned dogs.

Activated charcoal is the number one protocol in emergency rooms worldwide for poisonings of humans and animals alike. But it should not be given to animals or humans who have ingested caustic materials like bleach or lye. Caustics are not absorbed systemically, and the charcoal may make it more difficult to see oral and esophageal burns. Other chemicals that are not effectively adsorbed by

activated charcoal include ethanol (drinking alcohol), methanol (toxic alcohol), fertilizer, fluoride, petroleum distillates, most heavy metals, iodides, nitrate, nitrites, sodium chloride, and chlorate.

If you suspect food poisoning in a human (or dog) then you only need to eat a handful of capsules, and not the large doses prescribed for massive poisonings of other types (see below). Often, in foreign countries, many local markets, shops and pharmacies will sell blister packs of activated charcoal. But if you are traveling in a foreign country it is always a good idea to have a bottle of Activated Charcoal with you at all times, so you can swallow 3, 4 or 5 at the first signs of food poisoning (headache, malaise) or later when you have vomiting and/or diarrhea. Eat some capsules every four hours after the first dose for a day or so. But if you suspect having swallowed a poison other than tainted food, then use the dosages described below.

Emesis (vomiting)” is contraindicated (in other words, don’t make them vomit) with ingestion of alkalis, acids, corrosive agents, or hydrocarbons due to the risk of chemical burns or aspiration. The pre-existing condition of the animal also determines the indication for using an emetic. Emesis should not be induced at home in an animal that has a history of epilepsy, cardiovascular disease, or is debilitated. Veterinary supervision is recommended in these situations. Recent histories of abdominal surgery or potential for a gastric torsion are other factors that could make emesis a contraindication. It may be safest, depending on the situation, to induce vomiting in brachycephalic (short-nosed) breeds at the veterinary hospital versus at home due to aspiration risk. Emesis should not be attempted if the animal has already vomited or is exhibiting clinical signs”. ASPCA Animal Poison Control Center
<http://www.apcc.aspc.org>

So, basically, forget making the dog (or human) vomit. (unless they very recently ate the poison AND they are fully conscious AND they have good reflexes). Instead, just empty a bunch of charcoal capsules into some milk or, better yet, chicken soup, shake it for a minute or more, and let the dog drink it. If you can ‘pill’ the dog then ‘pill’ him with many charcoal capsules, one after another. But also use chicken soup made with salt and sugar (or rice), and open the activated charcoal capsules into that. Plus the liquid of the soup helps in rehydration, which is a cornerstone of emergency medicine treatment. For a patient--dog, cat, human--who has ingested most types of poison it is important to give them **1g/kg activated charcoal** orally in a drink (shake for a minute or more) as their first dose. Repeat with 0.5g/kg every 4-6 hours for 3 additional treatments (**Multiple Dose Activated Charcoal—MDAC**). “If the patient vomits the dose of activated charcoal, it should be repeated...An antiemetic may be needed”. (antiemetic: drug to stop vomiting) (Goldfrank’s Manual of Toxicologic Emergencies”)

ER docs usually will not usually induce vomiting because there is a danger of aspiration and the vomiting can delay giving Activated Charcoal. But there still may be times when you should make the patient vomit--if you know they just swallowed the poison, for example. Some drugs can have anti-emetic effects (makes vomiting difficult). Examples of such drugs include phenothiazines, antihistamines, barbiturates, narcotics, antidepressants, and marijuana. It is important when taking the history to find out if the animal has been taking these or any other medications. But sometimes you do not want the patient to vomit. For example, when you’ve given activated charcoal, you don’t want the patient vomiting it back up.

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Emetic (to make vomit) Agents: You can **use hydrogen peroxide** before giving charcoal. Only use this if you know the dog (or human) *recently* swallowed the poison and if the dog is 100% conscious. Making the patient vomit may delay your ability to give activated charcoal, especially if the patient continues vomiting (which is one reason Not to use syrup of Ipecac). So do not make the patient vomit unless they very recently swallowed poison, within an hour or two, and you feel the risk of inducing emesis is worth it.

Three-percent hydrogen peroxide is an effective emetic for the dog, pig, ferret, and cat (or human). Do not induce emesis in rodents, rabbits, birds, horses, or ruminants. The dosage is 1 **teaspoon** per 5 lbs., not to exceed 3 **tablespoons** (1 tablespoon has 3 teaspoons). It should be administered undiluted – not mixed into water or food. However it is helpful to feed a small, moist meal of either canned food or a slice of bread before inducing vomiting, as it makes emesis more productive by giving the toxicant something to adhere to. Bulb syringes, feeding syringes, or turkey basters aid in administration. Put the syringe (with no needle) or bulb/etc with Hydrogen Peroxide far back in his throat and squirt. Or, have some plastic tubing handy and ‘push’ the tubing far back in his mouth and then—using your mouth if you have to—squirt the hydrogen peroxide down the tube into the back of his throat. He will probably vomit instantly. Hydrogen peroxide causes vomiting through mild gastric irritation. Vomiting usually occurs within minutes and can be repeated once if not initially successful at causing emesis. Important to get the hydrogen peroxide in the back of his throat to insure he swallows it. If you just squirt it into front of mouth he may just spit it out.

Oral Rehydration Solution (ORS)—Homemade Gatorade

How to replace fluids/electrolytes in a dog or a human without an IV, thereby saving their life.

As the emergency medicine doctors say, “Volume is supreme”, meaning the importance of the fluid volume in the body and the life-saving nature of fluid and electrolyte replacement. (Sodium—from salt—is THE major electrolyte of the body). **Volume (fluid/electrolyte) replacement is at the cornerstone of all Emergency Department care, for either animals or humans.**

In the ER, though, the medical personnel have IV equipment and they can administer the bottle of drip-drip saline IntraVenously (IV). You will probably not have IV equipment with you. Time is of the essence, so if you don’t have IV equipment you can make life-saving ORS (Oral Rehydration Solution—which can also be given rectally if the animal or human is unconscious).

For humans the ORS recipe is:

1 liter (quart) water

2 TABLEspoons (TBS) sugar

½ TEAspoon (tsp) salt (Note: adding a little lemon or lime juice makes this taste like a sports drink but not nearly as sweet. Also note if you do not have salt and sugar available, you can drink plain water and eat salty chips—chips are carbohydrates that will ‘turn into’ sugar when you eat

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them). Go to www.rehydrate.org to learn other ways including rice gruel for infants with life-threatening diarrhea.

For dogs/cats: the ORAL recipe is:

1 liter of homemade chicken soup made with
2 TABLEspoons sugar
½ TEAspoon salt

For dogs/cats: the RECTAL recipe is:

Same as human ORS recipe, that is, 'plain' homemade Gatorade made withOUT chicken soup.

If the dog/cat (or human) is unconscious then you will not be able to get him to drink the 'chicken-soup' ORS unless he wakes up after you put a few drops on his lips and tongue (I've seen this wake a dog from a coma). But if he doesn't wake up, and **if you do not have an IV**, then your last alternative is to make just regular ORS (water with salt and sugar only, but no chicken soup) and **administer it rectally to either a dog, cat or human**. You can use a 60 cc syringe (without the needle of course; or an enema bag; or a Camelbak, or any plastic tubing, straw, etc). You **do not need sterile water** for rectal or oral administration of the salt/sugar combination, as you do for IV saline. Rotate the human or animal patient on his/her side, and place something under the lower part of the body to raise his hind quarters which aids the flow of fluids. And if you're squeamish about doing it, then remember that the life of the patient depends on these fluids. Some very sick dogs may take a liter of fluid, or more, and humans with massive diarrhea can take many liters over the course of their illness but do not rush to put that much in too quickly—space out the administration so you don't fluid-overload them.

But, if the patient (dog or human) is in allergic shock---from a bee sting, for example---**then you do in fact give them a bolus (large amount)** quickly because in allergic shock up to 50% of the fluid in blood can flow out of the arteries and veins within 10 minutes of the onset of being bitten, etc. The bolus dose given rectally or IV (or oral if they will drink) is 10-20ml/kg. So **if the dog weighs 10kg (22 lbs)** then, if we use the 'higher number 20ml/kg that would be 10kg dog weight x 20ml/kg = **200ml given over 10 minutes**. A 20kg dog would be twice that, or 400ml (a little less than half a liter) given over 10 minutes. If given IV then you give **sterile** 'normal' saline (0.9% sodium chloride). If given **orally or rectally** water and salt does not have to be sterile but **the salt water must have some sugar in it**. See discussion elsewhere for details on recipe which, briefly, is: 1 liter/qt water, 2 TABLEspoons sugar, ½ TEAspoon salt for rectal administration; for oral, instead of plain water use chicken soup made with plain water, then add the 2 TBS sugar, ½ Tsp salt to the 'plain-water chicken soup').

Giving rectally is not a messy procedure because the fluids will stay inside the patient because there is salt and sugar in those fluids which greatly speeds to absorption of those fluids INTO the tissues and vasculature. If you do this procedure with water only then it will act as an enema and come back out the rectum, which you do not want especially since water only doesn't save their lives, but water plus salt and sugar does. But if you have IV equipment then you give saline only, with no sugar, and everything must be sterile for IV administration including water, salt, and needle. And now you see

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one of the huge advantages of ORS given orally or rectally—No sterile equipment or materials required.

For human patients including especially infants with life-threatening diarrhea, it is a good idea to catch their diarrhea and measure it and make absolutely certain you are replacing at least the same amount as they are losing. Take notes as you go, with times and amounts caught and/or replaced, so you can keep a record of your treatment. And for dogs you don't need to catch their diarrhea but it is a good idea to make notes of how much you give over what time periods.

ORS is considered the greatest medical discovery of the 20th Century in terms of number of lives saved. The Chinese discovered it over a thousand years ago but it was in the 20th Century that the underlying mechanism was elucidated (“sodium glucose co-transport system”). Several million babies (and adults) are saved per year in India alone with this salt, sugar and water combination. Without this fluid and electrolyte replacement, babies as well as adults can die in a day, two or three if their fluids/electrolytes are not replaced from the diarrhea and vomiting common in poor countries that lack clean water and proper hygiene. Giving water alone is better than no water but it will not be enough, by itself, to save the patient who has severe fluid loss. And water alone can cause life-threatening complications if the person is **low in salt (hyponatremia)**: if you give them just plain water to a patient who is already salt depleted, you can make a bad situation worse—just ask the marathon runners who were found by medical personnel sick and vomiting on the side of the race who really needed ORS but who were given only plain water—they ended up sicker, and possibly in a coma or even dead—all from lack of salt (sodium). Severe hyponatremia is a medical emergency. That is why adding the salt and sugar to the water in the correct amounts is so crucial: the salt and sugar helps greatly in fluid replacement over water alone because the mixture speeds absorption in the intestine plus it provides the all-important salt (sodium) that the body cannot function without. (see the book **Salt Your Way to Health** by Dr David Brownstein, MD)

Even without diarrhea, blood loss or vomiting, most people are dehydrated. Therefore, **ORS can help even a non-sick person become more healthy.** I encourage everyone to drink one liter (quart) of ORS daily between meals (& drink plain water with meals). You will literally feel these fluids moving into your body, rather than ‘sloshing around making you feel bloated as water alone often does. And once you’ve tasted the mixture—1 liter/quart water, 2 TABLEspoons (TBS) sugar, ½ TEASpoon (tsp) salt—you will see that it doesn’t taste very sweet—certainly way, way less sweet than sports drinks such as Gatorade and much less sweet than soft drinks, and, discovering this, you will then realize just how much sugar is often added to those ‘other’ drinks. Except Gatorade does, in fact, use the correct amount of sugar—2 TBS—but it also puts a lot of artificial sweetener in it so people will pay a dollar for a few cents worth of salt and sugar water (lifesaving ORS) which has only a very minimal sweet taste to it. Note that commercial Gatorade can definitely be used with success in humans for volume depletion, but it is doubtful a dog or a cat will drink this sickly-sweet (to them) mixture. And any drink/candy/dessert with **xylitol** in it should **NEVER** be given to a dog as xylitol can cause life-threatening hypoglycemia—low blood sugar—in dogs. Read the labels of any foods you plan on feeding your dog!

After you experience the phenomenon of drinking homemade Gatorade—and feeling it instantly move out of your stomach/intestines into the rest of your body—you may think, as I did, that humans were meant to drink this solution of water with only a small amount of sugar and salt, just enough to barely give the water the slightest sweet taste with no taste of the salt that is present. It is a nectar of sorts, and of course it saves millions of lives, whereas water alone cannot save a person with severe diarrhea, or sweating or bleeding. And all athletes who sweat a great deal are told never to drink only water, but to drink sports drinks containing salt and sugar. In both diarrhea and sweating and bleeding, salt is being lost from the body, so that salt **MUST** be replaced. With an IV, just plug in plain **sterile** salt water to the veins. But if no IV, then you have to get it orally or rectally and we now know that the salt water in the Gatorade will not effectively get into the bloodstream, etc unless there is a little sugar present in the intestines for the ‘[sodium/glucose co-transport system](#)’ to work.

When making ORS, learn to **use the palm of your hand** to hold the one TABLEspoon sugar to pour that in your water bottle, followed by a second ‘handful’ (tablespoon) followed by a ‘little pile’ (1/2 TEAspoon) of salt in your hand. You will not spill any this way, but you will trying to use a spoon in a narrow-neck bottle. But, more important, using your hands instead of measuring spoons (once you learn what the correct amount looks like) is way more intuitive and easy. **This is how two million babies with diarrhea are saved every year in India alone**—the mothers are taught the ‘hand way’ partly because they usually have no measuring spoons but also because it is easy to remember: 2 handfuls—1 TABLEspoon each time--of sugar, and one hand with a tiny little mound—1/2 TEAspoon--of salt. Use measuring spoons when you first learn this, & then you won’t need them anymore. (And you won’t spill any salt/sugar trying to pour from a spoon into a narrow-neck bottle).

Life-saving fluids for: [Ebola](#), [Dengue](#), [Cholera](#), [Parvo](#), [Distemper](#), [Shock](#), [Sweating](#), [Diarrhea](#), [Vomiting](#) and [blood loss](#).

Many ailments, including fatigue and depression, can be alleviated by giving ORS. People (and dogs) suffering from kidney problems or poisoning or almost any illness---proper hydration is essential. **Proper fluids** are the treatment for **dogs with Distemper or Parvo**. In fact, one aspect of the **Ebola** epidemic overlooked by the media is the fact that **fluid and electrolyte replacement** is the major treatment for the human diseases including **Ebola** (patient can have both vomiting & diarrhea); **Dengue Fever (virus)** vomiting; **Cholera (massive ‘rice-water’ diarrhea)**—as well as other illnesses causing diarrhea and/or vomiting.

Yet the media loved to focus on the high-tech futuristic vaccines for Ebola that of course never materialized. But the fact is **most Ebola patients recover if they are given fluids and electrolytes**. Also noteworthy re: Ebola is that the virus is in the ‘bush meat’ including antelopes, chimpanzees, fruit bats and rats, some of which meats were never properly cooked and that is how the first cases were acquired. Stories are told of fruit bats suspended over a little fire, dripping blood, but only getting partially cooked and then eaten still dripping with blood. Plus these people were often already sick and immune-compromised for a long time before they got Ebola due to their lack of soap and proper hygiene; poor diet; vitamin deficiencies; disease-ridden water; and other untreated infections such as malaria, tuberculosis, and parasites. A perfect storm. But the corporate media want us to believe we

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all have to be afraid of viruses like Ebola so they can make billions from vaccines that often don't work. Besides, there is no proven vaccine for Ebola. What is proven is: if you have proper hygiene and sanitation, good nutrition, good Vitamin D level, and you don't eat fruit bats and chimpanzees, then Ebola is not a major threat, and if someone does get Ebola, they can save their lives by drinking a lot of homemade Gatorade to replace the fluids lost from vomiting and diarrhea.

“Chicken soup ORS”: For dogs/cats, make ORS with salt, sugar and 1 liter chicken soup.

Because a dog may not drink much of the human ORS mixture, it is important that you make it, not with plain water, but with chicken soup. But if you are in a hurry then you can skip the chicken soup and try squirting regular ORS in dog's mouth but you probably won't get a dog to drink much of the ORS, so just give it rectally.

In one liter (quart) of water mix many small pieces of chicken or beef, 2 Tablespoons (Tbs) sugar, ½ Teaspoon (tsp) salt. Chicken & beef can be lightly cooked if necessary but pork and hamburger must be thoroughly cooked, Give him the pieces of meat only after he's drunk as much as he can. He'll then probably have to urinate. Then give him some more of the 'chicken soup ORS'. Give him as much of this as he can drink.

You can tell if a dog is dehydrated by touching their nose. If it is not wet they are probably dehydrated. Also, run your finger along the upper part of their gums. If their gums are dry they are dehydrated. Also, “When you push lightly on your dog's gums, a blanched area will appear. When you let go, the lighter area should return to its normal pink color within two seconds. If it takes longer, your dog may be dehydrated.” (doghealth.com)

And you can do the **skin tent test**:

“Pinch your dog's skin over the shoulders (or on back of human hand). When you release it, it should fall back into place immediately. As the tissue under the skin loses moisture, the skin moves back more slowly. In extreme cases, the skin doesn't pop back.” (humanesocietyhbg.org)

If the dogs eyes are very dry, that is also a sign of dehydration.

Every time I go to the Red Cross to donate blood, I always ask the technicians if they see **dehydrated people** coming in to donate. The techs always exclaim “yes!” And they tell me of blood so thick from dehydration/electrolyte loss that it barely flows out of the donor's body. I ask them if this isn't mostly the case with the elderly and the techs tell me they see severe dehydration in young people frequently as well. Imagine their poor hearts and kidneys having to work extra hard to pump and filter that thickened 'sludge'.

But in dogs your problem will not usually be uncontrollable diarrhea, as in humans. Your problem will be a sick or poisoned dog in need of hydration to help the body rid itself of toxins if they've been poisoned or to give life-saving fluids for shock. Note that **parvo virus** in dogs causes severe dehydration through diarrhea *and* vomiting so **dog must be rehydrated to survive parvo.**

Chicken soup in ORS can wake the 'dead'

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You can crush activated charcoal tablets (or open capsules) and pour many of them into milk, or chicken soup lightly salted with sugar or rice added, and then shake the mixture well, and let them drink from bowl. Or you can put the capsules directly in his mouth if you know how to ‘pill’ a dog. That is, if they are conscious. **Don’t put anything in the mouth of an unconscious dog.** But note, however, that even an unconscious dog will sometimes wake up if you put chicken or other meat soup drops *on his lips and tongue*. He will then drink the activated charcoal chicken soup in the bowl you have under his nose. I saved a dog once this way, a dog I just knew was dead—a hundred iridescent flies had already landed on him—but when I put my hand in front of his nose I could feel his breath. The drops of chicken soup I swear made him come out of his ‘coma’. Giving the activated charcoal in chicken soup with salt and sugar (or rice)—or in milk with a little salt added—is much easier and it helps hydrate the dog, too, fluid and electrolyte (salt) being so very important in poisoning, blood loss, diarrhea, vomiting or any illness whatsoever. If I even suspect a dog has eaten poison—say, if he is just lying around looking sick—then I give him 5 or 10 activated charcoal capsules. It is non-toxic and cannot hurt them so always better to give it to them just in case.

Signs that suggest **poisoning**

Signs that suggest **poisoning**: **mouth irritation, skin rash, lethargy, vomiting, diarrhea, lack of appetite, drooling, staggering, hallucination** causing over-reaction to sound or light, **breathing difficulty, bleeding disorders** (check gums for bleeding), **muscle tremor and rigidity, seizure**, heart failure, kidney or liver problems, coma and death. For **rat poison** (warfarin), **depression and anorexia occur in all species even before bleeding occurs.** Bleeding from warfarin-based rat poison can be seen on gums, nose, and any other orifice or wound. Always check their gums.

Always at first hint of poisoning, open many capsules of activated charcoal, and put them in milk with a little salt or, better yet, chicken soup made with a little salt and some sugar (or rice, which gets turned into sugar when eaten). Shake well. **If you know he’s been poisoned then don’t waste time making chicken soup**; get the charcoal into him as soon as possible either by ‘pilling’ him or using your milk. You can make the chicken soup later for him to drink, or you can send someone to do it while you give him fluids rectally. Make the Oral Rehydration Solution (ORS) the ‘normal’ way—without chicken soup—and give it to him rectally. (And squirt some in his mouth and put some in a bowl because he may even drink it like this without the chicken soup part.)

If he is very sick he’ll probably be lying down, but if he’s standing, no problem: The dog can be standing up as you use your big syringe—without needle, of course--- and squirt 10 or 20 or 30 ccs in him at once. Continue doing this with multiple syringe-fulls, and space out the fluid administration over 30 minutes or an hour. He may take a liter or two. Keep testing his hydration by feeling his nose, his gums, and doing the tent test (see above section on Signs of Dehydration). Once you see he no longer severely dehydrated, you can stop administering the fluids. At some point soon, though, you want to have a liter of chicken-soup-ORS ready to pour in a bowl for him to drink. And you also have a second bowl of plain water for him as well. I would not pour the entire liter of chicken-soup-ORS in the bowl at one time for fear of spillage. Give him a bit at a time, as much as he wants to drink, even if you’ve already given him fluids by any other route. When he stops drinking, then pour a bit more in

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there, leaving the rest in your bottle. Other dogs may be hanging around wanting to drink his soup. But leave plenty of plain water available at all times.

If you can determine the poison he ate then you can give the antidote, if there is one. Usually they will have eaten an organophosphorous or carbamate pesticide in which case you give them atropine intravenously (IV) and/or subcutaneously (SC). If you see bleeding gums, or blood coming from other places, then the dog may have eaten warfarin type poisons (rat poison) in which case you give them Vitamin K1 intravenously (IV) if they are unconscious or oral if they are conscious (mix with salt/sugar chicken soup), or rectally if you have no IV and they are unconscious. Note that rat poison is not used much to poison dogs because the dog usually must eat the lower-strength bait for some days in a row for it to be lethal. Still, it is good to look at the dog's gums and elsewhere for any unusual bleeding, especially since the concentrated formulas can cause problems much sooner than a few days.

“Atropinization (you've given enough atropine) is adequate when the pupils are dilated, salivation ceases, and the animal appears more alert”. (Merck Vet Manual)

After you've given the charcoal and the IV atropine and the oral Vitamin K1 (Vitamin K-1 usually not necessary but can't hurt, especially if you suspect rat poison). Then give them some or all of the following to counteract the toxicity to the liver:

NAC (n-acetyl cysteine), an amino acid which replenishes glutathione in the liver and which you can possibly buy in a pharmacy or health food store in a foreign country, though I always make sure and bring bottles with me when I travel to Thailand. It is extremely important in many poisonings to give NAC. NAC is the antidote for human poisonings with Tylenol— also known as: paracetamol & acetaminophen (but you must also give tremendous quantities of activated charcoal every 4-6 hours for days to a Tylenol patient). Also, give **Silymarin**, the active ingredient in the **herb 'milk thistle'**—or you can just give the milk thistle, because either silymarin or milk thistle can help a damaged liver repair itself; Carnitine (another amino acid), and Vitamins K, E, A. And essential is to **give fluids**, especially chicken soup with salt/sugar (or salt/rice) as outlined above.

Aflatoxin on dog food

One poisoning incident that bears telling is 50 or so dogs ate some dried dog food at a dog rescue organization in Thailand and they all fell ill, and most died, because the dogs weren't treated with activated charcoal, NAC and rehydration in time. The food had **aflatoxin** mold on it, but the mold could have been invisible or hard to see. If you suspect this kind of poisoning then the antidote is always activated charcoal and chicken soup ORS and an IV saline drip, (if available). Since aflatoxin is toxic to the liver you must also give oral NAC and/or Silymarin (milk thistle), then, if you have them, carnitine, Vitamin A, E, K. and of course oral chicken soup with salt & sugar for rehydration or just plain ORS (no chicken soup) given rectally if the animal is unconscious. But remember if you give the charcoal and NAC together that you will have to give more NAC without the charcoal later, even multiple times later. And you can administer the NAC, Silymarin, carnitine, vitamins, etc rectally if animal is unconscious and you don't have sterile meds and IV equipment. Crush tablets and open capsules into the ORS that you administer rectally. You may not be able to find the silymarin/milk

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thistle or carnitine in poor countries but you can probably find the NAC (N-acetyl Cysteine) in a pharmacy or health food store, but certainly at a hospital as NAC is the antidote for Tylenol (acetaminophen, paracetamol) poisoning. A vet may give the NAC via IV, but it is safer given orally. I am not even sure vets in poor countries have IV NAC anyway.

If pupils are tiny (miosis) and animal has secretions from lung, nose, mouth or eye then you can start with a little atropine IV (or SC) and observe to see if tiny pupils become larger and/or if lung/nose/eye secretions dry up. SC is Subcutaneous and using SC route is great if you don't know how to find a vein. To administer SC: lift up the fold of skin over the shoulder blades and inject under the skin there after wiping area with alcohol or iodine. If you know for sure it is the very commonly used carbamate or organophosphate (Organophosphorus) pesticides then definitely give atropine. But, in the field, you may not have the atropine and you will therefore in all cases, give the activated charcoal orally as soon as possible if the dog is fully conscious. Note, though, that even an unconscious dog can wake up if you put some drops of chicken soup with salt and sugar on its tongue, and then they can drink the life-saving rehydration chicken soup mixed with many capsules of activated charcoal that you've opened and emptied into the soup and shaken for a minute or more. Activated charcoal is not easy to mix with liquid—you really have to shake it. Activated charcoal is non-toxic so do not hesitate to give it to any patient, human or animal, that you even only slightly suspect has had some deliberate poisoning--or accidental food poisoning. Remember, the first sign of food poisoning in a human is not vomiting or diarrhea, it is feeling 'unwell' (often with headache). And that feeling not well is when a person should take a handful of capsules of activated charcoal—at the first sign. As mentioned elsewhere here, the dose for a deliberate or larger poisoning is many, many capsules of activated charcoal, usually 1 gram per kilogram body weight. Each capsule contains about 300mg so that means 3 capsules equals one gram. So for a 100kg person who had swallowed insecticide, poisonous mushrooms or Tylenol (paracetamol;acetaminophen) you would give $100\text{kg} \times 3\text{caps}/\text{kg} = 300$ capsules. For a 20kg dog it would be $20\text{kg} \times 3\text{caps}/\text{kg} = 60$ capsules. But for mild food poisoning you can give a handful of capsules.

Treatment summary

For all dogs:

Ivermectin oral. .

worm meds oral.

Flea/tick medicine applied to shoulders; and/or use permethrin powder.

Iron supplement for anemia (see elsewhere how to diagnose). Many dogs in poor countries are anemic from lack of iron in diet, and from blood loss from mites, ticks, lice and fleas.

Vitamin A supplement absolutely essential for many dogs in poor countries.

Zinc supplement absolutely essential for skin & wound healing as many dogs in poor countries are deficient.

Food

soybean oil (corn oil 'ok' but not as good as soy) for EFAs which are absolutely essential for skin health. A tablespoon or two per day. Add it to dry food or give by itself. They love it.

Wounds, How to treat, summary

Cut hair around wound, **wash** wound if possible (but if dirty you Must get dirt out—flush with very lightly salted water—Not more salty than tears—and **apply iodine** and/or other antibiotic to wound and surrounding area with flea/tick powder to prevent maggot infection or to kill existing maggots) , apply **flea/tick medicine** or powder, give oral **worm medicine**, oral **Ivermectin**, oral **antibiotics**, oral **prednisolone**, oral **antihistamine**. **Feed the dog** protein (dry dog food is often much better than what they normally eat and is much appreciated by dogs) and make sure dog has access to **clean, fresh water** in a clean bowl at all times. Give a spoon or two of **soybean oil**.

Dogs with inflamed skin, and/or hair loss, and/or itching.

Ivermectin, oral

Antibiotic oral (Cephalexin better, Amoxicillin ok) for days or weeks, esp. if skin in bad shape

Flea/tick medicine liquid or powder

Soybean oil oral

Zinc supplement

Vitamin A supplement

worm meds, oral.

Antihistamine (Chlorpheniramine or diphenhydramine ('Benadryl')) if itching greatly

prednisolone oral (steroid anti-inflammatory) for itching but do not give long-term to dogs with Demodex mange). For very severe itching with bleeding skin I will give both prednisolone AND an antihistamine for a few days until they stop tearing open their sores.

Bathe with special shampoo containing one or more of the following: benzoyl peroxide, sulphur, salicylic acid, coal tar. Or just plain soap if you don't have the other things. Bathing is very important if the dog has very little hair, blackened skin, etc. But if the dog has only some hair loss and some redness then you do not always need to bathe. Note: Wait a couple days after bathing to put flea/tick medicine on. If you think that this is the only time you will see this dog then do not bathe, but do everything else.

Feed and give **water** to the dog.

Wounded or sick or mange-ridden dog that won't let you approach it.

Put ivermectin in a little milk and open the antibiotic capsule in the milk, set it down and step back so dog will approach it. If you need to do hands-on treatment then put some **acepromazine with or without some valium (diazepam)** in a sausage and toss it to dog. If you cannot purchase the acepromazine (get a vet to help if necessary) then you can try using Valium (diazepam) by itself, which is often easier to obtain. (see dosages on dosage chart). When dog 'passes out' or is otherwise groggy, then put your **collar/leash** around dog's neck and the other end of the leash with loop around your upper arm so now you have both hands free. If necessary, tie a ribbon or rope around his mouth to prevent biting. Now you can sponge **Amitraz** or Lime Sulphur if he is mangy. And treat wounds with topical iodine and/or antibiotic ointment. When he wakes up then open **antibiotics** capsules, **chlorpheniramine** (antihistamine), **Ivermectin**, etc into bowl of milk or chicken soup and let the dog drink it. You need a copy of Plumb's Veterinary Drug Handbook; if you cannot easily get a copy I can

help you quickly get an electronic one if you send me an email. If you cannot catch him, then put the medicines in milk or chicken soup, set the bowl down, then step back so he will approach it--except **worm pills** should go in sausage or cheese to hide the taste. Cheese is best because it is hard for the dog to spit the pill out.

Mitoban/Amitraz for Demodex mange.

Note: sarcoptes mange—the very itchy kind that causes hair to fall out in clumps, can be cured with two doses of oral Ivermectin, spaced 2 weeks apart, though just one dose can work. But if dog has demodex mange often covering entire body with scaly, blackened skin and hardly any itching then you can be fairly certain it is Demodex mange which can't be cured by two doses of Ivermectin. Either you give Ivermectin EVERYDAY (or every other day) for 8 weeks or longer, OR you dip with Amitraz three to six times (or more) spaced two weeks apart or every week. Amitraz is superior to Ivermectin in curing Demodex.

If you aren't sure if the dog has Sarcoptes or Demodex then give the dosages for Sarcoptes and observe. If dog isn't getting better then try Lime Sulphur or Amitraz dips. If they aren't getting better after a couple of dips in Amitraz then consider oral itraconazole for fungal infections; if you aren't sure of the diagnosis you can also take the dog to a vet for a diagnosis, or email the vet with pics of the dog. All dogs in poor countries need supplemental oral Soybean oil, oral Vitamin A, oral Zinc or else skin will often never heal no matter how many 'regular' medicines you give them. Loss of hair without itching can also be low thyroid. See discussion elsewhere in this manual.

ticks

Very important for both you and dog to avoid removing ticks using only your fingers. If you use your thumb and forefinger you risk squeezing stomach contents of tick into dog which can be VERY bad for the dog because tick-borne diseases are very deadly and very hard to cure and huge numbers of them will be squeezed/vomited into dog if you use your fingers. So, use tweezers if there are only a few ticks. Grab tick at **head area** and pull. Do not use tweezers to grab tick on tick's body area! Only grab at head area. Place removed tick in bowl of water that has a little iodine or bleach added to it.

If dog has dozens of ticks, you can put 1cc of Amitraz in a liter of water and, wearing gloves, **apply Amitraz/water mixture using sponge**. You won't even have to use the entire liter, just enough to soak your sponge and wipe on the dog. The ticks will immediately fall off dead or paralyzed as soon as Amitraz/water solution hits them. But some dogs will not hold still long enough for you to pull ticks off with tweezers or for you to put amitraz on them so instead just pour the 1 or 2 ccs of tick medicine on the shoulder blades and/or dust him with tick powder and give him Ivermectin oral. The tick powder helps greatly in 'knock-down' effect of quick tick killing of the many other ticks that are waiting to crawl on him. I also give Ivermectin PO (by mouth)—see dosages elsewhere. The oral Ivermectin will kill ticks that bite the dog in the next few days and will kill any Sarcoptes mites he may have. Consider giving **oral doxycycline** daily for a month—especially if dog appears ill or walks stiffly or walks little--because the ticks have probably injected dog with deadly stealth organisms. If you can't get close enough to the dog to put any meds on his skin, then just put some Ivermectin in a small bowl of

milk and set it down, back away and let him approach bowl and drink it. That will kill ticks for some days and will start the process of him getting to trust you.

I encourage you to read the following article which covers the 'stealth' organisms transmitted to dogs (and humans) by ticks.

Ehrlichiosis, Anaplasmosis and other Vector Borne Diseases You May Not Be Thinking About

Richard E Goldstein Cornell University Ithaca NY *"The thought of multiple infectious agents causing a combined disease is possibly the most important challenge we face today in infectious disease medicine"*. [http://c.ymcdn.com/sites/www.invma.org/resource/resmgr/imported/Ehrlichiosis Anaplasmosis etc Goldstein 2010.pdf](http://c.ymcdn.com/sites/www.invma.org/resource/resmgr/imported/Ehrlichiosis%20Anaplasmosis%20etc%20Goldstein%202010.pdf)

If the above link has 'expired', then just copy and paste the article title into the search window of google or another search engine.

Reading that article helped me to understand the reason why many of the dogs I see are **lethargic**, have **gait disturbances, stiffness; reluctance to walk; depressed; anorexic; feverish; coughing;** dyspnea (shortness of breath); **loss of stamina; nosebleeds;** little bleeds from other sites; **swollen limbs** or **swollen scrotum** are probably suffering from tick-borne diseases. So I am giving them a 3-4 week course of daily doxycycline. I encourage you to have a high index of suspicion whenever you see a dog exhibiting the signs mentioned here. Of course, you won't be able to take these dogs to the vet for expensive testing, so you will have to use your brain and clinical judgment and just give doxycycline for 3-4 weeks to these dogs. Besides, the Merck Vet manual says explicitly you should not wait for tests to treat if you suspect tick-borne illness. And we should probably suspect tick-borne illness in any and all dogs in places where you see many ticks on dogs. Remember, it only takes ONE tick to cause illness. And the dogs in poor countries often have 20-30 on them at one time, which fall off after engorging, only to be replaced by 20 more ticks. So giving a month of daily doxycycline is a no-brainer in this situation. Always follow Doxycycline pills or tablets with a squirt in the mouth of water or milk, because doxycycline can severely burn the esophagus if it gets stuck there (which it won't if you follow it with a piece of sausage or a few sips of milk from a bowl).

*"The **drug of choice** for infection with Ehrlichia and Anaplasma species (**from ticks**) is **doxycycline** because of its superior intracellular penetration and bacteriostatic properties against rickettsiae. Doxycycline is recommended for dogs of all ages. If infection is suspected, dogs should be treated empirically—('empirically means: give it to them without knowing for certain if they have infection)-- **treatment should not be withheld or delayed** pending laboratory results... The recommended dosage of doxycycline in dogs is 5–10 mg/kg/day, PO or IV, for 10–21 days". (Merck Vet Manual)*

I have read others who feel giving the doxycycline for 28 days is preferable to 3 weeks, so this is what I do. I also will give metronidazole every other day to kill the cyst form of Lyme disease, for example. This protocol—doxycycline plus metronidazole—is also used in humans who have been bitten by ticks.

Many if not most of the dogs you see will have ticks—often dozens, which means before those dozen started eating there were dozens more just before it, and dozens more before those, and so on. Since doxycycline is not a dangerous medicine, it is an easy decision to give it whenever you suspect a dog
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has had a heavy tick burden, and especially if they are anorexic (don't want to eat, or eat much), depressed, apathetic, walk stiffly, or stumble when walking, have nosebleeds, etc. In Thailand, doxycycline can be as cheap as one U.S. cent per 100 milligrams. So a one month daily dosing will cost 30 cents up to a dollar or so.

Dosages for Dogs/Cats. (print this dosage chart out and carry with you). It is essential that anyone giving meds to animals get a copy of the great book, "Plumb's Veterinary Drug Handbook (pocket edition)". It is not really pocket size but that is what they call it; it is certainly smaller than the larger desk version, which I don't recommend, as it is like many medical texts: big, heavy and unwieldy. It is very important to get a copy Plumb's because there is essential info in there on how to give drugs, which drugs for which problem, & which drugs you should not use together, etc. If you cannot easily locate an inexpensive copy, then email me and I will help you get an electronic copy for 'next to nothing'.

Note on abbreviations: **Q** means "every". **PO** means "Per Os" (by mouth) **SID**=once every day; **BID**=twice/day; **TID**=three times per day; **QID**=four times per day; **SC**=subcutaneous (SC: under skin. Lift up skin over shoulder and inject there after wiping skin with alcohol or iodine).

acepromazine 0.5-3 mg/kg TID, QID but you only need to give higher dose ONE time (SID) to immobilize.

Acetaminophen ('tylenol', 'paracetamol') dogs: 15mg/kg q8h but do NOT give to CATS

Amitraz 12.5%, 10.6ml per 2 gallons of water for demodex mange, 1x Q 2 wks but every week better, for 8-10 wks, Clip hair if long.

Wear rubber gloves. Pour on dog, do not rinse off. in plastic cup soak feet a minute each. let air/sun dry. wash your hands/arms. do not reuse remaining contents or bottle. See elsewhere this manual & Plumb's for detailed info. Some ataxia and uncoordination is common for hours after amitraz application so don't worry..

Amoxicillin 10-20 mg/kg PO, bid (dogs), sid-bid (cats)

Aspirin dogs 10-25 mg/kg PO BID-TID; cats -10 mg/kg PO Q2d (better to use Carprofen)

Atropine. dogs/cats 0.2-2mg/kg, given 1/4dose IV, 3/4 dose SC. But if you can't find vein for IV then just give it SC.

Benzodiazepines for seizures, anxiety. Effects may be potentiated by Ivermectin. 'Benzos' include: Valium (see), Xanax, Ativan.

Carprofen (Rimadyl) for pain/inflammation: dogs 4.4 mg/kg per day PO, or divided 2.2mg/kg BID.

Ceftriaxone injectable broad-spectrum antibiotic. 20-50mg/kg SQ, IM, IV. The Thai package says give IM or IV.

But that is very painful and Plumb's Vet Drug Handbook shows you that SC/SQ works just as well. Directions tell you how to reconstitute the powder using only the sterile water that comes in box, but you can also mix it 50%sterile water & 50% lidocaine to avoid any pain.

Cephalexin 20-60 mg/kg PO, 2-3x/day bid-tid

Charcoal 1-4g/kg po Q 6-8 hr (for poisoning)

Chlorpheniramine (antihistamine) for itching/allergic reactions: dogs 2-8 mg PO BID or TID and 1-2 mg Cats. And if you do have not atropine, you can use chlorpheniramine in a dog **poisoned** with a carbamate or organophosphate pesticide because it is anticholinergic and there are studies of it being helpful if atropine is not available. For poisoned dog: 10mg/kg IM, but you may not have injectable, so give a higher dose orally (or rectally if dog is unconscious).

Clindamycin for **dental** & skin infections. 10-30mg/kg q12h for up to 28 days but stop if no response after 3-4 days.

Dexamethasone: for shock: all species: 5mg/kg IV bolus, CNS trauma-2-3 mg/kg IV, then taper to 1 mg/kg SQ TID-QID; for anti-inflammatory, give dexamethasone 0.07-0.2 mg/kg PO, IM, SQ SID. If you have no needle then give orally or crush to powder and give rectally with a little water.

Diazepam (**valium**): all species-0.25-0.5 mg/kg IV, IM, IP, oral. For seizures use higher dose.

Diphenhydramine ('Benadryl') dogs: 2-4 mg/kg. 'Benadryl' is antihistamine, anti-itching, antiemetic (stop vomiting), and a sedative/sleep aid. Chlorpheniramine (see) is more widely available & cheaper in some countries

Doxycycline 5-10mg/kg PO SID ***"If doxycycline capsules are administered, it is critical to have the animal drink afterwards to ensure passage into the stomach. If capsules remain in the esophagus, severe local necrosis with subsequent esophageal stricture can occur"***. (Merck Vet Manual)

Flea/tick powder. Powders containin pyrethrins or pyrethroids/permethrin are excellent for dogs but do not use on cats.

Griseofulvin for 'ringworm' fungus (dermatophytosis) in dogs, usually not recommended for cats. Microsized formulation of griseofulvin can be used in dogs 50 mg/kg, daily or in divided doses and is best absorbed given with a fatty meal (cooking oil, margarine, butter).

Ultramicrosized 10-20 mg/kg PO once daily.

Hydrogen Peroxide to make vomit: 2 ml/kg every 15 minutes but give no more than 45ml total

Hydrogen Peroxide to disenfect wound: pour liberally along with Iodine (betadine)

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Ibuprofen can be toxic to dogs and cats. Use carprofen ('Rimadyl') instead. Or use dexamethasone or prednisolone if no Rimadyl available.

Iodine (betadine) pour liberally on/in wound along with hydrogen peroxide

Itraconazole for fungal infections: 5–10 mg/kg/day. Cats: 10 mg/kg/day

Ivermectin 0.2-0.6 mg/kg. Note: on a 1cc syringe, each 0.1 cc has 1 mg (1000mcg).

Ketoconazole for Malassezia ('greasy, yeasty, smelly' skin fungal infection). Read Plumb's Veterinary Drug Handbook for more info.

Loratidaine (clarityne) (an antihistamine) no known toxicity.

Metronidazole for diarrhea & to kill cyst form of tick pathogens. 10-20 mg/kg PO BID TID plus give acidophilus/probiotic. Adverse effects in dogs so use Metronidazole under supervision of vet.

Poisoned with Warfarin (rat poison): oral activated charcoal if recently ate, then give **Vitamin K1** 0.25-2.5mg/kg or 2.5-5mg/kg, PO and/or SC. Inject under shoulder skin with smallest needle in several locations to minimize bleeding. Do not give IV. Or just give oral if you have no needles & syringes.

Poisoned with Carbamate or organophosphate insecticide (most common kinds) give oral activated charcoal if dog is conscious and can swallow. Antidote is injection of **atropine** dogs/cats 0.2-2mg/kg, given 1/4dose IV, 3/4 dose SC or give full dose SC if you cannot find vein. Start with smaller dose until pinpoint pupils get wider. Other signs of this poison in dogs and people is diarrhea, urination, muscle weakness, lung secretions, slow heart, vomiting, tears, salivation

Prednisolone .5-2 mg/kg PO, SID or every other day (for shock use an even higher dose, 5-10mg/kg)

pseudoephedrine 0.2-0.4 mg/kg

Toad poisoning. Give Activated Charcoal And Atropine. Give Lidocaine for tachyarrhythmia. Valium (or other benzodiazepine such as zanax if no valium available) for CNS excitability

Tramadol for pain. Dogs: 5-10 mg/kg PO, Q4-6 hrs. Cats: 1-4 mg/kg, PO, Q4-6 hrs.

Valium 0.5-3 mg/kg for seizures or anxiety. If having a seizure you can give it rectally if necessary: crush tablet mix with a LITTLE water, squirt into rectum using syringe with no needle.

Worm meds often include praziquantel, febantel and pyrantel. Follow directions. But use double-dose for diarrhea instead of using metronidazole..

Xylazine Sedative/analgesic; has emetic effects in cats. 0.05-1 mg/kg dogs. 0.1–1mg/kg cats. IV, SC, IM (yohimbine reverses xylazine; that is, yohimbine is 'antidote' to reverse effects of xylazine).

Give midazolam (alprazolam) with acepromazine and especially with ketamine because alprazolam lessens chance of seizures caused by ketamine and/or acepromazine.

Gums above upper canines should be **pink**.

Pressing on pink gums they should turn white, then release pressure and they should return to pink within 2 seconds. If they don't return to pink within 2 seconds then there is probably a problem with circulation.

Observing the dog's gums (without pressing on them) the gums could be the following colors:

Blue: lacks oxygen

White or pale: could indicate anemia.

Purple or gray with slow capillary refill: shock

Bright red: systemic infection or toxin

red, inflamed gums can be a sign of gingivitis, a serious dental infection that can kill the dog. **Bad**

breath is a sign of serious mouth infection. See section 'Pain, Dental Infections' this manual.

Yellow can mean dog has Leptospirosis. Doxycycline: 5mg/kg per day for 2 weeks.

"Some dogs have black-pigmented gums, which can make assessment difficult. For these dogs, you need to examine the pink tissue on the inside of the lower eyelid by gently pulling the eyelid down. In this case, you can only observe the color of the tissue — you can't perform the capillary refill test — but

colors mean the same thing in gums and inner eyelids” (What Your Dog’s Gum Color Tells You by M. Christine Zink)

Treatment of carbamate insecticide poisoning is similar to treatment for organophosphate insecticide poisonings (basically, give oral activated charcoal, atropine IV and/or SC, fluids IV and/or oral; give fluids rectally if unconscious and you have no IV). Note that these insecticides (“nerve agents”) are the same type of poison used in many chemical warfare agents such as VX & Sarin. When these poisons are dropped or smeared on people (or people spill them on themselves) note that if the doctors run low on atropine you can often find **the antidote, atropine**, at a veterinarian or even at a pharmacy as eye drops, which eye drops you can apply to the eyes and the atropine will indeed get into the systemic circulation perhaps saving the patient. Often the people rushing to aid the victims with skin exposure do not know to immediately **remove the clothing** of the victims and then immediately **bathe the affected people** with soap and water—or even just water, if no soap available. Immediately removing the clothing and bathing the body removes the pesticides from their skin and can help save victims. Bathing a dog doesn’t help, however, because most poisonings of dogs are oral poisonings—people hide the pesticide in some meat and the dog eats the meat—and so bathing won’t help. What will help a patient who has ingested most poisons is to give them **1g/kg activated charcoal** orally in a drink (shake for a minute or more) as their first dose. Repeat with 0.5g/kg every 4-6 hours for 3 additional treatments (**Multiple Dose Activated Charcoal—MDAC**). Mix with strong chicken soup to get the dog to drink it.

Some common names of carbamate insecticides: Carzol, mexacarbate (Zectran), aldicarb (Temik), carbofuran (Furadan). methomyl (Lannate), carbaryl (Sevin).

Some common names of organophosphate pesticides: Azodrin, Bidrin, Bomyl, carbophenothion (Trithion), Co-Ral, Dasanit, DDVP (Vapona), demeton (Systox), Diazinon, dimethoate, dioxathion (Delnav), disulfoton (Di-Syston), Dursban, Dyfonate. EPN, ethion, famphur (Warbex), fenthion (Baytex), Guthion, malathion, Metasystox-R, methyl parathion, Monitor, parathion, phorate (Thimet), mevinphos (Phosdrin), phosphamidon, Schradan (OMPA). Supracide. TEPP)

atropine sulfate injections readily reverses the effects of organophosphate or carbamate insecticide poisonings in humans and dogs. Recommended dosages for atropine are as follows: dogs and cats—dosed to effect (**repeated as needed**), usually 0.2-2 mg/kg, parenterally (other than by stomach), one-fourth of the dose given IV and the remainder given SC (cats should be dosed at the lower end of the range). But if you are like me and untrained to quickly find a vein, then just go ahead and give 3/4ths dose SC—subcutaneously. **Grab the skin of the shoulder blades, lift the skin up, inject there under the skin.** Then, if you can locate a vein, give the other 1/4th dose IV. If you cannot find a vein, then give the remainder SC as well. It is a good idea to learn how to find a vein on a dog. Ask your vet to teach you and/or look on youtube.

For Warfarin (rat poison) etc: Vit K1 **Vitamin K1** is antidotal. Recommended dosages vary from 0.25-2.5 mg/kg in warfarin (coumarin) exposure, to 2.5-5 mg/kg in the case of long-acting rodenticide intoxication (diphacinone, brodifacoum, bromadiolone). Vitamin K1 is administered SC (with the

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smallest possible needle to minimize hemorrhage) in several locations to speed absorption. IV administration of vitamin K1 is contraindicated, as anaphylaxis may occasionally result. The oral form of K1 may be used daily after the first day, commonly at the same level as the loading dose (divided BID, twice per day). Fresh or frozen plasma (9 mL/kg) or whole blood (20 mL/kg) IV is required to replace needed clotting factors and RBCs (red blood cells) if bleeding is severe. One week of vitamin K1 treatment is usually sufficient for first-generation anticoagulants. For intermediate and second-generation anticoagulants or if anticoagulant type is unknown, treatment should continue for 2-4 weeks to control long-term effects. Administration of oral vitamin K1 with a fat-containing ration, such as canned dog food, vegetable oil, butter increases its bioavailability 4-5 times as compared with vitamin K1 given PO (oral) alone.

Clinical signs of **warfarin (rat poison)** generally reflect some manifestation of hemorrhage, including anemia, hematomas (lumps—of blood underskin), melena (dark bloody poop), hemothorax (blood in throat), hyphema (blood in eye) epistaxis (nosebleed), hemoptysis (coughing up blood), and hematuria (blood in urine). Signs dependent on hemorrhage, such as weakness, ataxia, colic, and polypnea (fast breathing) may be seen. **Depression and anorexia (not eat) occur in all species even before bleeding occurs.**

Antifreeze poisoning (ethylene glycol). **This poisoning is common in dogs and cats in because often a pool of antifreeze in the driveway is the only liquid available and they drink it**, especially since it tastes sweet to them. Sometimes animals are deliberately poisoned with it. From Merck Vet Manual: *“The onset of clinical signs is almost immediate and resembles alcohol (ethanol) intoxication. Dogs and cats exhibit vomiting due to GI irritation, polydipsia (drink a lot) and polyuria (urinate a lot), and neurologic signs are : CNS depression, stupor, ataxia (incoordination), knuckling (drags top of paw on ground when moving), decreased withdrawal and righting reflexes. Oliguric (too little urination) acute renal (kidney) failure usually develops between 12 and 24 hr in cats and between 36 and 72 hr in dogs. Signs include lethargy, anorexia, dehydration, vomiting, diarrhea, oral ulcers, salivation, tachypnea (rapid breathing), and possibly seizures or coma. The kidneys are often swollen and painful on abdominal palpation. **Treatment: If within 1-2 hours of ingestion, induce vomiting. In all cases, give drinking alcohol (vodka, whiskey) per instructions below.***

One antidote to antifreeze (ethylene glycol) poisoning is ethanol (drinking alcohol, such as vodka or whiskey). Antifreeze is toxic to humans and animals only because the liver metabolizes it into toxic metabolites. Fomepizole is an antidote that some vets may use, but many vets won't bother stocking it as it is expensive (\$3,000 per treatment) and is not recommended in cats. They will use instead **ethanol (drinking alcohol)** because the ethanol will prevent the antifreeze from breaking down into the toxic metabolites (just as the fomepizole does, but at a tiny fraction of the cost). Ethanol regimen (from Merck Vet Manual): *“5.5 mL/kg of 20% (40proof) diluted in IV fluids and given as a drip over 6 hr for five treatments, and then over 8 hr for four more treatments.”* **The 40 proof (20%) the doctors have is NOT probably what you will have. You will likely have what is found in every liquor store: 80 proof (40% alcohol)** in which case you'll need to divide the above 40 proof (20%) dosages by two since 80 proof is twice as strong as 40 proof (see math below). And since you won't have an IV and sterile equipment you will be giving the patient the alcohol antidote Orally (**or rectally**, if you cannot squirt it

in the back of their mouth or the patient is unconscious or breathing is impaired. Adding a little chicken soup to it may help, but the first dose you need to not waste time making chicken soup. **Your goal is to keep the dog or cat 'drunk' (inebriated) for 2-3 days using the amounts and number of treatments listed here if you think they have been poisoned with ethylene glycol. Also, give them electrolyte fluids orally, rectally (or with an IV if you have all the sterile equipment necessary).** See discussion elsewhere on how to using Oral Rehydration Solution (ORS)—salt, sugar and water (homemade Gatoradie, 'electrolytes'). Also, give them baking soda one time per instruction below.

So below is the math for the kind of vodka or whiskey you will likely have (80 proof). But first here are some unit measurements that are good to know:

1 mL = 1 cc.

2.5 mL = 2.5 cc = 1/2 teaspoon (tsp).

5 mL = 5 cc = 1 tsp (TEAspoon).

15 mL = 15 cc = 3 tsp = 1 tablespoon (tbl or Tbsp).

30 mL = 30 cc = 2 Tbsp = 1 fluid ounce

Get them Drunk to Save them

So let's do the math for giving **80 proof (40%) alcohol (vodka/whiskey, etc)** to an animal that has ingested some antifreeze: **If 80 proof (40% alcohol) then use 2.75 ml, per kilogram body weight every 4 hours for five treatments, then every 6 hours for 4 additional treatments.** Your goal is to keep the animal mildly 'drunk'—inebriated—for 2 to 3 days.

2kg cat/dog x 2.75 ml/kg = approx. 5ml which is approx. **1 TEAspoon** (tsp) 80 proof drinking alcohol

5kg cat/dog x 2.75 ml/kg = 13.75ml or just under **1 TABLEspoon** (TBS) about half an ounce vodka, whisky, etc

10 kilogram dog x 2.75 ml/kg = 27.5 ml which is about **2 TABLEspoons**—1 ounce 80 proof vodka, whiskey, etc

20 kilogram dog x 2.75 ml/kg = 55 ml or about two ounces **4 TABLEspoons**. 2 ounces 80 proof vodka, whiskey, etc

30 kilogram dog is 10kg + 20kg: 2 TBS + 4 TBS equals **6 tablespoons**. 3 ounces 80 proof vodka, whiskey, etc

If, however, in the unlikely event the alcohol you are using is 40 proof (20%), then double the above dosages.

Note that you only have to remember the following so you do not have to remember all the numbers above: One TEAspoon vodka, etc for each 2 kilograms (4.4 lbs) that each dog or cat weighs. Or, using approximate doses, one TEAspoon for every 4 or 5 pounds (lbs) the animal weighs.

Do not give the entire dose at one time. Instead, **give each dose spread out over the first hour of each time period.** You therefore want to 'drip-drip-drip' the dose into the animal over the first hour of

each 4-hour period and then the first hour of each 6-hour period. This is called a Constant Rate Infusion (CRI) over one hour.

Also give thiamine (Vitamin B1) or a multi-vitamin that has thiamine in it, because thiamine is severely depleted by ethylene glycol poisoning and, without thiamine supplementation, the patient may not survive. Thiamine supplementation is also absolutely essential for humans who have a ‘problem’ with drinking too much alcohol and thiamine is among those things immediately put in via IV to alcoholics who end up in the hospital emergency room. And they are also given ORS (salt/sugar rehydration mixture) along with **extra sugar** to correct their low blood sugar.

You will also need to give—one time only--some **sodium bicarbonate (baking soda)** for the metabolic acidosis that results from the antifreeze ingestion. A vet or M.D. will have the sodium bicarb already premeasured in ampules (‘amps’) but you won’t have those so you need to know the correct amount to give orally from your box of powdered baking soda. See those amounts below for quick reference. Bear with me while I list all the math and units here so that others—including vets—can check my math and calculations. I could not find info on using baking soda out of the box to treat metabolic acidosis, so I did these calculations myself. I am posting the math here so others can check it—and correct it if necessary.

You can skip all those calculations and just find the amount of baking soda next to the kilogram weight of the animal you’re treating. Remember that the alcohol you give the animal as the antidote will also help correct the metabolic **acidosis and it is the alcohol antidote that is the most important thing for you to focus on** if your animal has ingested some antifreeze.

The oral dose for sodium bicarbonate (baking soda) to correct metabolic acidosis is 2-5 mEq/kg. mEq stands for ‘milli-equivalent’, and is a measure of the number of active particles in a substance. I will use the lower end of the dose range—2mEq/kg—in order to avoid possible overdose and to give you room for error.

One gram of baking soda provides 11.9 mEq each of sodium and bicarbonate. I will round 11.9 mEq up to “12 mEq” to simplify the math.

One teaspoon of baking soda weighs 4.7 grams.

2kg dog/cat: ‘half of half’ of a ¼ tsp (which is 1/16 tsp) baking soda (which is ‘half of half’ of a quarter teaspoon. Here’s the math: 2 kg cat/dog x 2mEq/kg=4mEq. 4mEq divide by 12mEq/gram = 1/3 gram. And because a Tsp of baking soda weighs 4.7 grams then ¼ Teaspoon weighs 1.175 grams but we want 1/3 gram (which is 0.333 grams). 1.175 grams (1/4 tsp) divide by 4 = 0.294 grams or close enough to 0.333 grams. Therefore, **for a 2kg dog/cat, use a ¼ tsp and “fill” it only approximately one-quarter full of baking soda or a bit more.** That is, use only “half of half” of a quarter tsp—1/16th tsp--for a 2kg dog/cat.

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4kg dog/cat: half of a quarter TEAspoon (or 1/8 tsp) baking soda. 4kg dog/cat is 2 times that of a 2kg dog/cat above. So use a half of a quarter' TEAspoon (1/8 tsp) of baking soda.

8 Kg dog/cat: 1/4 TEAspoon (Tsp) baking soda. 8kg dog/cat is twice that of a 4kg so use a quarter TEAspoon (1/4 Tsp)

16kg dog: 1/2 TEAspoon (tsp) baking soda. 16kg is twice as heavy as the 8kg animal above.

20kg dog: a little MORE than **½ Tsp** baking soda. 20kg = 4kg + 16kg so use 4kg & 20kg numbers above: $1/8 + 1/2 = 1/8 + 4/8 = 5/8$ or a little more than ½ teaspoon

24 kg dog: 3/4th TEAspoon (tsp) baking soda ($1/2\text{tsp} + 1/4\text{tsp} = 3/4\text{tsp}$). 24 kg = 4kg + 20kg (so use numbers above): $1/8\text{tsp} + 5/8 = 6/8 = 3/4\text{tsp}$ (which is also $1/2\text{tsp} + 1/4\text{tsp}$)

And so on. If your animal weighs more or less than the above numbers you can use the closest number. Remember, that I did the above calculations using the lower amount, so if you use a bit more it's no big deal. If your animal weighs more than 24 kg, then figure out the amount the way I did above: adding the two numbers that give you a weight close to yours.

Give the baking soda to your animal only one time, orally (or rectally if unconscious). Focus instead on giving the correct amounts of 80 proof (40%) vodka/whiskey/etc for the correct number of times.

Flies, Maggots and Lice

You can kill maggots easily with oral Ivermectin and with topical flea/tick powder containing pyrethrins/permethrins and also sedate a dog (if necessary) so you can pick the maggots out with tweezers, if you don't want to take it to a vet. Fortunately, you won't have to deal with this problem often—or never. But understanding it will enable you to deal with it if you have to and it will help you prevent maggot infection in the first place.

It is true you can just give oral Ivermectin and sprinkle pyrethrin or permethrin flea/tick powder into an open maggot-infested wound—and on the rest of his body--and let it go at that. But it is much better to take the time to remove the maggots because dead and decaying maggots left in a wound aren't good for the dog. But, you may only have a brief encounter with a dog and you may not be able to remove the maggots if you can't catch him. So make sure you: 1) first give him oral Ivermectin and oral antibiotics. And if you can, sprinkle the pyrethrin/permethrin powder into and around the wound before the dog runs off.

One golden retriever I cared for had a 3 centimeter diameter hole in his skin where maggots had taken up residence—you couldn't readily see the maggots but you could see the dog frantically scratching at the hole and a reddish-clear liquid. This golden was so calm he didn't need to be sedated and he was probably very smart and realized I was there to help him. So he lay still the entire hour it took me to get the maggots out. I had to lay on the floor and put my penlight in my mouth so I could use both hands: one hand to pull the wound open and the other hand with tweezers to extract the maggots and

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put them in a bowl of water with a little bleach. A **flashlight** with strap—a **headlamp**—is a useful thing to have in your pack, so you can see better into wounds, and also because you may be out after dark and need to better see the dogs you are helping.

Flies buzzing around a dog is a “Red Alert”. Whenever you see flies buzzing about a dog you will probably either find an open wound or feces/urine matted into the dog’s coat. If feces and/or urine it is extremely important to clean that and cut the hair if necessary to get rid of the smell that is attracting the flies. If left untreated the feces/urine will attract flies who will lay eggs creating maggots that will eat the dog.

If you see flies around a dog

then you need to suspect an “invasion of the body by the larvae of flies” which is the definition of the medical word “myiasis”. Having maggots (fly larvae) is a very serious problem and if you see flies constantly on or near a dog you need to take action. Dogs fight each other and dogs bite each other, often causing open wounds—maybe just a small wound but enough to draw blood. And the smell of blood is like a dinner bell for flies. But a clue will be where the flies are landing on the dog. You may not see the wound if it is buried under hair. Bacteria and flies like open wounds. Flies like to lay their eggs in and around the wounds—when you see flies around a dog the flies aren’t there to ‘find food’ for themselves, they are there to lay dozens or hundreds of eggs very quickly, which turn into maggots which then go to work eating the dog by burrowing their way into flesh. If the dog has been sick with diarrhea and has feces and/or urine in its hair then you need to give the dog a bath and cut its hair if it is long and especially long and tangled and knotted. Flies, ticks and fleas love a ‘protected environment’ like tangled, knotted hair especially hair that is dirty with feces or urine or blood. And, surely, these twisted knotted balls of hair can’t be comfortable for the dog.

The tiniest of pinprick wound that has just a drop of blood can attract flies who lay their eggs which, when they become maggots, will begin to eat their way into the body, expanding the pinprick wound into what can become a very large, often circular, wound that oozes body fluids and has a very pronounced sickly odor. This is why it is so important to go to “**Code Red**” when you see flies constantly around or on an animal, or when you detect a very offensive smell and then find an open wound. Using fingertips you can ‘search’ for hidden wounds under hair.

If you see dirt and debris in the wound then it is extremely important to clean the wound of the dirt and debris. The medical term for this cleaning of a wound is ‘debridement’. If you leave dirt and debris in a wound then it may not matter how much antibiotics you give—the animal may never recover because the remaining dirt and debris may continue supplying bacteria to the dog. So clean the wound.

If all you have is a water in a bottle then use that to slowly pour water on the wound while you wipe and ‘sweep’ the dirt from the wound. Then, irrigate wound with iodine and some drops of hydrogen peroxide—“brown and bubbly”. Iodine (betadine) by itself is also excellent. **Also, give oral Ivermectin** as it will help kill the maggots, too. Give oral antibiotics, too.

If the wounds on the dog has maggots in them for a long time, you will know it, believe me. It is the worst, most foul, smell I have ever smelled: decaying, rotting flesh. I saw one dog with very large wounds like this---10-20 or more centimeters in diameter.

“the hair coat should be kept clean of urine or feces (in the hair) and should not be permitted to become matted. Contaminated wounds and matted hair coats soaked in urine or feces rapidly attract adult myiasis-producing flies. Removing maggots from existing deep tissue pockets may be difficult, and sedating or even anesthetizing the animal may be necessary. The lesion should be examined on successive days; adult flies lay eggs in the wound at different times, and hatching of larvae may not be synchronous.” (Merck Veterinary Manual)

(Note: you will not always be able to sedate a dog to clear maggots. So just give a dose of Ivermectin in milk or soup or directly squirted in mouth; and of course give a course of antibiotics to help with infections from the maggots that are dying from the Ivermectin) and sprinkle some permethrin powder all over the animal especially around the wound. Repeat the powder application and the oral Ivermectin in a few days.

Maggots (Myiasis): Treatment Summary:

Essential:

Ivermectin Oral 0.3-0.5 mg/kg which will help kill maggots.

Flea/tick powder, preferably ones with permethrin as main ingredient.

Wash any urine or feces that may be stuck in hair, attracting flies. Cut hair if necessary.

Iodine drops in wound.

Antibiotics Oral (amoxicillin, Cephalexin, etc)

Antihistamine Oral (**chlorpheniramine** or **diphenhydramine ('Benadryl')** to help itching so dog won't scratch wound making it worse

Prednisolone Oral to help itching so dog won't scratch wound making it worse

Remove the maggots with tweezers, placing them in a bowl of water mixed with some drops of iodine.

Removing Maggots

Some dogs won't let me touch them so cleaning the wound may be difficult unless you have a way to make the dog 'sleep' (**acepromazine, or 'Ace'**). So I will put some food down near me, the dog will come close to eat it, and I will already have my arm extended with hand containing **flea/tick powder—preferably with permethrin as main ingredient--**which I then shake near the wound while dog is eating. I then dribble liquid Iodine onto the wound while the dog is distracted by eating. You should squirt some Ivermectin in the dog's mouth or food as that will kill maggots for several days as they feed. Repeat the oral Ivermectin 3 or 4 days later. Continue oral antibiotics for a week or so. Give an antihistamine such as chlorpheniramine or diphenhydramine ('Benadryl') or loratadine daily if the dog is scratching the wound(s). Give prednisolone or dexamethasone, too, if scratching is intense.

If the dog will let you—or if you can sedate him with acepromazine or whatever—then you need to use your tweezers to remove the maggots. The wound may have an 'edge' to it that when lifted reveals a

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kind of ‘cave’ under the skin where you see the body fluids oozing. Soak up these fluids with something clean—tissue paper works okay—but a clean cloth would be better. Holding your little flashlight in your teeth—or using your headlamp—lift up the edge of the wound after you’ve soaked up the fluids and you will see what appears to be white rice. You will probably have to lay down to do this so your head can be ‘even’ with the hole you are lifting ‘up’ or ‘opening’. Get comfortable because you will be there a long time, as picking a 100 squirming maggots is not a quick deal. Using your tweezers grab one of the maggots and pull it out—you may find that there are two or more in your tweezers—and put the squirming maggots in a bowl of a little bleach mixed with water—or just iodine if you don’t have the bleach and water. Then repeat this process over and over until you have removed as many maggots as you can see. Keep blotting up the oozing body fluids as you work because this will help you see the maggots inside the wound.

When you are visiting your dog friends I find it a good idea to touch the entire body of the long hair dogs, looking for wounds by spreading the hair with your fingers while you look as well as touch the skin. I have been often surprised what I find underneath long hair on a dog that looks happy and strong with his or her tail wagging. I often find bite wounds that are not healing, pus, blood, ticks, lice, etc. This wound may not have the unmistakable horrible smell of a maggot-infested wound, but it may have fly eggs already laid. And even if there are no maggots there now, you can be sure some flies will be attracted to it very soon. So make sure you dust it with flea/tick powder in addition to the other things described here. You may not see the dog the next day but the flea/tick powder you dust on and around it will kill any maggots laid the next day. If there is urine or feces in the hair, this absolutely must be bathed out with soap and water. But even in the worse case scenario of a dog you cannot control long enough to bathe it (or cut its dirty hair) then make sure you give all meds already mentioned especially sprinkling flea/tick powder.

The vet pointed out that these large wounds could have begun as a small pinprick-size area of blood on the dog’s skin, where flies start laying eggs, and, as they hatch, the maggots eat and eat so that the wound enlarges. So if you see a tiny wound it is a good idea to powder it with flea/tick powder and then apply iodine and/or other antibiotic cream.

Note that there is one fly in North America, the Gray Flesh Fly, that does not need a wound in order to invade the body. It can deposit larvae (instead of eggs) on healthy, uninjured skin of suitable hosts (including young children), particularly young animals. “Larvae penetrate the unbroken skin and form a boil-like swelling, producing intense irritation and inflammation.” (from the Merck Veterinary Manual)

Wounds and Triage

Dogs can get large open wounds from fighting or from having been cut with machetes by drunk locals. If wound is over a couple days old the vet will not be able to sew it up. Ideally, you might want to have the wound sewn up by a vet if it is a fresh wound (‘old’ wounds harder to sew up)-- but the fact is even a large wound as 20 cm—8 inches—can heal without stitching if you put iodine liquid, hydrogen peroxide and an antibiotic—say, Bacticin--cream on it daily and giving oral antibiotics. Sure, taking the

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dog to the vet is perhaps preferable but if you are caring for many, many dogs you have to make a ‘battlefield’ decision—based on ‘triage’ principles as well as your budget. **Triage** is the doctor term for dividing patients into three groups **1)** those that will live even if no immediate treatment is given now, that is, they can be treated later **2)** those that cannot be saved with available treatment—so no treatment is given and the patients are left to die and **3)** those that can be saved by giving prompt treatment.

Lice run fast, hard to see

One dog I treated had been hit by a car and its hind legs were paralyzed so it couldn’t defecate properly. The result was feces and urine in its hair, which attracted flies and their maggots. I cut the hair and bathed the crippled dog. This dog also had **lice**. At first I didn’t see them because when you part the hair of the dog the lice run very, very fast, almost disappearing before your eyes. Very tricky little blood suckers! So I made sure to dust the dog with flea/tick powder and dust its bed area when I visited him. You can give him oral Ivermectin because that, too, will help kill the lice when they bite the dog. Oral Ivermectin can also help with lice on humans. It has been shown to be superior to topical malathion in treating head lice in humans.

Ivermectin for Heartworm--How to save hundreds or thousands of dollars on your dogs

Using ‘bulk’ Ivermectin to prevent heartworm

Heartworms are transmitted by mosquitos and can grow up to many inches long while they live in the heart of a dog. The monthly heartworm preventative, Heartgard, sold by vets for anywhere from \$5-\$8 per month, can be done by you for pennies if you use a drop or two of Ivermectin from your bottle. The money you and friends save doing it this way you can instead donate to a dog rescue group in a less developed country where \$5 can end the suffering of many dogs with Sarcoptes mange. Encourage your friends how to use a ‘cheap’ bottle of Ivermectin to save, cumulatively, thousands of dollars. Donate that saved money to rescue organizations. *“Clinical signs of heartworm infection, such as coughing, exercise intolerance, unthriftiness, dyspnea (difficulty breathing), cyanosis (bluish gums from low oxygen), hemoptysis (coughing up blood), syncope (fainting), epistaxis (nosebleed), and ascites (fluid swelling in midsection) may develop”.* (Merck Vet Manual)

Read the label of your Heartgard box and note that Ivermectin is the active ingredient in the monthly heartworm prevention pills that people give their dogs. The wonderful medicine Ivermectin in tiny amounts will kill the circulating microfilaria (‘baby’ heartworms) and prevent them from taking up residence in the heart. The amount of ivermectin for monthly heartworm protection is hundreds of times smaller than you will be giving for killing mites and worms and only costs a couple of cents but people don’t know this so they fork over a thousand dollars or more for Heartgard over the lifetime of the dog when they could have done it themselves for a few dollars using drops from their Ivermectin bottle.

One Drop of Ivermectin orally per month to dogs for prevention of Heartworm—cost 3 cents per dog per month to prevent heartworm and kill circulating microfilariae (‘baby’ heartworms). Note that 2 or 3 drops is fine, also, and won’t hurt the dog, but don’t give more than a drop to sensitive breeds.

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If you need to convince yourself that the “1 drop” is the correct amount here is the math. Ivermectin comes in bottles that say “1% solution” which means there is 1 gram (1000 mg) in a 100 ml bottle because the liquid (water) in the Ivermectin bottle weighs 1 gm per 1 ml/cc. Note that 100 cc is the same thing as 100 ml. 1000mg divided by 100ml equals 10mg Ivermectin per cc/ml if a 1% solution. So that works out to 1 mg Ivermectin per 0.1cc (1 mg per each tenth of a cc/ml). Each dog needs 6 mcg--(micrograms: millionths of a gram)--per kg body weight per month, so a 20 kg dog (44 lbs) needs 120 mcg per month (20 kg x 6 mcg/kg) to prevent adult heartworms. As you can see this 120 mcg (microgram) for a 20kg dog is a very tiny amount! **120 millionths of a gram will kill millions of circulating microfilaria!**

There are 2 drops per 0.1 cc and since that 0.1 cc has 1000 mcg in it that means one drop has 500 mcg of Ivermectin. Since a 20 kg dog only needs 120 mcg that means one drop is more than enough given orally each month to prevent heartworm for any dog up to 80 kg. Giving 500 mcg when the dog only needs 120 mcg is NOT a problem and will not hurt the dog.

So, **one drop for 0-80kg (0-176 lbs), monthly, to prevent heartworm.** I usually give a couple drops per dog because two drops often come out instead of just one.

A good way to use the bottle of Ivermectin is to buy an 18 gauge needle (lower numbers are wider which is needed for the thick Ivermectin) and stick that needle in the bottle and **tape it** to the bottle, **never removing it.** Then use a ONE CC plastic syringe (1 cc—not any bigger, as 1 cc will minimize dosing errors) and draw 1 or 2 drops into syringe, then remove syringe—**without the needle,** of course, as the needle is firmly taped to bottle--and then place a drop or two of Ivermectin in mouth or in food of animal. Rinse the syringe and set it back in needle that is taped into bottle rubber stopper. Note that reusing plastic syringe this way can theoretically contaminate needle in bottle and possibly bottle contents too so I would not use this bottle for injection purposes, but only for oral administration. As explained elsewhere, there is no need to inject Ivermectin anyway.

Keep your bottle of Ivermectin stored away from direct sunlight and below 86 degrees Fahrenheit (30 degrees Celsius).

Note that a 50 ml/cc bottle of Ivermectin at 20 drops per ml/cc is 1,000 drops. At the approximately \$5 per ‘Heartgard’ pill vets charge you can see that a 50 ml/cc bottle with 1,000 doses that you paid \$20 for is ‘worth’ more than \$5,000 at the rate vets charge for HeartGuard heartworm prevention tablets.

That is, it is better to save thousands of dollars by using a bottle of Ivermectin and then every 6 months to one year giving your dog a ‘real’ deworming.

List of Medicines to order.

Ones in bold/underlined are ‘must haves’.

Ivermectin, brand names vary (make sure it says 1%). In Thailand known as **Vescomec** and **Ivomec**. 50cc or 100cc bottle, and also 250 cc bottles. I prefer the smaller bottles as they are easier to transport on my daily trips to see the sick dogs. Tape a #18 needle inside rubber stopper, then use 1cc syringe to

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withdraw and administer ORALLY with syringe without the needle (it's taped inside rubber stopper, remember?). You do NOT need to inject

ivermectin. Leave the needled taped securely in rubber stopper of bottle so the needle cannot come out when you use your 1 cc syringe to withdraw Ivermectin.

flea/tick powder, available everywhere, cheap, and very effective.

Amoxicillin) 500 mg 1 bottle of 500 caps. A good 'all purpose' antibiotic. Very cheap. Works for most things your dogs will have.

Cephalexin 500 mg. A 'premier' antibiotic for skin, ear and urinary tract.

Doxycycline: reserve this medicine for treating dogs that have had ticks attached to them. Will kill 'stealth' organisms injected from ticks. Doxycycline is used to treat human gonorrhea, syphilis, Chlamydia, pneumonia and other respiratory tract infections; Lyme disease; acne; infections of skin, genital, and urinary systems; and anthrax (after inhalational exposure). It is also used to prevent malaria. So you see it is good to have in your kit for dogs and humans

Prednisolone 5 mg tablets. Fantastic med to help with itching & severe illness or poisoning—do not give to dog with Demodex mange, though, as it suppresses an already-suppressed immune system.

Helmentacide de-worming meds. Helmentacide is brand name in Thailand. Cost: less than a \$1 to deworm a 10kg dog. Whatever your brand name in whatever country, look for the following ingredients: Pyrantel, Febantel, Praziquantel

Activated charcoal, but often called 'car-bon'—long 'o'—in Thailand), absolutely necessary in your kit for suspected poisonings or diarrhea. Used to save human lives, too, in every emergency room worldwide. I carry some with me no matter where I am—take a 3 or 4 capsules at first sign of feeling unwell for 'regular' food poisoning. For more severe poisonings—in massive toxic substance poisoning—take 1g/kg, so a 100kg person takes 200 capsules (300 mg each). But for 'regular' food poisoning, only take 3 or 4 or a few more than that. Non-toxic in any amount, so don't hesitate to eat them. Give to dogs you suspect have been poisoned (dogs will appear 'sick': lethargic, depressed and not eating). Give 2 or 3 capsules for every kilogram the animal weighs if you think the dog has eaten some poison.

Iodine (Betadine, Polidone) good to put on wounds, bites, etc.

Syringes box of 1 cc (without needle). I use one syringe for squirting ivermectin in mouth or in milk, etc until it no longer works then I throw it away. You will use a lot of these. Also buy 5 or 6 Large 60 cc syringes (without needle) for squirting chicken soup etc into mouth of really sick dog. Buy some 3cc syringes (without needle) for administering milk or water.

Box of needles, some large (#18) size, some small (#23) size. You need #18 to tape to your bottle of Ivermectin after you have inserted needle through rubber stopper. Ivermectin is thick and is hard to

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withdraw with a smaller, #23 needle, which needles (#23) are good for injections IF—if—you have to inject something (but no need to inject Ivermectin—just give orally).

surgical gloves, box of. Wear these when touching the dogs especially their mouths.

Dexamethasone for shock, accident, poisoning. Comes in tablets or injectable. Dexamethasone is 7 times stronger than prednisolone and 27 times stronger than hydrocortisone.

Antihistamine chlorpheniramine or diphenhydramine ('Benadryl')

Shampoo with any or all of the following ingredients. Okay to buy several different brands so that you get all the following ingredients if you can't find one brand with all three. The 'top three' are: 1) Coal tar 2) Salicylic Acid 3) Sulphur. A fourth is Benzoyl Peroxide. And if you suspect a fungal skin infection then find some Ninazol shampoo, or rub-in cream, in addition to giving oral antifungal meds.

Atropine 1mg injectable. 1 box can have 50 ampules (this is antidote for most insecticide poisonings).

Griseofulvin—inexpensive antifungal medicine for 'ringworm' (dermatophytosis)

Itraconazole antifungal med for certain fungi—see Plumb's Veterinary Drug Handbook.

Meds listed below in non-boldface are helpful to have.

Acepromazine tablets 33.75 mg 1 bottle (3 or 4 or more—start slow--put in sausage will immobilize dog who won't otherwise let you get near it to treat it for wounds, etc)

Odotecide (sp?) ear meds for killing bugs in ears

Ear meds for direct application to ear canal

Terramycin (eye antibiotic). Or Dex-oph eye drops with dexamethasone plus an antibiotic.

Amitraz (this is the 'dip' that kills Demodex mites with 1 dip/week for 4-6 weeks.

Ninazol shampoo needed for bad skin cases you suspect may be fungal.

Rabies vaccinations for you

If you are helping dogs in a poor country on a regular basis then I believe you should get the three rabies prophylaxis vaccinations (3 injections over 3 or 4 weeks) and they are inexpensive if you get them in a non-tourist hospital in a poor country. Rabies is carried in the saliva of infected mammals and you do not have to be bitten to get rabies yourself. If the saliva gets in a scratch on your hand, or you breathe some droplets, you can get rabies. Note that I am against the *over*-vaccination most of us are getting, especially with vaccines that haven't had adequate testing or when patients are not given 'informed consent' which requires the patient to be informed of adverse effects and given an opportunity to consent to, or refuse, the treatment. **However, rabies vaccinations are something you should get if you are caring for dogs in a poor country.**

The most important thing to do if bitten is—BEFORE you go to a doctor/hospital—to immediately **wash any bite wound for 15 minutes** with soap and water taking a break from washing by applying iodine and/or hydrogen peroxide and/or alcohol (**even vodka or whiskey**), and then wash some more with soap and water. These things you should do *before* you go to the hospital. A dog bite is not a medical emergency requiring you to rush to the hospital, unless bitten on the face or neck, especially that of children. But, even in that case, you should still immediately wash the wound for 15 minutes with soap and water, iodine, hydrogen peroxide, alcohol more soap and water---15 minutes—then more hydrogen peroxide, alcohol and iodine—before you go to the hospital. You can remove a lot of the virus particles that way.

Rabies is transmitted through saliva into an open wound or mucous membrane (including eyes), and there is a lot of rabies in Thailand and other poor countries, so make sure you get the rabies vaccinations. Get the vaccinations in the poor country because they are inexpensive there, maybe \$50 for the series of vaccinations in a poor country versus \$1,000 in a Western country. Taking 2,000-4,000 IU of Vitamin D3 daily and extra magnesium is good for every person but is essential before you get vaccinated for anything. And put a cold pack on the site of vaccination for two hours afterwards, and on then off during the next 24 hours, which will reduce the harmful inflammation that is triggered in the brain. (This advice per Dr Russell Blaylock, MD neurosurgeon).

Rabies is carried in the saliva of dogs and other mammals. Getting bitten by a rabid animal is NOT the only way to get rabies. If rabies saliva comes in contact with an open wound on you—or in your mucous membranes (eyes, nose, etc) —you can get rabies, a fatal disease with virtually no cure once you come down with symptoms but no one—whether previously vaccinated or not—who has received prompt post-exposure treatment has ever died from rabies. But since you will be exposed to the saliva of dogs, it is much better to get the prophylactic vaccines. Note: below the '0' (zero) means the day of your first vaccination.

Pre-exposure vaccine schedule: 3 doses on days 0, 7, 21 (or 28). Booster dose: 1ml every 2-5 years.

Post-exposure vaccine schedule: Previously vaccinated: 2 doses at 0 and 3 days. But if you've had **No prior rabies vaccine then you need:** 4 doses at 0, 3, 7, and 14 days **and** Rabies Immune Globulin (RIG) with first dose.

*“(post-exposure) **Treatment may be discontinued if the animal involved (dog or cat) remains healthy throughout an observation period of 10 days;** or if the animal is killed humanely and found to be negative for rabies by laboratory examination. Any biting animal suspected of being rabid should be immediately killed humanely and tissues examined using appropriate laboratory technique(s). In areas where canine or wildlife rabies is epizootic, adequate laboratory and field experience, indicating that there is no infection in the species involved, may justify local health authorities in not recommending specific anti-rabies treatment. Obviously modification of the recommended procedures would be indicated in a rabies-free area where animal bites are encountered”.*

http://www.who.int/rabies/human/WHO_strategy_prepost_exposure/en/

The hallmark clinical sign of rabies infection in a mammal is not foaming at the mouth or crazed growling, although both these things can indicate rabies. **The hallmark clinical sign of rabies is acute unexplained paralysis and/or strange behavior**, such as a normally active-only-at-night animal seen walking around in the day, or an animal that normally never approaches humans, you see it approaching people, or a dog that just walks up to you (as happened to me) and bites you for ‘no reason’. A cow, for example, that is acting ‘hyper’ and ‘overly excited’ could very well have rabies. A fox with porcupine quills in it is considered to have rabies until proven otherwise (because healthy foxes won’t approach a porcupine). In the USA, most human rabies cases are not from dogs but from bats and this is a problem because often people are **bitten by a bat when they are asleep and don’t realize it**. Anytime **a bat is found in the bedroom** is cause for the person who has slept there to seek medical attention. It is now standard practice to give rabies vaccinations and Rabies immune globulin (RIG) in a case like this even if there is no visible bite mark.

To be on the safe side, get the vaccinations before you start engaging in close contact with dogs in poor countries. But don’t assume the vaccinations will protect you if you are bitten. **The vaccinations should be considered your ‘backup’.** **Prompt washing of the wound** for *at least 10* minutes with soap and water **should be your number one priority**. If you are away from running water then immediately pour on the wound some of the bottled water, betadine/iodine, hydrogen peroxide, and/or alcohol that you should always have in your pack. Scrub it well. Then pour some more liquid on. **The rabies virus take a long time to migrate from the wound to your nervous system so never think it is too late to wash the wound. But you should always try to wash any bite wound pronto-ASAP-immediately with soap and water for 10 minutes BEFORE going to the hospital for rabies shots if they are indicated.**

Remember that rabies is found in poor countries like Thailand much more than in rich countries. Thousands of people die every year in poor countries from rabies. Don’t you be one of them.

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Rabies is always fatal ***if left untreated*** and rabies is endemic in poor countries and since you will be exposed to the saliva of dogs whether bitten or not, it is strongly recommended that you get the three pre-exposure vaccinations. Much, much cheaper to do this in the poor country where you are rather than in a Western country. Because rabies is so serious I am including below a lengthy excerpt from the Merck Veterinary Manual (reprinted with permission)

Previous recommendations were washing the wound for 5 minutes. But we know now that the rabies virus particles remain at the wound site for a 'long' time and your washing the wound for 15 minutes can help to remove those particles. Remember, the virus is headed for your nervous system where it will, over the days or weeks or months, travel to your brain and, once in the brain, rabies is virtually incurable. But washing the wound, then getting the necessary post-exposure treatment from a health care professional will prevent rabies reaching the brain. No one—whether previously vaccinated or not-- who has received prompt post-exposure treatment has ever died from rabies.

If you are bitten but you've never been vaccinated then you need to get the four post-exposure shots plus Rabies immune globulin (RIG). But, if you already received the three pre-exposure vaccinations and you are subsequently bitten, then you need just 2 post-exposure vaccinations but not the rabies immune globulin (RIG). Note that the Rabies immune globulin (RIG) is expensive. I had to get it when I was first bitten in Bangkok because I had no prior vaccinations. The Rabies immune globulin (RIG) cost about \$350 then, but it is much more expensive elsewhere, such as in developed countries costing a thousand dollars or even two thousand. Even the vaccinations can cost a thousand in rich countries. Which is another reason for you to get the three pre-exposure vaccinations in a poor country and you will then not need to get the expensive Rabies immune globulin (RIG) if you are subsequently bitten. The three pre-exposure vaccinations can cost as little as \$10 each (or less) in a poor country—and if you are subsequently bitten you will only need a limited post-exposure regimen of 2 inexpensive doses of vaccine.

So: pre-exposure regimen is **3** vaccinations, which are inexpensive in poor countries. And if you are subsequently bitten, then you only need 2 inexpensive post-exposure vaccinations but *not* the Rabies immune globulin (RIG).

But, if you never got the pre-exposure regimen and you are bitten now you will need **4** post-exposure vaccinations PLUS expensive rabies immune globulin (RIG).

And if you've already been vaccinated (pre-exposure) and you are subsequently bitten, make sure the hospital does not give you three or four or even five shots—as they have tried to do to me. **Explain to them you were already vaccinated and you just need two post-exposure shots spaced 3 day apart.** They still may insist but hold your ground—they are just confusing the pre with the post exposure schedules. Or print out the info from the Merck Manual Professional available free online, and hand it to them. I highly recommend you get the three pre-exposure prophylactic vaccinations because of the dangers of rabies and the fact that you are working closely with dogs in a poor country. Rabies is endemic in poor countries and you WILL be exposed to the saliva of dogs, even if you aren't bitten. It is possible to get rabies even if not bitten—if, for example, saliva from a rabid animal gets in a cut or

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scratch, or possibly even inhaled. Much, much better to be safe than sorry: **get the 3 pre-exposure vaccinations in the poor country**, as they are incredibly inexpensive there, as opposed to hundreds of dollars in the West.

In addition to the info below you are encouraged to become familiar with the National Association of State Public Health Veterinarians (NASPHV) website, which has some good info including their info on rabies here: <http://www.nasphv.org/Documents/RabiesCompendium.pdf> As well as their 'Standard Precautions' here: <http://www.nasphv.org/Documents/VeterinaryPrecautions.pdf> Below is a lengthy discussion of Rabies from the Merck Veterinary Manual <http://www.merckvetmanual.com/mvm/index.jsp>

You can access the Merck Vet Manual online but owning a copy of the book is a good idea. The latest edition will cost around \$50 but you can often find an earlier addition for just a few dollars. The manual contains around 3,000 pages and contains some great medical writing that is not difficult to understand.

Below reprinted with permission of Merck Veterinary Manual.

Rabies is an acute, progressive viral encephalomyelitis that principally affects carnivores and bats, although it can affect any mammal. The disease is fatal, once clinical signs appear. Rabies is found throughout the world, but a few countries claim to be free of the disease due either to successful elimination programs or to their island status and enforcement of rigorous quarantine regulations.

Etiology and Epidemiology

Rabies is caused by lyssaviruses in the Rhabdovirus family. Lyssaviruses are usually confined to one major reservoir species in a given geographic area, although spillover to other species is common. Identification of different virus variants by laboratory procedures such as monoclonal antibody analysis or genetic sequencing has greatly enhanced understanding of rabies epidemiology. Generally, each virus variant is responsible for rabies virus transmission between members of the same species in a given geographic area.

From an epidemiologic perspective, it is common to use the name of the species acting as the reservoir and vector as an adjective. For example, rabies maintained by dog-to-dog transmission is termed canine rabies, whereas rabies in a dog as a result of infection with a variant from a different reservoir animal, eg, skunk (or fox), would be referred to as skunk (or fox, etc) rabies in a dog.

In North America, distinct virus variants are responsible for rabies in red and Arctic foxes in Canada and Alaska, raccoons along the eastern seaboard, gray foxes in Texas, and a closely related variant in gray foxes in the southwestern USA. Two different variants are responsible for rabies in striped skunks, one in the south central states and the other in the north central states. Another skunk rabies virus variant is found in California. The epidemiology of rabies in bats is complex. In general, each variant found in bats may be characterized with a predominant bat species. Spillover from bats to terrestrial animals is seen infrequently. Most human cases of rabies in the USA in the past decade have been caused by bat

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*rabies virus variants (especially viruses associated with *Lasionycteris noctivagans*, the silver-haired bat, and *Perimyotis subflavus*, the tricolored bat).*

Reservoirs of rabies vary throughout the world. Canine rabies predominates in Africa, Asia, Latin America, and the Middle East. In North America and Europe, where canine rabies has been eliminated, rabies is maintained in wildlife.

*For many years, skunks were the most commonly reported rabid animal in the USA, but since 1990, rabid raccoons have been the most numerous. Canine rabies became established in dogs and coyotes (*Canis latrans*) in southern Texas, but was eliminated. Canine rabies persists in Mexico, with the potential to spread throughout the USA if reintroduced. Skunk, raccoon, and fox rabies are each found in fairly distinct geographic regions of North America, although some overlap occurs. Bat rabies is distributed throughout the Americas. The vampire bat is an important reservoir in Latin America, and is the source of multiple outbreaks in cattle, as well as in humans, particularly in parts of Amazonia.*

In Europe, red fox rabies predominated before its elimination by oral vaccination. In parts of eastern Europe, rabies in raccoon dogs is of increasing concern. Rabies in insectivorous bats may be widely distributed in Europe.

Other wild species play an important role in the transmission of rabies in certain areas, including mongooses in the Caribbean, southern Africa, and parts of Asia; jackals in parts of Africa; and wolves in parts of northern Europe.

*All rabies reservoirs are also vectors of the virus, but not all vectors are reservoirs. For example, cats can effectively transmit the virus, but no cat-to-cat transmission of rabies persists, and no unique feline rabies virus variant has been documented. However, cats are the most commonly reported rabid domestic animal in the USA. Virus is present in the saliva of rabid cats, and people have developed rabies after being bitten by rabid cats. **Reported cases in domestic cats have outnumbered those in dogs in the USA** every year since 1990.*

Transmission and Pathogenesis

*Transmission almost always occurs via introduction of virus-laden **saliva into tissues**, usually by the bite of a rabid animal. Although much less likely, it is possible for virus from saliva, salivary glands, or brain to cause infection by entering the body through fresh wounds or intact mucous membranes. **Usually, saliva is infectious at the time that clinical signs occur, but it is possible for domestic dogs, cats, and ferrets to shed virus for several days before onset of clinical signs.** Viral shedding in skunks has been reported for up to 8 days prior to onset of signs. Rabies virus has not been isolated from skunk musk (spray).*

The incubation period is both prolonged and variable. Typically, the virus remains at the inoculation site for a considerable time. The unusual length of the incubation period helps to explain the effective action of local infiltration of rabies immune globulin (RIG) during human postexposure prophylaxis, even days after exposure. Most rabies cases in dogs develop within 21–80 days after exposure, but the

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incubation period may be shorter or considerably longer. One reliably recorded case of rabies in a human in the USA had an incubation period greater than 6 years.

The virus travels via the peripheral nerves to the spinal cord and ascends to the brain. After reaching the brain, the virus travels via peripheral nerves to the salivary glands. If an animal is capable of transmitting rabies via its saliva, virus will be detectable in the brain. Virus is shed intermittently in the saliva.

Hematogenous (via blood) spread does not occur. Under most circumstances, there is no danger of aerosol transmission of rabies virus. However, aerosol transmission has occurred under very specialized conditions in which the air contains a high concentration of suspended particles or droplets carrying viral particles. Such conditions have been responsible for laboratory transmission under less than ideal containment situations. There has been a suggestion of rare natural aerosol transmission in a cave inhabited by millions of bats. Oral and nasal secretions containing virus were probably aerosolized from tens of thousands of rabid bats. Aerosol infection may occur via direct attachment of the virus to olfactory nerve endings.

Clinical Findings

Clinical signs of rabies are rarely definitive. Rabid animals of all species usually exhibit typical signs of CNS disturbance, with minor variations among species. The most reliable signs, regardless of species, are acute behavioral changes and unexplained progressive paralysis. Behavioral changes may include sudden anorexia, signs of apprehension or nervousness, irritability, and hyperexcitability (including priapism). The animal may seek solitude. Ataxia, altered phonation, and changes in temperament are apparent. Uncharacteristic aggressiveness may develop—a normally docile animal may suddenly become vicious. Commonly, rabid wild animals may lose their fear of humans, and species that are normally nocturnal may be seen wandering about during the daytime.

The clinical course may be divided into 3 general phases—prodromal, acute excitative, and paralytic/endstage. However, this division is of limited practical value because of the variability of signs and the irregular lengths of the phases. During the prodromal period, which lasts ~1–3 days, animals show only vague nonspecific signs, which intensify rapidly. The disease progresses rapidly after the onset of paralysis, and death is virtually certain a few days thereafter. Some animals die rapidly without marked clinical signs.

The term “furious rabies” refers to animals in which aggression (the acute neural excitative phase) is pronounced. “Dumb or paralytic rabies” refers to animals in which the behavioral changes are minimal, and the disease is manifest principally by paralysis.

Furious Form

This is the classic “mad-dog syndrome,” although it may be seen in all species. There is rarely evidence of paralysis during this stage. The animal becomes irritable and, with the slightest provocation, may viciously and aggressively use its teeth, claws, horns, or hooves. The posture and expression is one of

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alertness and anxiety, with pupils dilated. Noise may invite attack. Such animals lose caution and fear of humans and other animals. Carnivores with this form of rabies frequently roam extensively, attacking other animals, including people, and any moving object. They commonly swallow foreign objects, eg, feces, straw, sticks, and stones. Rabid dogs may chew the wire and frame of their cages, breaking their teeth, and will follow a hand moved in front of the cage, attempting to bite. Young pups can seek human companionship and are overly playful, but bite even when petted, usually becoming vicious in a few hours. Rabid skunks may seek out and attack litters of puppies or kittens. Rabid domestic cats and bobcats can attack suddenly, biting and scratching viciously. As the disease progresses, muscular incoordination and seizures are common. Death results from progressive paralysis.

Paralytic Form

This is manifest by ataxia and paralysis of the throat and masseter muscles, often with profuse salivation and the inability to swallow. Drooping of the lower jaw is common in dogs. Owners frequently examine the mouth of dogs and livestock searching for a foreign body or administer medication with their bare hands, thereby exposing themselves to rabies. These animals may not be vicious and rarely attempt to bite. The paralysis progresses rapidly to all parts of the body, and coma and death follow in a few hours.

Species Variations

Cattle with furious rabies can be dangerous, attacking and pursuing humans and other animals. Lactation ceases abruptly in dairy cattle. The usual placid expression is replaced by one of alertness. The eyes and ears follow sounds and movement. A common clinical sign is a characteristic abnormal bellowing, which may continue intermittently until shortly before death.

Horses and mules frequently show evidence of distress and extreme agitation. These signs, especially when accompanied by rolling, may be interpreted as evidence of colic. As in other species, horses may bite or strike viciously and, because of their size and strength, become unmanageable in a few hours. People have been killed outright by such animals. These animals frequently have self-inflicted wounds.

Rabid foxes and coyotes often invade yards or even houses, attacking dogs and people. One abnormal behavior that can occur is demonstrated by the fox that attacks a porcupine; finding a fox with porcupine quills can, in many cases, support a diagnosis of rabies.

Rabid raccoons and skunks typically show no fear of humans and are ataxic, frequently aggressive, and active during the day, despite their often crepuscular nature. In urban areas, they may attack domestic pets.

In general, rabies should be suspected in terrestrial wildlife acting abnormally. The same is true of bats that can be seen flying in the daytime, resting on the ground, paralyzed and unable to fly, attacking people or other animals, or fighting.

Rodents and lagomorphs rarely constitute a risk for rabies virus exposure. However, each incident should be evaluated individually. Reports of laboratory-confirmed rabies in woodchucks are not uncommon in association with the raccoon rabies epizootic in the eastern USA.

Diagnosis

Clinical diagnosis is difficult, especially in areas where rabies is uncommon and should not be relied on when making public health decisions. In the early stages, rabies can easily be confused with other diseases or with normal aggressive tendencies. Therefore, when rabies is suspected and definitive diagnosis is required, laboratory confirmation is indicated. Suspect animals should be euthanized and the head removed for laboratory shipment.

Rabies diagnosis should be done by a qualified laboratory, designated by the local or state health department in accordance with established standardized national protocols for rabies testing. Immunofluorescence microscopy on fresh brain tissue, which allows direct visual observation of a specific antigen-antibody reaction, is the current test of choice. When properly used, it can establish a highly specific diagnosis within a few hours. Brain tissues examined must include medulla oblongata and cerebellum (and should be preserved by refrigeration with wet ice or cold packs). The mouse inoculation test or tissue culture techniques using mouse neuroblastoma cells may be used for confirmation of indeterminate fluorescent antibody results, but it is no longer in common use in the USA.

Control

Comprehensive guidelines for **control in dogs** have been prepared internationally by the World Health Organization and in the USA by the National Association of State Public Health Veterinarians (NASPHV). They include the following: 1) notification of suspected cases, and euthanasia of dogs with clinical signs and dogs bitten by a suspected rabid animal; 2) reduction of contact rates between susceptible dogs by leash laws, dog movement control, and quarantine; 3) mass immunization of dogs by campaigns and by continuing vaccination of young dogs; 4) stray dog control and euthanasia of unvaccinated dogs with low levels of dependency on, or restriction by, humans; and 5) dog registration.

The Compendium of Animal Rabies Control, compiled and updated annually by the NASPHV, summarizes the most current recommendations for the USA and lists all USDA-licensed animal rabies vaccines that are marketed in the USA. Many effective vaccines, such as modified live virus, recombinant, and inactivated types, are available for use throughout the world; in the USA, no modified live rabies virus vaccines are currently marketed (for any species). **Recommended vaccination frequency is every 3 yr, after an initial series of 2 vaccines 1 yr apart.** Several vaccines are also available for use in cats, and a few for use in ferrets, horses, cattle, and sheep. Because of the increasing importance of rabies in cats, vaccination of cats is extremely important. No parenteral vaccine is approved for use in wildlife. Protective immunity from the commercially available vaccines for domestic species has not been definitively demonstrated in these species.

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Until recently, the control of rabies in wildlife populations relied on population reduction of wildlife in an attempt to reduce the contact rate between susceptible animals; however, this proved difficult and often not publicly acceptable, ecologically sound, economically warranted, or programmatically effective. In Europe and Canada, use of oral vaccines distributed in baits to control fox rabies has been widespread and effective. The disease in foxes has been eliminated from most of western Europe and curtailed significantly in Ontario. Use of a vaccinia-rabies glycoprotein recombinant virus vaccine in the USA has successfully eliminated coyote rabies in southern Texas and has limited the western expansion of raccoon rabies from the eastern USA. The license limits use of the vaccine to state or federal rabies programs; it is not available to private veterinarians or for individual animal use. Together with other vaccines, it is also being used to assist in the control of dog rabies in developing countries.

Management of Suspected Rabies Cases—Exposure of Pets

Where terrestrial wildlife or bat rabies is known to occur, any animal bitten or otherwise exposed by a wild, carnivorous mammal (or a bat) not available for testing should be regarded as having been exposed to rabies. The NASPHV recommends that any unvaccinated dog, cat, or ferret exposed to rabies be euthanized immediately. If the owner is unwilling to do this, the animal should be placed in strict isolation (ie, no human or animal contact) for 6 mo and vaccinated against rabies 1 mo before release. If an exposed animal is currently vaccinated, it should be revaccinated immediately and closely observed for 45 days.

Zoonotic Risk (zoonotic means an infectious disease transmitted from animal to human)

When a person is exposed to an animal suspected of having rabies, the risk of rabies virus transmission should be evaluated carefully. Risk assessment should include consideration of the species of animal involved, the prevalence of rabies in the area, whether exposure sufficient to transmit rabies virus occurred, and the current status of the animal and its availability for diagnostic testing. Wild carnivores and bats present a considerable risk where the disease is found, regardless of whether abnormal behavior has been observed. Insectivorous bats, though small, can inflict wounds with their teeth and should never be caught or handled with bare hands. Bat bites may be ignored or go unnoticed, so direct contact with bats could be considered a risk for virus exposure. Any wild carnivore or bat suspected of exposing a person to rabies should be considered rabid unless proved otherwise by laboratory diagnosis; ideally, this includes bats in direct contact with people, such as those found in rooms with sleeping or otherwise unaware persons. Wildlife, including wolf hybrids, should never be kept as pets; if one of those animals exposes a human or domestic animal, the wild animal should be managed like free-ranging wildlife.

Any healthy domestic dog, cat, or ferret, whether vaccinated against rabies or not, that exposes (bites or deposits saliva in a fresh wound or on a mucous membrane) a person should be confined for 10 days; if the animal develops any signs of rabies during that period, it should be euthanized and its brain promptly submitted for rabies diagnosis. If the dog, cat, or ferret responsible for the exposure is stray or unwanted, it may be euthanized as soon as possible and submitted for rabies diagnosis. Since the

advent of testing by immunofluorescence microscopy, there is no value in holding such animals to “let the disease progress” as an aid to diagnosis.

*Internationally, the World Health Organization recommends several types of cell-culture vaccines for human groups at risk. In the USA, guidelines for human rabies prevention follow recommendations prepared by the Advisory Council on Immunization Practices. **Pre-exposure immunization is strongly recommended for people in high-risk groups**, such as veterinary staff, animal control officers, rabies and diagnostic laboratory workers, and, under certain circumstances, some travelers working in countries in which canine rabies is prevalent. Pre-exposure vaccine is administered on days 0, 7, and 21 or 28. However, pre-exposure prophylaxis alone cannot be relied on in the event of subsequent rabies virus exposure and must be supplemented by a limited post-exposure regimen (2 doses of vaccine, IM, on days 0 and 3). For healthy, unvaccinated patients bitten by a rabid animal, postexposure prophylaxis consists of wound care, local infiltration of rabies immune globulin (RIG) Plus vaccine administration on days 0, 3, 7, and 14.*

(end of Merck Veterinary Manual quotation)

Cancer

For cancer in dogs or humans, I recommend you get “Natural Strategies for Cancer Patients”(book) by Dr Russell Blaylock, MD (neurosurgeon, retired) and use all the techniques in there including the all-important green vegetable drinks (for dogs make drinks with chicken soup as a base). Dogs need vegetables, too, and often the first thing they eat is the digestive contents of an animal which contains vegetable matter, and of course dogs ‘graze’ on grasses, weeds, etc. I’ve used this book to heal both animals and humans including one friend with Stage IIIB lung cancer “with direct extension to the spine” (“tentacles that came from the baseball-size tumor on his lung and wrapped around his spine, ‘eating’ it). The doctors said he’d only live a short time even with the chemo and radiation he was receiving. Now, years later, his oncologists can find zero cancer in him. The supplements and other protocols Dr Blaylock recommends in his book not only greatly enhance the killing power of the chemo and radiation but they also protect the body from the harmful effects of the chemo and radiation. In pubmed.gov there are tens of thousands of citations in the scientific literature on these supplements that Dr Blaylock mentions. You can research them yourself at www.pubmed.gov.

Curcumin

For example, the extract from the India spice, turmeric, is called curcumin. Cancer labs in every country are in a frenzy studying this amazing extract for its ability to cure or help everything from cancer to diabetes to neurodegenerative diseases (Alzheimer’s, etc), to wound healing to strokes and heart attacks and even to allow nerves to completely regrow after nerve-crush injuries. There are over 10,000 studies on curcumin alone, and if you type in the pubmed search window “curcumin cancer” you will see 4000 (as of August 2017). These studies grow day by day. You can buy curcumin at the health food store. I give curcumin twice per day to any dog with cancer or who is especially sick.

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Ivermectin data sheet

Mechanism of Action of Ivermectin

As all macrocyclic lactones, ivermectin acts as agonist of the GABA (gamma-aminobutyric acid) neurotransmitter in nerve cells and also binds to glutamate-gated chloride channels in nerve and muscle cells of invertebrates. In both cases it blocks the transmission of neuronal signals of the parasites, which are paralyzed and expelled out of the body, or they starve. It also affects the reproduction of some parasites by diminishing oviposition or inducing an abnormal oogenesis. In mammals the GABA receptors occur only in the central nervous system (CNS), i.e. in the brain and the spinal chord. But mammals have a so-called blood-brain barrier that prevents microscopic objects and large molecules to get into the brain. Consequently macrocyclic lactones are much less toxic to mammals than to parasites without such a barrier, which allows quite high safety margins for use on livestock and pets. A notable exception to this are dog breeds that carry the MDR-1 gene defect (see later).

(HG note: "LD50" refers 'Lethal Dose 50%, that is, the dose at which 50% of the animals die.

Acute Toxicity of Ivermectin

LD50 acute, mice, p.o. 25 mg/kg

LD50 acute, rat, p.o. 50 mg/kg

LD50 acute, rat: dermal >600 mg/kg

LD50 acute, dog without MDR-1 gene defect: p.o. 80 mg/kg

LD50 acute, dog with MDR-1 gene defect: p.o. 0.2 mg/kg

Ivermectin Tolerance

Dogs without MDR-1 gene defect

Safety margin: ~4

After single dose delivery, oral

2.0 mg/kg: usually without neurotoxic symptoms

2.5 mg/kg: mydriasis (dilatation of the pupils)

5.0 mg/kg: mydriasis, tremor (uncoordinated trembling or shaking movements)

10 mg/kg: mydriasis, serious tremor, ataxia (uncoordinated movements)

40 mg/kg: coma (persistence unconsciousness), death possible

(HG note: 40mg/kg is 80 times (!) the normal oral amount of 0.5mg/kg you give dogs with mites but note that Collies etc ('*dog with MDR-1 gene defect*') you only have to give them 0.2mg/kg Ivermectin to kill them. Do not give Ivermectin to Collies, sheepdogs, etc UNLESS you are just giving them the one DROP per month to prevent heartworms).

Daily oral administration during 14 days

0.5 mg/kg/day: usually without symptoms

1.0 mg/kg/day: mydriasis (dilatation of the pupils)

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Single subcutaneous injection

4.7 mg/kg: mydriasis (dilatation of the pupils), salivation

9.7 mg/kg: ataxia (uncoordinated movements), depression, death

(HG note: if injected Ivermectin has a much lower margin of safety, which is yet another reason NOT to inject.)

Dogs with MDR-1 gene defect

Lowest single oral dose without symptoms: 0.06 mg/kg (= 60 mcg/kg)

Doses > 0.1 mg/kg (= 100 mcg/kg) cause massive neurological symptoms: mydriasis (dilatation of the pupils), tremor (uncoordinated trembling or shaking movements), ataxia (uncoordinated movements), vomit

Doses > 0.15 mg/kg (= 150 mcg/kg) cause comatose state and possible death

Cats

Cats, including exotic breeds (e.g. Siamese, Persian) usually tolerate well doses up to 1 mg/kg. But cat intoxications have also been reported.

Oral pastes for horses are not recommended at > 0.5 mg/kg.

Toxic Symptoms caused by Ivermectin Poisoning

General symptoms

The symptoms of ivermectin poisoning are the consequence of an excessive concentration of the molecule in the CNS (Central Nervous System) and the subsequent increase of GABA activity. Ivermectin stimulates the release of the GABA neurotransmitter (gamma-Aminobutyric acid) in the presynaptic neurons and enhances its postsynaptic binding to its receptors. This increases the flow of chloride ions in the neurons, which causes hyperpolarization of the cell membranes. This on its turn disturbs normal nervous functions and causes a general blockage of the stimulus mechanisms in the CNS. The resulting cerebral and cortical deficits include mainly

Ataxia (uncoordinated movements)

Hypermetria (excessive or disproportionate movements)

Disorientation

Hyperesthesia (excessive reaction to tactile stimuli)

Tremor (uncoordinated trembling or shaking movements)

Mydriasis (dilatation of the pupils); in cattle and cats also myosis (contraction of the pupils)

Recumbency (inability to rise)

Depression

Blindness

Coma (persistence unconsciousness)

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As a general rule, young animals are more sensitive to overdosing, react stronger and prognosis is worse than for adult animals.

Besides erroneous dosing, overdosing can occur due to excessive licking after pour-on delivery to livestock (usually licking of other animals in the same herd) or spot-on delivery to dogs and cats (particularly in cats due to intense grooming).

Frequent administration errors in livestock include intramuscular or intravenous instead of subcutaneous injection. This results in excessive blood levels. Another frequent error is repeated unintended treatment in short intervals due to animal mistaking.

A frequent administration error in dogs is partial administering to small dogs of tablets or spot-ons approved for large animals.

A frequent administration error in cats is partial administration to cats of tablets or spot-ons approved only for dogs.

Poisoning Symptoms in Dogs

In dogs without the MDR-1 gene defect, the dominant poisoning symptom is extreme mydriasis (dilatation of the pupils) together with incomplete and deregulated pupillary reflex. Mydriasis in both eyes is the most sensitive indicator of ivermectin intoxication and the most frequent symptom in dogs.

At higher doses and in dogs with the MDR-1 gene defect other symptoms have been observed as well: weakness, lethargy, hypothermia (too low body temperature), hypersalivation (drooling), vomit, difficult breathing, behavioral disturbances, confusion, seizure, death.

Symptoms develop usually 5 to 24 hours after treatment and can last for several days until coma. As a general rule, poisoning is more serious and prognosis is worse if the symptoms develop faster.

Poisoning Symptoms in Cats

Poisoning symptoms in cats resemble those in dogs. Additional symptoms reported are diarrhea, anorexia (lack of appetite), posterior paralysis, disturbed or lacking reflexes.

As a general rule neurological symptoms in cats tend to recede in the days following poisoning and most cats recover within 2 to 4 weeks.

Ivermectin Side Effects, Adverse Drug Reactions (ADRs) and Warnings

Due to lack of data and the higher susceptibility in young animals it is advisable not to administer cattle and horses younger than 4 months, as well as puppies and kittens younger than 6 weeks.

Due to lack of data it is also advisable not to administer ivermectin to pregnant sows before the 40th day of gestation, and to pregnant mares before the 45th day of gestation.

After ivermectin injection a painful and rather large swelling may develop at the injection site. It usually recedes in a few days.

In horses, the risk of *Chlostridium* infection after injection is particularly high. If left untreated such infections are fatal. However it is not related to ivermectin, but to the use of contaminated needles. For this reason in most countries ivermectin for horses is usually available only as oral paste and not as an injectable.

In dogs and cats administration of spot-ons can cause a reversible skin irritation. Alopecia (hair loss) and squamation (appearance of skin scales) have also been reported.

Never use spot-ons or tablets for dogs on cats, and never use spot-ons or tablets for large dogs on small dogs. It happens that some users want to save money buying large tablets or spot-ons for treating smaller dogs (or even cats!) twice or more times. The risk of overdosing is considerable, either due to erroneous calculations or to unskilled manipulation. In addition, dog medicines may sometimes contain ingredients that are toxic to cats.

WARNING: Dogs of some breeds do not tolerate ivermectin, other macrocyclic lactones or other drugs (e.g. emodepside) that can cross the blood-brain barrier. They can suffer more or less serious adverse effects if treated at dose rates slightly higher than the recommended ones. Consequently dosing must be as accurate as possible. This is the case for Collies and related breeds, which have a mutation in the MDR-1 gene that affects the blood-brain barrier and makes it more permeable to such compounds than in dogs without this mutation. Besides Collies, other dog breeds have shown similar problems, although the MDR-1 mutation has not been confirmed in all of them. The breeds more affected by this mutation are (% frequency): Collie (70%), Long-haired Whippet (65%), Australian Shepherd (50%, also mini), McNab (30%), Silken Windhound (30%), English Shepherd (15%), Shetland Sheepdog (15%), English Shepherd (15%), German Shepherd (10%), Herding Breed Cross (10%). Other less affected breeds are: Old English Sheepdog, Border Collie, Berger Blanc Suisse, Bobtail, Wäller. The only way to be sure that a dog is affected or not is to test for it. As more dogs are tested it is likely that the mutation is discovered in other breeds, or that the frequencies change.

Complications in dogs, cats and horses due to Dirofilaria

Most products with ivermectin and other macrocyclic lactones are effective against heartworm larvae in the blood. Heartworm infection (*Dirofilaria* spp) is a common disease in dogs in regions with hot or mild weather. The disease is called dirofilariasis and is transmitted by mosquitoes. It is less frequent in cold regions but can occur there as well. Cats and horses can be affected too. Heartworm preventatives hinder larvae (*microfilariae*) in the pet's blood to develop to adult worms. **The sudden death of microfilariae releases enormous amounts of allergens that can cause an allergic shock.** The following symptoms may develop about 5 hours after treatment: pale mucosae, tachypnea (rapid breathing), dispnea (difficult breathing), vomit, weak and accelerated pulse, weakness, fever and ataxia (uncoordinated movements). Therapy requires shock treatment, including administration of corticosteroids (prednisolone, dexamethasone) and fluid supply.

Another possible complication is that treatment at the therapeutic dose against microfilariae can also kill some adult worms, if not all. Now, dead adult worms in the heart or in the pulmonary artery can physically obstruct the pulmonary blood vessels with the consequent damage to the lungs, which can be fatal. This means that any dog that is treated with a macrocyclic lactone should be checked for already existing heartworm infection. If the check is positive, the heartworm infection has to be treated with other specific heartworm products under strict supervision of a veterinary doctor. (HG note: but you will not take the stray dogs to a vet first because you are in a poor country and you are treating abandoned dogs who are certainly going to get sicker if you don't treat them).

It has been reported that off-label administration of micellar formulations of ivermectin can cause anaphylactic reactions in dogs. Ivermectin is not the cause of such reactions but polysorbate 80 (= Tween 80) one of the formulation ingredients.

In horses, allergic reactions with ventral midline pruritus (=itching) and edema (swelling) are often reported. They are mostly due to the sudden death of microfilariae of *Onchocerca* spp after treatment. Left untreated swelling recedes in 5 to 10 days and itching in about 3 weeks.

Unless prescribed by a veterinary doctor, never use on dogs or cats products for livestock that are not explicitly approved for such use. There is a high risk of overdosing or of adverse drug reactions due to ingredients that are not tolerated by pets or are even toxic to them.

Antidote and Treatment of Ivermectin Intoxication

There is no antidote for ivermectin poisoning.

Treatment consists in supportive and symptomatic measures.

Most patients recover in 7 to 10 days, but recovery of comatose patients usually needs longer.

Possible measures for dogs (application to other animals is left at the discretion of the veterinary doctor)

Administration of supplemental electrolytic solutions (intravenously if required). (HG note: whether you have IV or not, you always allow the dog to drink chicken soup ORS).

Keeping the animals warm

Frequent turning of recumbent patients

Corneal protection with adequate ocular ointment

Artificial feeding (intravenous or with feeding tube)

Mechanical respiration in case of severe breathing disturbance.

If intoxication followed oral administration induce vomiting, gastric lavage, and charcoal administration are often indicated.

In case of bradycardia (low resting heart rate) administration of glycopyrrolate (0,01 mg/kg s.c.). Glycopyrrolate is a muscarinic antagonist. It is preferred over atropine because it does not cross the blood-brain barrier.

Physostigmine improves the condition of affected dogs very quickly, already 1 minute after injection of 1 mg. It is a reversible acetylcholinesterase inhibitor but is not an ivermectin antidote and must not be the only measure for treating ivermectin intoxication. It is unclear whether daily physostigmine treatments accelerate recovery. But it is very useful to confirm diagnosis and helps encouraging dog owners to continue the therapy of their intoxicated dogs. Recommended dose is 40 mcg/kg/day i.v. (administered every 12 hours). Warning: do not administer to dogs with only slight symptoms because it can enhance tremor and ataxia. To avoid bradycardia and other side effects, treatment with glycopyrrolate before physostigmine administration is advisable.

Picrotoxine, a GABA antagonist, has also been used for treating ivermectin intoxications. However, it caused severe side effects and it has a very narrow safety margin.

Intravenous lipid infusions have been used in human medicine to treat bupivacaine intoxications. They have been tried on ivermectin-intoxicated dogs, but little is still known regarding their efficacy and safety. It is postulated that they help extracting the toxic compound from contaminated tissues.

Environmental Toxicity of Ivermectin

Ivermectin is highly toxic to fish and extremely toxic to invertebrates. For this reason disposal of ivermectin residues (e.g. in empty containers) in watercourses must be absolutely avoided. There is a certain environmental risk of water pollution from run-off after pour-on administration to large cattle herds. However this risk is substantially lower than the one associated with the use of ivermectin as a crop pesticide.

Ivermectin binds strongly to soil particles and is unlikely to contaminate groundwater.

Degradation in soil depends on soil type and structure, but also on temperature. At high summer temperatures it is degraded in 1 to 2 weeks, but it can persist for up to one year at low temperatures.

Sunlight quickly degrades ivermectin solved in water. Half-life in clear and calm water oscillates between 12 and 40 hours.

Ivermectin administered to livestock is partially excreted in the feces and has a negative impact on coprophagous invertebrates (fly larvae, dung beetles, etc.) that feed or breed on dung of cattle or other livestock. Ivermectin in dung kills some invertebrates and/or hampers their development or fertility. However, it has not been demonstrated that it prevents normal dung decomposition and recycling. After decades of massive worldwide use in the livestock industry and numerous investigations, there are no reports on significant environmental problems associated with unrecycled livestock dung after ivermectin use.

Additional Information

Ivermectin belongs to the chemical class of the macrocyclic lactones.

Ivermectin is used in human medicines against human parasites.

Ivermectin is used in crop pesticides.

Ivermectin is used as a biocide in public and domestic hygiene.

Click here for technical and commercial information on ivermectin.

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above from

http://parasitopedia.net/index.php?option=com_content&view=article&id=2344&Itemid=2996

below from <http://www.inchem.org/documents/pims/pharm/ivermect.htm>

In a 14-week oral toxicity study in dogs, no treatment-related effects were observed in animals given 0.5

mg/kg/day. Dogs given 1 and 2 mg/kg/day development mydriasis and lost a small amount of weight. Four of eight dogs given 2 mg/kg/day developed tremors, ataxia, anorexia and became dehydrated (MSD, 1988).

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Dogs given oral doses of ivermectin at 10 mg/kg produced ataxia with tremor; at 40 mg/kg, death occurred due to respiratory depression (Campbell & Benz, 1984).

Collie dogs have been shown to be more sensitive than other dogs to the toxic effects of ivermectin. Depression, tremors, mydriasis, ataxia, coma and death have been seen in Collie dogs at 100 mcg/kg orally and greater, but not at the recommended dose of the commercial product (6 mcg/kg) (Campbell & Benz, 1984).

Revolution (selamectin) Vs Ivermectin: \$40 of Selamectin versus 40 cents of Ivermectin

Note that there is another product, 'Revolution' (selamectin)--for mites (mange)--that is topical (versus oral for Ivermectin), but it is very expensive, as much as \$20 or more for just one dog for just one month. **For that same \$20 you can buy a bottle of Ivermectin and treat 50 or 100 dogs.** Part of this great difference in cost is probably because Selamectin is relatively new and is still under patent, whereas Ivermectin is no longer protected by patent and can be made and sold inexpensively. Note that selamectin does not clear the heartworm 'babies' (microfilaria) in the blood stream very well the way Ivermectin does, and *"to clear an actual infection (of Sarcoptes Mange) studies show an **extra dose (of Revolution (selamectin) is usually needed after 2 weeks for reliable results**".*

(marvistavet.com). So that would mean \$40 to cure Sarcoptes Mites using Revolution (Selamectin) Versus 40 cents of Ivermectin. But, marvistavet.com mentions that *"This product(selamectin) is probably the best choice for Collies, Australian shepherds and other sensitive breeds"* (because of the danger of giving Ivermectin to Collies & Aussies)

Amitraz

Amitraz is used primarily for dogs with Demodex mange (demodicosis). But **if you have a dog with many ticks that would require a long time to remove one by one, you can instead just mix a small amount of amitraz—say 1ml/cc amitraz in 1 liter/quart water and—wearing gloves-- sponge a little of it on the dog and the ticks will fall off immediately. Wonderful medicine, Amitraz. And then give the dog a month of doxycycline daily to kill the tick-borne pathogens.**

Below from Plumb's Veterinary Drug Handbook, 2008 edition. **Anyone having a hard time obtaining a copy of Plumb's---which you Must have---just contact me and I'll help you get an electronic copy very cheap and very quick.**

Indications/Actions

In dogs, amitraz solution is used topically primarily in the treatment of generalized demodicosis. A topical spot-on solution (*ProMeris® for Dogs*) and a collar (*Preventic®*) are available for treatment and prevention of flea and tick infestation. It is also used as a general insecticidal/ miticidal agent in several other species (see label information). The pharmacologic action of amitraz is not well understood, but it is a monoamine oxidase (MAO) inhibitor (in mites) and may have effects on the CNS of susceptible organisms. It apparently also possesses

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alpha-2 adrenergic activity and inhibits prostaglandin synthesis. Amitraz can cause a significant increase in plasma glucose levels, presumably by inhibiting insulin release via its alpha2-adrenergic activity. Yohimbine (alpha2 blocker) or atipamezole can antagonize this defect. (HGG note: meaning: Yohimbine can act as 'antidote')

Administration/Suggested Dosages

Amitraz liquid concentrates are flammable until diluted with water. Do not stress animals for at least 24 hours after application of *Mitaban*[®]. When mixing with water, protect exposed skin with rubber gloves, etc. Wash hands and arms well after application to animal. Dispose of unused diluted solution by flushing down the drain. Rinse *Mitaban*[®] container with water and dispose; do not re-use. Do not re-use collar or container; wrap in newspaper and throw in trash. Avoid inhalation of vapors. Animals treated may exhibit signs of sedation; if animal is un-arousable or sedation persists for longer than 72 hours, contact your veterinarian.

Dogs: For treatment of generalized demodicosis:

a) Long and medium haired dogs should be clipped closely and given a shampoo with mild soap and water prior to first treatment. Topically treat at a concentration of 250 ppm (one 10.6 mL bottle of *Mitaban*[®] in 2 gallons of warm water, by applying to entire animal and allowing to air dry. DO NOT rinse or towel dry. Use a freshly prepared dilution for additional dogs or additional treatments. Repeat every 14 days for 3 – 6 treatments (continue until six treatments done or two successive skin scrapings demonstrate no live mites). Chronic cases may require additional courses of therapy. (Package Insert; *Mitaban*[®]—Upjohn)

b) For dogs who are only controlled with chronic therapy (as above) and whose owners accept the risk of using the drug in an "unlicensed" manner in an attempt for cure: Owners should be made aware of the risks of therapy and accept them. First, try the 250 ppm solution (as above once weekly for 4 weeks. If positive response is seen, continue until all mites eradicated (using skin scrapings) and then for an additional 30 days. If weekly 250 ppm application fails, a 500 ppm solution may be tried (1 bottle in 1 gallon of water) weekly as above. In dogs failing 500 ppm, 1000 ppm may also be attempted, but likelihood of toxicity increases and the author has no experience using it. If these methods fail, the dog is unlikely to be cured using amitraz. (Miller 1992)

c) For dogs not responding to conventional (labeled) therapy: Prepare a 0.125% solution by diluting 1 mL of the 12.5% commercially available large animal product (*Tactic*[®]) in 100 mL of water. Clip and bathe with appropriate shampoos once weekly if required. Using a sponge rub the diluted solution (0.125%) daily onto one-half of the dog's body and alternate sides on a daily basis. Air dry.

During the first week of therapy, keep dog hospitalized and observe for adverse effects. Continue therapy for 2 weeks after multiple skin scrapings are negative for mites. Dogs also receive otic (ear) therapy with a diluted solution of amitraz (1 mL of Tactic in 8.5 mL of mineral oil) every 3 – 7 days unless irritation develops and one researcher also treats dogs with pododermatitis with daily foot soaks of the 0.125% solution. Preliminary results look promising and reported adverse effects in dogs

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are low in frequency and mild. Owners accepting this un-approved therapy, must be carefully screened and trained to carefully handle the amitraz solutions.
(Mundell 1994)

For scabies in older puppies and adult dogs:

- a) Dilute and treat per label recommendation (see “a” above for demodicosis) for 3 treatments (Moriello 1992)
- b) Dilute and treat per label directions (*Mitaban*[®]; 250 ppm); apply once to three times at 2 – week intervals for a 4 – 6 week course of treatment (Foil 2003)

Catts: See warning to not use in cats below)

For demodicosis:

- a) Dilute amitraz to 125 ppm and apply every 7 – 14 days (White 2000)

Precautions/Adverse Effects/Drug Interactions

Safety has not been demonstrated in dogs less than 4 months of age. The manufacturer of *Mitaban*[®] **does not recommend use in these animals.** **Toy breeds** may be more susceptible to CNS effects (transient sedation); lower dose rates (1/2 of recommended) have been recommended in these breeds. Because of the drug’s effects on plasma glucose, use with caution in brittle diabetic patients. Reproductive safety has not been established. Use only when benefits outweigh potential risks of therapy. The most commonly reported adverse effect after amitraz topical administration is transient sedation that may persist for up to 72 hours (24 hours is usual). If treating around eyes, use an ophthalmic protectant (*e.g.*, petrolatum ophthalmic ointment) before treating.

Do not use if dog has deep pyodermas with drainage tracts; postpone application until lesions improve after treating with antibiotic and shampoo therapy. Other adverse effects include: ataxia, bradycardia, vomiting, diarrhea, hypothermia and a transient hyperglycemia. Rarely, seizures have been reported. Topical effects can include edema, erythema and pruritus. Adverse effects are more likely to be seen in debilitated, geriatric, or very small breed dogs.

Amitraz can be toxic to cats and rabbits and it is probably best to avoid its use in these species, although amitraz has been used safely in cats in diluted form for the treatment of demodicosis in cats. Amitraz may be toxic if swallowed (by either animals or humans). Beagles receiving 4 mg/kg PO daily for 90 days, demonstrated transient ataxia, CNS depression, hyperglycemia, decreased pulse rates and lowered body temperature. No animals died.

Amitraz toxicity can be significant if amitraz-containing insecticide collars are ingested. Treatment should consist of emesis, retrieval of the collar using endoscopy if possible and administration of activated charcoal and a cathartic to remove any remaining collar fragments. Because of the risk of an increased chance of gastric dilatation, gastrotomy may not be a viable option. Yohimbine at a dose of 0.11 – 0.2 mg/kg IV (start with low dosage) may be of benefit for overdose effects. **(HG Note: If you cannot take to a vet and don’t have pharmaceutical grade yohimbine, I suggest using oral yohimbine found in a health food store/pharmacy and administer it sublingually, i.e, under the tongue.**

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Sublingual administration of most meds can be very effective, even approaching that of IV).

(Plumb's continued): Because yohimbine has a short half-life it may need to be repeated, particularly if the animal has ingested an amitraz-containing collar that has not been retrieved from the GI tract. Atipamezole has also been used to treat amitraz toxicity; refer to that monograph for more information. Contact a poison center for more information, if necessary.

Because of their immunosuppressive effects, corticosteroids and other immunosuppressant drugs (e.g., azathioprine, cyclophosphamide, etc) should not be used in animals with demodicosis. Amitraz may interact with other MAO inhibitors (including selegiline) or tricyclic antidepressants (amitriptyline, clomipramine). Concomitant use is not recommended.

Clients should wear gloves when applying and wash off any product that contacts their skin.

Veterinary-Labeled Amitraz Topical Products

Product (Company) Form: Concentration Label Status Other Ingredients; Size(s); Comments

Mitaban[®] (Pfizer) Note: This product's availability has been undependable in past years; may not be available Solution for Dilution: 19.9% Rx (Vet) 10.6 mL btls. FDA labeled and approved for use on dogs. Note: Liquid is flammable until diluted.

Tactic^{®EC} (Intervet) Solution (emulsifiable concentrate) for Dilution: 12.5% OTC-EPA (Vet) 760 mL cans. EPA labeled for use on swine, dairy or beef cattle. Label states not to use on dogs or horses. *ProMeris*[®] for Dogs (Fort Dodge) Spot-On Solution: amitraz 150 mg/mL; metaflumizone 150 mg/mL OTC-EPA (Vet) Approved, but not released in USA (August 2007). See label for more details. *Preventic*[®] (Virbac) Collar: 9% amitraz; 25 inch OTC-EPA (Vet) 25 in. adjustable (cut off excess). EPA labeled for dogs 12 weeks and older only. Effective for 3 months.

strychnine poisoning

"Strychnine is a very dangerous and strong poison that is often used in baits used for killing rats, moles, gophers, and other rodents or unwanted predators. Having a very short duration of action, the clinical symptoms of strychnine poisoning typically appear within ten minutes to two hours after ingestion, resulting in sudden death. Patients often will die of strangulation due to spasming of the muscles involved in respiration."

In Thailand, to poison a dog, people will put rodent poison (often containing strychnine) in a piece of meat. Or they will just leave the blue-green stuff on the ground since it apparently is made to have a taste dogs and rodents like. Sometimes the poisoning is accidental, if someone has put it on the ground to kill rodents/rats/etc and then a dog eats it. Make sure you learn what this bait looks like so you can identify it if you see it on [the ground or in their vomit](#). [In Thailand it is a blue or green color](#).

The following are some of the symptoms of strychnine poisoning:

- Limb rigidity

- Stiff muscles

- Severe spasms leading to arching of the head, neck and back in extreme hyperextension (opisthotonus)

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Uncontrolled violent seizures (sometimes in response to bright lights or noise)

Breathing difficulties, inability to breathe

Elevated heart rate

High body temperature

Vomiting

Ataxia (difficulty walking)

“The onset of strychnine poisoning is rapid. Signs normally appear within 10 minutes to two hours after oral administration. Early signs may consist of **apprehension, nervousness, tenseness, and muscle stiffness.** (At this stage, if you have even a HINT of suspicion, and animal is not exhibiting any neurological signs like seizures, etc then hurry and induce vomiting with hydrogen peroxide and then shove down his throat 3 activated charcoal tablets for EACH kilogram the animal weighs. I would also recommend you give him valium rectally, unless you have injectable; **because** you may have already given the charcoal orally, then you don’t want to give him the valium orally because the charcoal will just adsorb it. **But do not give anything, including charcoal, orally if animal is showing neurological signs (or seizures, convulsions, arching back, etc).** But especially if you have had previous strychnine poisonings in your area, or if you have other reasons to believe this could be strychnine, then I would give the valium rectally sooner rather than later. Severe tetanic seizures may appear spontaneously or may be initiated by external stimuli such as touch, sound, or a sudden bright light. Usually, extreme and often overpowering extensor rigidity causes the animal to assume a **sawhorse stance.** The tetanic convulsion may last from a few seconds to about a minute. **Intermittent periods of relaxation** are observed during convulsions and become less frequent as the clinical course progresses. **During convulsions**, the animal exhibits opisthotonos, the **forelimbs are extended**, the **pupils are dilated**, the **eyeballs protrude**, and the mucoous membrane color is cyanotic. The frequency of the tonic-clonic seizures increases, and death eventually occurs from respiratory failure or exhaustion during seizures. **The entire syndrome, if untreated, may last less than one or two hours until death.**

DIAGNOSIS

Strychnine poisoning can be tentatively diagnosed based on a history of exposure, typical clinical signs (**rapid onset of muscular rigidity**, tonic **seizures**, **sawhorse stance**, **rapid rigor mortis**). Poisoned animals may have undigested **red or green strychnine**-laced seeds or grain such as peanuts, wheat, milo, or barley in their stomach. Analytical detection of strychnine alkaloid in the vomitus, stomach content, liver, kidneys, or urine should be considered diagnostic.

In living animals, the best chance of finding strychnine alkaloid is in stomach content (in vomitus or through stomach washings) or in urine if samples are collected within the first several hours of exposure. Samples (stomach content, liver, or kidney) should be sealed in a plastic bag, frozen, and submitted to a veterinary diagnostic laboratory for strychnine analysis.

TREATMENT

Treatment of strychnine poisoning is considered an emergency and should be instituted quickly. The

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objectives of treatment are 1) **decontamination in asymptomatic** animals, 2) **controlling seizures** and preventing asphyxiation in symptomatic animals, and 3) **supportive care** (especially give ORS electrolytes—home made gatorade (see elsewhere in manual how to make). If you have sterile saline and IV equipment you can give saline solution IV. But since you may not be near a vet---remember, animals die Fast from strychnine and he may be so messed up that you can't give fluids orally--you will probably have to give the ORS rectally. I've saved animals lives doing this, it works, and it is not messy, it is NOT an enema. An enema is water only and the water just shoots back out. But the ORS has salt and sugar in it and the body hungrily takes it all in, whether given orally or rectally. You MUST give the animal these fluids to help eliminate the strychnine (or any poison).

Decontamination

Decontamination consists of removing gastric contents either by inducing emesis or by gastric or enterogastric lavage and binding the remaining bait in the gastrointestinal tract with activated charcoal.

Since strychnine is a rapidly acting convulsant, **most animals presented to a veterinarian are already exhibiting clinical signs. Do not attempt decontamination** in animals that are **already showing neurologic effects. Control seizures and stabilize the animal first** (discussed below) **before** decontamination, but if showing no neurologic signs, seizures, etc then Make him Vomit with Hydrogen Peroxide.

Emesis. If the exposure is recent and no clinical signs are present, induce **vomiting** with **3% hydrogen peroxide** (2.2 ml/kg orally for a maximum of 45 ml in dogs; repeat once after 10 to 15 minutes if no vomiting occurs), or **apomorphine** in dogs (0.03 mg/kg intravenously; 0.04 mg/kg intramuscularly; **or** dissolve a crushed pill in physiologic saline, instill in the conjunctival sac, and rinse with water after emesis has occurred), or xylazine (cats = 0.44 mg/kg intramuscularly; dogs = 1.1 mg/kg subcutaneously or intramuscularly). Yohimbine (0.1 mg/kg intravenously in dogs) can be given to reverse the effects of xylazine.

(Harrell note: You can buy yohimbine in a health food store or pharmacy without a prescription. I have yohimbine for sublingual but not for IV; Sublingual is almost as fast as IV according to med literature so if you somehow end up overdosing animal on xylazine then put some drops of yohimbine under his tongue. Also note that much **hydrogen peroxide in Thailand is 6%**, as opposed to recommended here 3%--so if you have 6% then dilute it 50/50 with water so that you have 3%. If you don't have syringe (with NO needle) to squirt hydrogen peroxide in back of throat, then use a straw, or a piece of plastic tubing, or a camelback tube, or if have none of those things then you're going to have to tilt his head and throat back and pour it in the back of his throat. Hurry, you don't have much time until he starts showing signs that will prevent you from safely giving him the hydrogen peroxide or the activated charcoal.

Induce emesis with great caution since it could trigger seizures in an asymptomatic animal due to stress and due to the fast-acting nature of strychnine. Do not induce emesis (vomiting) in

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hyperesthetic, anesthetized, or convulsing animals. (hyperesthetic means abnormal sensitivity to stimuli such as sound, light, touch, etc)

If you have the right drugs and equipment then you can do Gastric lavage and/or Enterogastric lavage. But if you do not have these things then just focus on controlling seizures with valium or other appropriate drugs (crush tablets and give rectally if dog is seizing); making vomit with hydrogen peroxide; giving activated charcoal orally if animal is not exhibiting any neurologic abnormalities; and give ORS rectally. You may need to give a liter or more of ORS depending on the size of the animal.

Gastric lavage. **Animals receiving gastric lavage should be anesthetized and intubated** with a cuffed endotracheal tube to reduce the risk of aspiration. Tepid water at body temperature can be instilled through a gastric tube at 10 ml/kg. Use gravity to instill and to drain the liquid, and repeat until the lavage fluid becomes clear. Use large bore tubes and multiple flushes for better results.

Enterogastric lavage. Enterogastric lavage, also called a through and through, begins with gastric lavage followed by an enema under low pressure and continues until fluids exit through the gastric tube. Give a preanesthetic dose of atropine (0.02 to 0.04 mg/kg subcutaneously, intramuscularly, or intravenously) before the procedure to relax the patient's intestinal muscles and allow fluids to flow easily. **After enterogastric lavage administer activated charcoal (2 to 3 g/kg mixed with water to make a slurry) with a cathartic such as sorbitol** (70% solution at 1 to 2 ml/kg).

Seizure control

HGG Note: **they recommend pentobarbital sodium for convulsions** (see below). But it was difficult for me to buy this medicine since it is so controlled. If you have it, use it. But note they recommend below that you can use Diazepam (valium) and xylazine, both of which I could get. Diazepam ('valium') tablets/pills were sold without prescription in Thailand. The xylazine my vet med supplier would sell me (she would not sell me pentobarbital without a vet license, but maybe you can get your vet to order it for you.) The xylazine is in a bottle with rubber stopper for syringe/needle. If you can't find a vein in a hurry to give it IV, then give it SC/SQ (subcutaneously). Just pull the skin up behind the neck in a 'tent' shape and inject it under the skin. Crush the valium up in a powder, mix with some ORS 'gatorade' in a syringe and use the syringe ---with NO needle---to squirt into the mouth if animal is not convulsing or exhibiting the other signs here. But if convulsing **then squirt the crushed valium** (or other benzodiazapine like lorazepam) mixed with ORS into the rectum. **5mg per kilogram body weight. Hurry, time is short with strychnine poisoning.** Then continue giving ORS fluids into the rectum. Cool the animal with wet sponge bath and fan on high.

Remember, if the dog is seizing or convulsing or is hyper-sensitive to touch, sound, light--you will not--Must Not---put anything in their mouth. **If the animal is showing no neurological signs**, no seizing etc--**then squirt the hydrogen peroxide in the back of their throat to make them vomit before you give them Activated Charcoal.** After you make them vomit, shove as many activated charcoal capsules down their throat as you can. You won't have time to open capsules and mix it with ORS-made-with-chicken-soup so they can drink it. Forget that. Just shove the capsules down their throat using the pill-

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the-dog technique taught elsewhere in this manual. Follow the pills with some liquid (water, milk) squirted in their mouths to help them swallow pills. Many capsules. Three to six capsules per kilogram body weight. (1 gram to 2 grams per kilogram bodyweight). Once you give the activated charcoal you won't be able to give them valium orally because the charcoal will adsorb it and render it useless. So give the valium rectally unless you have an injectable drug you can use. (end of HGG note)

If convulsions are present or imminent, intravenous **pentobarbital sodium** is the **drug of choice in small animals**. It should be given to effect and repeated as often as necessary. Muscle relaxants such as methocarbamol (100 to 200 mg/kg intravenously; repeat as needed up to a maximum dose of 330 mg/kg/day) or guaifenesin (5% solution at 110 mg/kg intravenously)^{14,15} can be tried. **Diazepam (Valium) and xylazine** have been used to control strychnine seizures in dogs with **variable success**. **Propofol** (3 to 6 mg/kg intravenously or 0.1 mg/kg/min as an infusion) can also be tried. **Isoflurane** inhalation anesthesia can be used if seizures are not controlled with the preceding treatment measures.

Supportive care

Intubate severely affected animals, and provide artificial respiration. Urine acidification with ammonium chloride (100 mg/kg orally b.i.d.) may be useful for ion-trapping and urinary excretion of the alkaloid. Administer **intravenous fluids** (or homemade gatorade ORS given rectally, see elsewhere) to maintain normal kidney function and promote diuresis (urination). Monitor and correct the animal's acid-base balance as needed. (consider giving a one-time dose of baking soda orally or rectally if feasible—see elsewhere in manual for dosing details but the essence is 1/16 TEAspoon for each TWO kilograms animal weighs: 1/16 TEAspoon is a 'half-of-a-half of a ¼ Teaspoon.

Maintain the animal's body temperature within the normal range. In strychnine-poisoned dogs, hyperthermia can occur as result of severe muscle fasciculation or seizures. **Aggressive cooling, by means of ice baths** or cold water enemas, may result in hypothermia and **should be avoided**. (HG note: instead, wet the animal and point a fan at them. You DO want to cool the animal, just Not with ice baths. Get a fan going on the animal and use towels wet with cold water to get him wet. Or just pour some water all over his body with the fan on high. If no fan, just continue to pour the regular-temperature water on him. All cooling measures should be stopped when rectal temperature reaches 102 F (38.9 C) to prevent rebound hypothermia.

Keep affected animals in a dark quiet room until they have recovered. Most animals may require one to three days of treatment.

CONCLUSION

Sporadic strychnine poisoning still occurs in animals in the United States, even though human poison control data indicate a decline of 63% in strychnine exposures in people between 1995 and 2004. (**HGG note: in Thailand, strychnine poisoning is common**). Most strychnine cases in animals are reported in the West, possibly because of the region's proximity to Mexico where strychnine may be more readily

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available.

EPA guidelines restrict the use of strychnine to below-ground use. Stricter state and federal guidelines for the use and availability of strychnine may help reduce these accidental and potentially deadly poisoning cases.

Above from

- 1) Toxicology Brief: Epidemiology and management of strychnine poisoning Jun 01, 2010 By Mary Kay McLean, BS, Safdar A. Khan, DVM, MS, PhD, DABVT
- 2) petmd.com

Injecting Depo-Provera birth control hormone into female dogs and cats

A common method of birth control for female dogs and cats in Thailand and elsewhere is to inject Depo-Provera because it is cheaper than surgical sterilization. The Thais make two huge mistakes when using this method: they inject way too much and they inject way too often. The Depo-Provera (medroxyprogesterone, 'MPA'), injectable, is usually sold in 3ml (3cc) bottles in Thailand in pharmacies for human birth control. Most of these brands have 150mg in the 3ml bottle. This is enough for a 70kg human female but is WAY too much for a dog or a cat. Giving too much too often can cause a life-threatening infection caused pyometra in female dogs and cats. But some brands have an higher concentration! As much as 150mg per ml! So you have to pay close attention—read the label of the bottle. I have seen animals die a horrible death from these infections so if you are going to use this method of birth control then do it according to the guidelines below and not according to how you see the locals doing: they give way too much hormone 2) way too often and 3) they do not not change needles between animals. (See discussion elsewhere in this Manual on how to diagnose and treat pyometra).

Even if you give the correct dosage the animal can still develop pyometra so you will have to weigh the pros and cons. A Buddhist temple can have dozens of fertile female cats and dogs and it would cost a thousand dollars or more to sterilize those females using surgical sterilization, so you may feel that using Depo-Provera is a viable short-term solution. (But see discussion elsewhere in the Manual, on the web and on youtube on how male dogs and cats can be sterilized for as little as a couple of dollars using a one-time injection of calcium chloride.)

“Medroxyprogesterone (injectable birth control) For long-term reproductive control:

“CATS:

- a) 25 mg injected every 6 months to postpone estrus or*
- b) 2 mg/kg IM every 5 months*

“DOGS:

2.5 – 3 mg/kg IM every 5 months.”

(The above dosing info is from Plumb's Veterinary Drug Handbook)

I would remember it this way:

Cats 2mg/kg every 5 months, injected IM—IntraMuscularly (look on youtube for 'how to').

Dogs 3mg/kg every 5 months, injected IM—IntraMuscularly (look on youtube for 'how to inject IM in cat/dog).

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Note: ‘cc’ and ‘ml’ are interchangeable and mean the same thing because one cc equals one ml

Examples:

Cats 2mg/kg every 5 months, injected IM—IntraMuscularly (look on youtube for ‘how to’).

Cat example:

An ‘average’ **cat** weighs about 5 kilograms (kg)—or about 10 pounds. So 5kg cat x 2mg/kg needs only 10mg injected every 5 months Intra Muscularly (IM). If the bottle says ‘150mg in a 3ml’ bottle, then there is 50mg in each ml of the 3mls in the bottle. So that means that each tenth cc/ml—each 0.1--has 5mg (1/10th of 50 is 5). You are only going to inject 10mg, or 0.2ml. So you are only going to withdraw enough to rise to the 0.2ml mark. I believe you should always use a 1cc (1ml, same thing) syringe for this (and for ivermectin, too). It makes it much harder to grossly overdose an animal. A one ml (one cc, same thing) syringe is very thin, much thinner than a pencil. And it says 1ml or 1cc at the top of the markings. So the 5kg cat gets only 0.2ml. If you gave that cat a full ml then you are giving FIVE TIMES TOO MUCH! And the Thais think you have to inject every 3 months rather than five, compounding the overdose. No wonder so many female cats and dogs develop pyometra, horrible puss-filled and life-threatening infections of the uterus.

And only use your needle one time! Use a new needle each time!

Note: ‘cc’ and ‘ml’ are interchangeable and mean the same thing because one cc equals one ml

Dogs 3mg/kg every 5 months, injected IM—IntraMuscularly (look on youtube for ‘how to inject IM in cat/dog’).

Dog example:

A 10kg (22lbs) **dog** needs: 10kg x 3mg/kg is 30mg. If the bottle says ‘150mg in a 3ml’ bottle, then there is 50mg in each ml of the 3mls in the bottle. So that means that each tenth cc/ml—each 0.1--has 5mg (1/10th of 50 is 5). You are only going to inject 30mg—withdraw enough Depo-Provera to rise to 0.6 of your 1ml/cc syringe. So you are only going to withdraw enough to rise to the 0.6ml mark. I believe you should always use a 1cc (1ml, same thing) syringe for this (and for ivermectin, too). It makes it much harder to grossly overdose an animal. A one ml (one cc, same thing) syringe is very thin, much thinner than a pencil. And it says 1ml or 1cc at the top of the markings. So the 10kg dog gets 0.6ml. If you gave that dog a full ml then you are giving TOO MUCH! And the Thais think you have to inject every 3 months rather than five, compounding the overdose. No wonder so many female cats and dogs develop pyometra, horrible puss-filled and life-threatening infections of the uterus. Since you give 0.6ml to a 10kg dog then if the dog weighed 15kg you would give 50% more—inject 0.9ml. If dog is 20kg—twice the weight of the 10kg dog—then you would give 1.2ml, which is a bit more than 1ml. The 1ml syringes hold a bit more than the 1ml so just withdraw the extra. And remember, Plumb’s Veterinary Drug Manual says the dose for a dog is actually 2.5 up to 3mg/kg---so if you give 20 kg dog ‘only’ one ml you are right on target (20kg x 2.5mg/kg =50mg). Either way—a 20kg dog can get 1ml or 1.2 ml.

Pain, dental infection

It isn’t often apparent when animals are in pain, even great pain. Signs of pain can include **lethargy, depression, lack of appetite, not grooming themselves (or excessive grooming) and flinching** when you touch them. Other signs of pain include: **limping, vocalization, panting, restlessness or a change in temperament or sleep**. Dental infections are not uncommon and a sign of this is the animal flinching or growling when you touch their mouth or snout. There can often be a very putrid smell from the mouth. A toothache is not only extremely painful but the bacteria from the infection can cause life-threatening infections. You can try giving a course of an oral

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antibiotic—[clindamycin is preferable for dental infections](#)—and see if it clears the infection, but continue checking the animal for weeks afterward to make sure the infection doesn't return. (Give pain meds, too, of course). If it does not clear, or if it returns, take the animal to the vet because the vet will probably have to pull a tooth or two.

Vitamin A & Vitamin D deficiencies common in cats/dogs. Zinc & EFA deficiencies also common. Supplement using Vitamin A & D; Zinc; soybean oil.

“The main source of Vitamin A is the yellow pigment found in plants. This pigment is called carotene. When fed to dogs, carotene is easily converted by the intestinal cells into the usable Vitamin A. Not so in cats. Cats have a greatly reduced ability to convert plant pigment (Beta Carotene) to Vitamin A. Because of this, cats must be fed Vitamin A already in the liver storage form as retinyl palmitate.

“Deficiencies of Vitamin D were very prevalent in the past, but only occasionally surface today. Low levels of Vitamin D will cause a bone demineralization referred to as rickets. Again, supplementation is highly advised in both puppies and kittens and to a lesser extent in adults.

“**Vitamin D** toxicities, as with Vitamin A, are extremely rare. A dog fed Vitamin D in excess could have abnormal amounts of calcium deposited within the heart, various muscles, and other soft [tissues](#). This is rare and we have never heard of it happening in real life situations. Suffice it to say that Vitamin D plays a major role in skeletal growth, muscle control, and nerve functions. **Deficiencies are fairly common** and toxicities are rarely, if ever, present”.

<http://www.peteducation.com/article.cfm?c=2+1659+1662&aid=710>

See discussion elsewhere in the manual on the need to give supplemental Zinc to dogs & cats in poor countries, or to those with skin conditions. The skin absolutely must have zinc to heal and there is often little zinc in their diets. Also, see Manual discussion on need to give a tablespoon or two of soybean oil daily to dogs/cats (or corn oil but soybean oil is preferable. Per Merck Veterinary Manual, soybean oil provides not only healthy fat calories it supplies crucial EFAs (Essential Fatty Acids) that the skin cannot heal without. See discussion elsewhere in Manual. You may never be able to fully heal a dog with bad a skin condition using only Ivermectin and antibiotics. **Therefore, always supplement their diet with Vitamins A & D; zinc; soybean oil.**

Slow-Kill Method for Adult Heartworms

As mentioned elsewhere in this manual you can use 1 or 2 drops of Ivermectin, orally, per month to prevent heartworm. These small preventive doses kill the ‘baby’ heartworms—microfilaria. But what if you get the animal tested by your vet and your vet tells you he has adult heartworms? The regular treatment, imiticide (melarsomine) is very expensive, up to a thousand dollars in the West. And because it kills the adult heartworm fast that means pieces of the heartworms break off and possibly cause the death of the animal if those pieces get lodged in the lungs (thromboembolism).

There is another way to kill adult heartworms that is much less expensive and has fewer risks. It is called the ‘slow-kill’ method and it uses only oral doxycycline and oral Ivermectin given over a 36 week period. The Doxycycline is necessary to kill the bacteria named Wolbachia which lives inside the heartworm and helps the heartworm survive. The oral Ivermectin kills not only the circulating microfilaria but also sterilizes the adults and may harm the adults directly as well.

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You can read the article “Heartworm and Wolbachia: Therapeutic Implications” from the journal, Veterinary Parasitology, in 2008. Just find it on the web.

They were able to safely clear adult heartworms from approximately 80% of infected dogs over 9 months using Doxycycline and Ivermectin alone versus 98% (I think) kill rate using the much more expensive but dangerous arsenic-based imiticide, Melarsomine.

Note: (‘Divided doses’ means half the daily dose in the morning and half at night).

They did it using **intermittent doxycycline**, 10/mg/kg daily, in divided doses A.M/P.M, for ‘x’ weeks on (give doxycycline), ‘y’ weeks off (i.e., no doxycycline) along with a once-weekly small dose of Ivermectin every week for 36 weeks. One drop of Ivermectin is all you need to give because one drop has approximately 500mcg which is enough for even a large dog but won’t hurt a small dog.

They did as follows:

Ivermectin one time every week for 36 weeks. 6mcg/kg—I.e., the same dose of Ivermectin that is in expensive Heartgard for heartworm prevention. You can just give them a drop or two—costing pennies—of Ivermectin, orally, from your bottle of Ivermectin.

Doxycycline 10/mg/kg total daily dose, but give half of that dose in the morning and half at night. (See elsewhere in the manual on importance of following doxycycline with a squirt of water or other liquid so you make 100% certain the capsules or tablet does not get stuck in the esophagus).

Doxycycline:

6 weeks on, (daily doxycycline for 6 weeks)
 3 weeks off. (no doxycycline for 3 weeks)
 2 weeks on (etcetera)
 4 weeks off
 2 weeks on
 4 weeks off
 4 weeks on
 2 weeks off
 6 weeks on

My mnemonic is this 63 2424 42 6. The first number (6) is ON (doxycycline daily for 6 weeks), and the next number (3) is OFF (no doxycycline for 3 weeks), and it alternates ON/Off/ON/OFF like that. 63 2424 42 6

Low thyroid in dogs

Signs: **Lethargy**; **obesity**; **skin** that is **flaky**, **oily** & **thickened**; **hair** that is **scruffy**, **flaky**, & **lacks luster**; **toenails** that are **frayed** or **broken**, **thin hair** on both sides of lumbar area.

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Notice how low thyroid can produce poor skin conditions that are similar to those produced by mites, yeast, bacteria, & nutritional deficiencies. The vet below says most hypothyroidism is caused by autoimmune issues, but the dogs he treats are in the richer countries where iodine deficiency isn't an issue and where autoimmune is the rule. But in poorer countries, iodine deficiency is often common in people as well as dogs. Iodine in the diet is needed by the thyroid to make thyroid hormones and the diet of dogs in poor countries is often deficient in iodine. So before you decide to treat a dog with thyroid hormones you might consider first supplementing with iodine. You can do that by making sure the salt you are putting on their food is iodized (much of the salt in poor countries is *not* iodized.) Do your research for foods that have iodine so you can make sure your animals are getting enough of this essential nutrient. However, you may have to resort to giving the animal thyroid hormone, which is very cheap in Thailand and you can buy it without a prescription. A human who is hypothyroid often only needs one or two tablets per day, but the requirements for dogs are much, much higher. So don't be surprised if you are giving multiple tablets per day in morning and evening to a medium size dog.

Hypothyroidism info below is from <http://web-dvm.net/hypothyroidism.html> By: Roger L. Welton, DVM
 Founder, Web-DVM
 President, [Maybeck Animal Hospital](#)
 Author Canine and Feline 101

“Hypothyroidism is the most common endocrine disease of dogs. This disease is far less common in cats, however cases do occasionally occur. This article will therefore focus on dogs, but the clinical consequences similar in cats. Hypothyroidism is most commonly seen in pets four to six years of age. Male and female dogs are equally affected, however, some vets believe that neutered dogs are more susceptible than intact dogs. The thyroid gland consists of two lobes located at the base of the neck. This gland produces thyroxine, a hormone that regulates the body's metabolic rate, that is the rate at which it burns calories. When thyroxine is not produced in sufficient quantity a number of consequences may occur.

“It is common for dogs with hypothyroidism to gain weight while only eating moderately. Notwithstanding, **the majority of plump and fat dogs do not have thyroid disease** – they just eat too much and get too little exercise. Many owners are oblivious to weight gain in their pets, However, when an animal's backs become flattened instead of curved and they pant heavily with every exertion, some owners bring them in for a check up. In most cases such as these, a thyroid panel is warranted.

“Most cases of hypothyroidism stem from the dog's own immune system attacking thyroid gland tissue. This condition is called autoimmune thyroiditis, or, Hashimoto's Syndrome. Another form of hypothyroidism in dogs is idiopathic thyroid atrophy, or shrinking of thyroid gland tissue for no apparent reason. In both cases, the gland fails to produce enough of the hormone, thyroxine, and signs and treatment are the same.

“Clinical Signs Of Hypothyroidism

“Adequate levels of thyroid hormone are necessary for proper hair growth. When hormone levels are low, hair growth tends to be thin over the lumbar area equally on both sides. We call this bilaterally symmetrical alopecia, which is one of the hallmark signs of hypothyroidism. The back of the rear legs are also commonly affected. The pet's hair coat is often scurfy, flaky and lack luster. The coat is commonly deficient in finer body hairs and undercoat. The tail may be bald, like the tail of a rat. An important

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differentiating feature of thyroid deficiency is that this hair loss is not itchy as it would be from fleas, allergic or infectious skin disease. Hypothyroid dogs commonly have excess black pigment in the skin of their groin, a condition termed acanthosis nigricans. Sometimes this pigment is also present over a large part of the body and the skin becomes flaky, oily, and thickened. Also, frayed or broken toenails and are common. “Hypothyroidism often causes infertility in intact female dogs, as hypothyroidism commonly leads to erratic reproductive cycling. Pseudopregnancy or false pregnancy with milk flow and abdominal distension is common in these dogs.. Male dogs may also have low sperm levels, decreased libido, and subsequent infertility issues.

“Some other signs of sluggish thyroid function are seen occasionally and are seen with a number of diseases that are not related to the thyroid gland. These symptoms include mental dullness or depression, cold intolerance, slow heart rate, constipation, anemia, muscle weakness and atrophy, nerve disturbances, edema, stunted growth, and slowed clotting of the blood. Hypothyroid dogs have more than their fair share of joint pain and swelling and ear and skin infections. Lethargic behavior, such as increased sleeping, less play activity and exercise intolerance may also indicate thyroid disease. It has also been reported that hypothyroid dogs have a higher incidence to KCS (dry eye).

“Hypothyroidism seems to most commonly present in Labrador and Golden Retrievers, Dachshunds, Cocker Spaniels, Boxers, and Rottweilers. Hypothyroidism tends to be rare in small or giant breed dogs..

“Diagnosis of Hypothyroidism

“Diagnosis is obtained through blood test. The serum separated from the blood sample is often creamy whitish in color due to the presence of large amounts of fats (triglycerides and cholesterol) in the blood of hypothyroid patients (a condition called lipemia). The name of the thyroid panel performed on the blood sample is TSH/T3/T4/freeT4. . Low hormone levels in the absence of signs of other diseases are diagnostic of hypothyroidism. Blood levels of T-4 are normally 1.0-4.0 micrograms/deciliter. Normal levels of T-3 are 45-150 nanograms/deciliter and normal levels of Free T-4 are 11-43 picomols/liter. T-4 hovering about one unit and T-3 and Free T-4 levels are low-normal still create suspicion of hypothyroidism if clinical signs are significant. Falsely low thyroid hormone levels can be due to administration of steroids (cortisone) or concurrent systemic disease. A TSH stimulation test can be run if the diagnosis is in doubt.

“Treatment

“Fortunately, thyroid hormone is easily synthesized and available in inexpensive tablet form. The T4 form of the hormone is generally prescribed, l-thyroxine (levothyroxine sodium). The initial dose is approximately 20 micrograms (mcg) per kilogram of body weight *twice* a day. Borderline dogs are best put on thyroid hormone for a sixty-day trial. This beginning dose is in reality an estimate. All dogs need their dose individually tailored to their needs. Signs that the initial dose may be too high are agitation, excessive thirst, and diarrhea. When these occur the dose is lowered and the thyroid level rechecked. T4 is assessed 40 weeks following the beginning of treatment, or any time the dose has to be changed. Once steady state levels have been achieved, the T4 should be checked once every 6 months.”

HGG note: One tablet usually contains 100mcg of T4. Note that an adult human may be prescribed one tablet--100 micrograms, (mcg)--daily, but according to the above veterinary info, the dose for a 20 kg dog would be approximately 400 micrograms (mcg) **twice** per day, which would be 4 tablets in the morning and 4 in the evening—a dose that is 8 times more than for a heavier human taking one tablet per day. (Dogs metabolize the ingested hormone differently and therefore need much more than humans). But, even though some low thyroid dogs are never diagnosed and go untreated, **thyroid meds are among the most over-prescribed meds for dogs**, since other conditions can appear to be hypothyroid but aren't. So it is a good idea for you to have the dog tested before you start treatment. However, I have given trial doses of thyroid hormone to grossly overweight Labradors in Thailand without doing the lab test because a vet wasn't available, and because Labradors are often hypothyroid and this dog was grossly overweight but did not eat excessively. Before giving thyroid hormone you might try **supplementing** the dog's diet with **iodine (kelp in food would help)** especially since in poor countries like Thailand iodine-deficiency hypothyroidism is common in people and probably in pets, too...partly because much of the salt has not had iodine added to it, and **the thyroid gland must have iodine to make thyroid hormone**. The above vet quote re 'most hypothyroidism in dogs is caused by auto-immune' may be true in richer countries where there is less iodine deficiency. But in Thailand you can be sure that some or a lot of low thyroid in dogs is caused because they are eating a starvation diet of white rice and are therefore deficient in many important things, iodine among them. (The other things they are very often deficient in that are crucial to skin health are, as previously discussed, Vitamin A, Zine, EFAs from soybean or corn oil; and perhaps iron). However, **don't overdo the kelp supplementation**, since it can supply too much iodine **but note that it is rare to cause thyrotoxicosis through kelp supplementation:** *"Iodine-induced thyrotoxicosis after consumption of kelp or kelp-containing dietary supplements is rare,"* from an article that described a human patient who did in fact ingest too much. The article is titled 'Iodine-Induced Thyrotoxicosis After Ingestion of Kelp-Containing Tea', by Karsten Müssig, MD et al in the Journal of General Internal Medicine, June 2006.

Leptospirosis: from water contaminated with urine; infects dogs and humans
Doxycycline for ticks also treats for Leptospirosis

Below is info on Leptospirosis which is more prevalent in poor countries with large stray animal populations because Leptospirosis is spread by contact with water contaminated with infected urine. And it is a **zoonotic** disease, meaning it can be **transmitted from animal to human**, i.e. **you can get it, too**. Note that the drug—doxycycline—that you will be routinely be giving to most or all of your dog patients for their suspected tick-borne infections, is the same drug that will treat Leptospirosis. Because you are giving Doxycycline for tick diseases for 3-4 weeks, you will also be treating them for Leptospirosis since the time period to treat for Leptospirosis is only 2 weeks. Note, however, that just because you treat for tick illnesses and Leptospirosis 'today' doesn't mean they can't develop either or both of those in the future. So you very well may be giving another course of doxycycline in the future.

Dogs in poor countries could have---or is even likely to have---acquired either tick illness or Leptospirosis, or both. Because 2 weeks of doxycycline will treat Leptospirosis but it requires 3-4 weeks of doxycycline to treat tick illnesses, then I would opt to give at least 3 weeks of daily

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doxycycline to any dog exhibiting symptoms of Leptospirosis or tick illnesses. 3-4 weeks will cover both of those, but 2 weeks worth of doxycycline will only be enough to treat Leptospirosis. Takeaway: give 3-4 weeks of daily doxycycline to treat the dog even if you suspect he ‘only’ has Leptospirosis.

So read the info below and learn the symptoms of Leptospirosis, and note that there is some overlap of those symptoms with symptoms of tick illnesses. Working far from vets and without money for expensive testing, I won’t hesitate to give 3 weeks of doxycycline to any dog exhibiting any of the symptoms of Lyme and other tick illnesses or symptoms of Leptospirosis. In fact, you can argue that it is a good idea to give a course of doxycycline to all dogs (but not puppies) you care if you are living in a country where you see many ticks on the dogs. Remember, even just one tick can cause serious illness in a dog, just as one tick can cause Lyme disease in a person. **Any dog I remove many ticks from I never hesitate to give 4 weeks of doxycycline to.** It is probably a good idea to give 3-4 weeks of doxycycline to *any* dog you find with *any* number of ticks on it, especially considering that **tick pathogens are much more easily killed in the early stages of infection** than later when they have ‘burrowed’ deep into the body. This is why doctors in the USA will automatically give a course of doxycycline (or other appropriate drug) to any patient who has the Lyme trademark (on humans): the **red ‘bulls eye’ rash.**

(from the Merck Veterinary Manual):

“Leptospirosis is a disease caused by bacteria in the genus Leptospira; there are roughly 17 species. Because the organisms survive in surface waters (such as swamps, streams, and rivers) for extended periods, the disease is often waterborne.

“Dogs contract leptospirosis by direct contact with infected urine or contaminated water sources, through bite wounds, by eating infected tissue, or exposure during birth. Once in the body, leptospire spread rapidly via the lymph system to the bloodstream and then to all tissues. If the animal mounts an immune response and survives, leptospire will be cleared from most organs and the bloodstream. However, the infection persists in sites hidden from the immune system; the most common hidden site is the kidneys. Persistence in the kidneys results in a carrier state; the infected animal may shed leptospire in the urine for at least a year.

“Infections may be without signs or cause various early signs, including fever, jaundice, joint or muscle pain, loss of appetite, weakness, and discharge from the nose or eyes. This may progress within a few days to a kidney crisis characterized by loss of appetite, vomiting, dehydration, and lumbar pain from inflammation of the kidneys. Sudden kidney failure occurs in 80 to 90% of dogs that are severely affected. In dogs that develop milder forms of kidney failure, excessive intake of water followed by excessive urination may be the primary sign.

“Leptospire invade the body after penetrating exposed mucous membranes or damaged skin.

“Acute kidney injury has been the most common presentation for canine leptospirosis in recent years. Affected dogs may present with lethargy, anorexia, vomiting, abdominal pain, and history of polyuria (frequent urination), oliguria (infrequent urination), or anuria (not urinating).

“Muscle pain, stiffness, weakness, trembling, or reluctance to move can be seen in dogs with leptospirosis. Less common manifestations of canine leptospirosis include bleeding disorders characterized by petechial hemorrhages, epistaxis, melena, and hematemesis.

“Because leptospirosis is a zoonotic disease (can be transmitted to humans), all veterinary personnel should take appropriate precautions when handling known or suspected infected animals. Such dogs do not need to be

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placed in isolation but should be nursed with barrier precautions, paying particular attention to avoiding exposure of skin or mucous membranes to urine or blood. Infected dogs should be allowed to urinate in designated areas that can subsequently be cleaned and disinfected. The organisms are killed by all commonly used disinfectants. Owners of dogs recently diagnosed with leptospirosis should be advised of the zoonotic nature of the disease and contact their physicians with any health concerns. Owners should wear gloves when cleaning up urine and should wash their hands after handling the dog, at least until the course of antibiotic therapy is completed.

Signs of Leptospirosis in Dogs

Early findings are nonspecific and include:

- *Fever*
- *Depression*
- *Lethargy*
- *Loss of appetite*
- *Joint or muscle pain*
- *Eye and nasal discharge*

The disease may progress within a few days to a kidney crisis characterized by:

- *Vomiting*
- *Dehydration*
- *Lumbar pain from inflammation of the kidney*
- *Kidney failure*

(above from the Merck Veterinary Manual)

Lyme Disease in Humans—topically ‘bomb the bulls eye rash’

I never found a tick on me while in Thailand, I suppose because there were so many dogs to feast on that the ticks didn't bother with humans there. It is a different story in the United States, with over 300,000 new cases of Lyme disease diagnosed each year in people in the USA. So it makes sense to have good vigilance when you are around ticks, no matter where they are. When I found the red bulls eye rash on me one day living near Washington DC, I knew I had been bitten by a Lyme tick. I started taking Doxycycline orally immediately. I now know that when starting doxycycline it is a good idea for three days to take double the recommended dose because this quickly builds the doxycycline blood levels higher, faster. *“Without a loading regimen, optimal concentrations of doxycycline are achieved after 4–5 half-lives (i.e., ~5 days into therapy). This has led some physicians to conclude that doxycycline has failed early in the course of treatment, not appreciating that administration of the usual 100-mg intravenous or oral dose, without a loading regimen, results in suboptimal concentrations during the first 5 days of treatment.”* (Burke A. Cunha *Clin Infect Dis* (2003) 37 (6): 870.)

Upon further reading I also learned that the Lyme bacteria are actually ‘massed for attack’ at the rash site (and are probably moving out in the bulls eye concentric pattern). So I thought why not sprinkle doxycycline directly on my skin on the rash and then coat it with liquid DMSO, which is an amazing compound that has many therapeutic effects but one of its most startling is it is an incredible solvent. It is so powerful that when applied to human skin it can soon be found distributed throughout the body. So I did this, and continued doing this

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'bomb from above with DMSO/doxycycline' in addition to the oral doxycycline I was eating daily until the rash disappeared at which point I stopped to topical and continued the oral.

I thought I may have discovered something interesting---if 'my' ideas were correct. I did a search of the literature to see if anyone else had done this and sure enough: there was a paper by an MD who used the topical combination of Azithromycin with alcohol because Azithromycin has better skin penetration than doxycycline. (Journal of Antimicrobial Chemotherapy, Volume 66, Issue 12, 1 December 2011, Pages 2814–2822, <https://doi.org/10.1093/jac/dkr371>) That 2011 paper cites a 1993 article that used Doxycycline with DMSO to good effect but the 2011 author claims the 1993 paper warned of the 'dangers' of DMSO. But I read the 1993 article and it says no such thing. (Shih CM, Spielman A. Topical prophylaxis for Lyme disease after tick bite in a rodent model. J Infect Dis 1993; 168: 1042–5.) It merely says *"Although this carrier solvent was included in these experiments to facilitate penetration by topically applied candidate antibiotic preparations, the need for such a formulation has not been established. Ethanol preparations, for example, may be as effective as those based on DMSO."*

Based on what I know now, **if I were bitten again by a Lyme tick,I would use [Doxycycline orally](#)** of course. **And I would [intermittent oral metronidazole](#)** to kill the cyst form of Lyme, as the spirochete form killed by doxycycline can morph into the cyst form to protect itself. But metronidazole can have adverse effects so only use metronidazole under a doctor's supervision on a human or a dog. Taking oral doxycycline for a red bulls eye rash, however, is a no-brainer and adverse effects are rare. And, if I still had the bulls eye rash, I would use **both topical protocols: [topical Azithromycin plus ethanol](#)**; and **[topical doxycycline plus DMSO](#)**---directly on the bulls-eye rash.

The US Centers for Disease Control (CDC) says "(in people) ***the number of (new cases) diagnosed with Lyme disease each year in the United States is around 300,000.***"

So you can see that ticks are a huge problem for humans, too. And these Lyme infections are the result of ONE TICK bite per infected person. Pity our dog friends with dozens of ticks hanging on them at any one time.

So here's hoping if you are one of those cases that you are one of the 'lucky' ones who finds the bulls eye rash--most don't--because if you find that rash on you then you are in a superior position to kill those spirochetes (syphilis is a spirochete) before they can burrow deep into your body.

Perhaps you can see why our dog friends, especially in poor countries, can suffer from ticks because it takes only one tick to convey powerful pathogens. Yet these dogs can have a dozen ticks at one time, which fall off after feeding, only to be replaced by a dozen more. And ticks can inject many different organisms: many doctors are finding more than one tick-borne pathogen in both animal and human patients. And since the Merck Vet Manual, among other books, recommends treating without waiting for the results of tests, I 'automatically' treat most dogs I am caring for with 3-4 weeks of daily doxycycline.

Distemper and Parvo

<http://www.pet-informed-veterinary-advice-online.com/canine-distemper.html>

The above link and website is excellent. I highly recommend you read the above link to learn how to prevent distemper and parvo (vaccination is important) and how to diagnose and treat them.

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Because both Parvo and Distemper are viral diseases there are no medicines to kill the virus when the dog gets either. Supportive care is the cornerstone of therapy, especially fluids which, if you've read this manual, you know fluids means saline IV, or, if you have no IV, or even in addition to IV administration—you give Oral Rehydration Solution (ORS) given orally or rectally. (ORS is basically homemade Gatorade—see directions elsewhere in this manual).

Even though there are no 'regular' drugs which fight the distemper virus, there are reports of using Intravenous Vitamin C to cure active distemper. And there are reports of using diethyl ether inhalation to kill the virus while it is active in the bloodstream. Since you probably won't have access to diethyl ether you will want to try IV Vitamin C, especially since there is no danger in doing so. In Thailand, from vet supply companies, you can buy IV Vitamin C quite cheaply.

Before you dismiss this idea, you will want to read the papers whose links are below. One of the hottest topics in Emergency Medicine for humans is using **IV Vitamin C, Vitamin B1 (thiamine) and hydrocortisone to save the lives of patients with sepsis**. Hydrocortisone is the pharmacy version of cortisol, a major hormone made by the adrenal glands and which can get dangerously depleted under conditions of severe stress such as illness, shock or an accident. If you can't get hydroCORTISONE you can use prednisolone or dexamethasone; for some reason in Thailand you can buy those two but not hydrocortisone. (note: hydroCORTISONE is not hydroCODONE).

Sepsis is overwhelming infection of the body that conventional treatments have a poor record of treating. If you get sepsis while in the hospital (or come in with it) your chances of survival are not that great---at least until doctors started using high doses of IV Vitamin C, thiamine and hydrocortisone. The effectiveness of this treatment has shocked the medical profession. Further use and study will prove or disprove it. But this most recent proponent is a doctor who has a great deal of experience treating septic patients and he has seen many or most die, as do all other doctors with septic patients. So when he tried IV Vitamin C and witnessed quick recovery in profoundly septic and dying patients...well, it didn't take much to convince him that it worked.

The mechanism is something modern medicine is only recently beginning to understand. That is, harm and death from pathogens is not caused so much by the pathogens themselves as it is by the immune system of the body attacking the invaders and causing tremendous 'bystander damage'...that is, tremendous damage to healthy tissue and depletion of nutrients. Think of it as the Navy Seals (immune system) crashing into a building full of mostly innocents so that the Seals can kill a handful of terrorists: innocents are also going to die with so much fighting going on. And this is what happens in the body in disease, as well as in chronic conditions such as arthritis and other auto-immune disease; and even cancer: a lot of collateral damage.

So when you understand this process, called 'inflammation', you can appreciate how antioxidants such as Vitamin C can have a profound influence in calming the collateral damage. Inflammation means the result of the body's immune system attacking targets with all sorts of warriors including: antibodies, macrophages, lysosomes (chemical warfare vesicles), Natural Killer cells, CD4 helper cells, leukotrienes, lymphokines, cytokines, hydrogen peroxide, bleach (yes, our cells make bleach and hydrogen peroxide), super oxide, and last but not least, the almighty hydroxyl radical. The body has an amazing arsenal of weapons and these weapons can cut both ways: helping us and also harming us especially if critical nutrients become depleted.

And as you will see when you read the article mentioned below, Vitamin C becomes depleted during sepsis. And so does Vitamin B1 (Thiamine), the same vitamin that when alcoholics lack it they get the irreversible brain damage known as Korsakoff Psychosis. There is a reason for that depletion: the body, in fighting sepsis, is using

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tremendous quantities of Vitamin C and Thiamine in energy production and to neutralize and perhaps even to simultaneously fuel the 1) cytokine storm and the immense generation of free radicals that are needed to kill invaders but which can also harm if not balanced by antioxidants. [The body is the supreme fighter and our medicines and protocols 'only' help the body do its job.](#) Even antibiotics work this way, for the body is already fighting the infection by the time we give antibiotics and those antibiotics give the body an essential boost. If there weren't a functioning immune system the chance of the antibiotics by themselves killing the invaders would be next to nil. So, in this context, it makes perfect sense that giving essential nutrients like Vitamin C, Vitamin B1 (thiamine); and hydrocortisone (cortisol) to a septic patient can help save their lives.

Reading articles by Dr Farkas at the following website you will also come to appreciate that should you ever have a dog with septic shock that dog will need fluids but NOT the super-aggressive fluids we give to patients with diarrheal & vomiting illnesses such as Parvo and Distemper. The old guidelines for septic shock were indeed to give large amounts of fluids fast, but new evidence is demonstrating this is causing increased mortality in septic patients. This is because in septic shock there is profound dilation of the blood vessels causing tremendous leakage of fluids out of the vessels, thereby causing death. In the words of Dr Farkas: ***"the evidence is clear: a protocol of aggressive fluid administration kills septic patients by 'salt water drowning'"*** <https://emcrit.org/isepsis/isepsis-death-fluids-part-1/>

Below is one of his articles on the amazing Vitamin C given IV saving septic patients.

"Metabolic sepsis resuscitation: the evidence behind Vitamin C" March 27, 2017 by Josh Farkas, MD in the medical journal PulmCrit <https://emcrit.org/pulmcrit/metabolic-sepsis-resuscitation/>

And here is veterinarian Dr Belfield's article from the 1967 demonstrating his remarkable cure rate on Distemper dogs using IV Vitamin C. Looks like Dr Belfield, DVM was ahead of the curve. "Vitamin C in Treatment of Canine and Feline Distemper Complex" by Wendell O Belfield, DVM" <http://belfield.com/pdfs/VitaminC.pdf>

So the takeaway from this is: if you have a dog with either Parvo or Distemper, you have nothing to lose by giving IV Vitamin C, Vitamin B1 (thiamine) and hydroCORTISONE (or prednisolone or dexamethasone). If you don't have IV equipment, then I suggest using oral forms and you can also administer those things rectally after you crush them to powder and put the powder in some ORS and squirt it into the rectum with a plastic syringe with no needle. If you use plain water the rectum may very well expel that water. But if you use Oral Rehydration Solution (ORS)—'homemade Gatorade'—it will not be expelled. To be on the safe side, do not super-aggressively administer fluids; you must, however, replace what has been lost and what continues to be lost through vomiting and/or diarrhea.

Canine Vaccines & Vaccination Schedules

Below info from: <http://www.natural-dog-health-remedies.com/canine-vaccines.html#core>

One of the vet authors commented elsewhere re the below: *I'm encouraged by, if not blissful about the new guidelines. The absolute highlight is that all core vaccines with the exception of the 1-year rabies are now recommended at 3-year or greater intervals. Even more exciting is the task force has acknowledged that in the case of the non-rabies core vaccines, immunity lasts at least 5 years for distemper and parvo, and at least 7 years for adenovirus.*

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What are Core and Noncore Vaccines?

The American Animal Hospital Association (AAHA) released a set of guidelines in 2003 (and revised in 2006 and 2011) regarding canine vaccines and vaccination.

In the revised guidelines, the AAHA classified canine vaccines into *core* and *noncore (optional)*.

According to AAHA, core vaccines are those that all dogs should receive in order to protect against diseases that are more serious or potentially fatal. These diseases are found in all areas of North America and are more easily transmitted than noncore diseases. The AAHA guidelines define the following as **core vaccines**: [distemper](#), [adenovirus](#), [parvovirus](#), and **rabies** (1-year vaccine or 3-year vaccine).

Noncore vaccines should be given selectively, depending on a dog's particular geographic and lifestyle exposure. According to the AAHA guidelines, canine vaccines for *Bordetella*, *Canine Parainfluenza*, *Canine Adenovirus (Intranasal)*, *Canine Coronavirus*, *Canine Influenza*, *Lyme disease*, and *Leptospirosis* are noncore vaccines.

Can Canine Vaccines Prevent Diseases?

Before answering this question, we need to understand that there are two types of disease - acute and chronic.

Acute diseases are generated by an infectious organism - **the infection itself creates the illness**. Examples of acute diseases are canine distemper, canine hepatitis, rabies, and canine parvovirus.

Chronic diseases, on the other hand, are usually caused by immune system malfunctioning which can be either immune system overactivity or immunodeficiency.

In the case of immune system overactivity, the immune system attacks the dog's own body systems because it has problems distinguishing between host and foreign tissue. Chronic diseases resulting from an overactive immune system are called [autoimmune diseases](#).

Chronic diseases can also be caused by immunodeficiency. Although very often, immunodeficiency diseases seem like acute diseases since an organism may be associated with these diseases, in most cases the organism is NOT the cause. The root cause of immunodeficiency diseases is a weakened immune system and the organism may just be a trigger that brings on an infection. In other words, **illness precedes the infection**. Examples of immunodeficiency diseases are kennel cough complex and Lyme disease.

Returning to the question ... Canine vaccines can only potentially prevent acute diseases but not chronic diseases. As mentioned above, acute diseases are truly caused by an infectious organism, therefore vaccination can help prevent a dog from getting infected by stimulating the dog's immunity to produce

antibodies to fight against the organism. Even so, bear in mind that vaccines are not 100 percent effective for acute disease prevention.

For chronic diseases, vaccination simply does not work as the true underlying cause is NOT the infectious organism. Only by addressing the underlying cause (i.e. strengthening or regulating the immune system) can chronic diseases be cured/prevented.

Can Canine Vaccines Cause Diseases?

Vaccinations put a lot of stress on a dog's immune system. More and more holistic veterinarians have reached the conclusion that vaccinations can not only cause immediate side effects and allergic reactions, but they also contribute to a lot of long term chronic health problems, including skin allergies, arthritis, thyroid disease, recurrent ear and respiratory infections, inflammatory bowel disease, liver and kidney diseases.

For example, rabies vaccines can cause such typical adverse reactions as fever, stiffness, sore joints and abdominal tenderness. The vaccines can also cause the dog to be susceptible to seizures, infections, neurological disorders, and liver or kidney failure may also occur.

It has also been [established](#) that the rabies vaccine can cause cancer at the site of injection (vaccine particles have been found within the cancer mass in a number of cases) and many veterinarians now refer to this type of cancers as **vaccine-site sarcomas**.

In addition, according to [this 2002 study](#), rabies vaccines may cause dogs to develop hypothyroidism.

A Low-Risk Way to Vaccinate Your Dog

As canine vaccines can potentially cause a lot of health problems, you may wonder if it is absolutely necessary to vaccinate your dog, and if so, what is the safest approach.

Dr. Hamilton, a holistic veterinarian and author of *Homeopathic Care for Cats and Dogs*, suggests that we should only vaccinate our dogs against diseases that meet all of the following criteria:

1. The disease is serious, even life threatening.
2. The dog is or will be exposed to the disease.
3. The vaccine for the disease is known to be effective.
4. The vaccine for the disease is safe.

Also, many holistic vets (e.g. Dr. Hamilton and Dr. Pitcairn) stress the importance of using single or simple vaccines instead of the combination vaccines which have become very common these days. This means **vaccinating for one disease at a time**. Dr. Hamilton rightly points out that natural exposure to diseases is usually one at a time, and so the body is more successful at responding to one vaccine at a time and producing immunity without adverse effects.

Where possible, use only "killed" or "inactivated" vaccines as opposed to "modified live" since "killed" vaccines cannot grow in the body and therefore are safer to use.

It can be difficult to find a vet who has single vaccines readily available. It is also possible that some non-core vaccines are included and given together with some core vaccines. Therefore, it is important to double-check with your vet and make sure that none of the non-core vaccines are included in the core vaccines that are to be given to your dog.

You may have more luck to get single vaccines if you seek help from a holistic veterinarian.

When Not to Vaccinate Your Dog

As vaccinations put a lot of stress on your dog's immune system, vaccinations should NOT be given to the following dogs:

- **Too Young Puppies:** Vaccinating young puppies too early and too often can prevent vaccines from having the desired effect. One reason is that young puppies (4-9 week-old nursing puppies) get maternal antibodies from their mother's milk. The antibodies identify the vaccines as foreign infectious agents and destroy them. Also, vaccinations that are given too closely spaced interfere with a puppy's immune system response because immune components from the earlier vaccine nullify the following one. To prevent this from happening, the interval between the first vaccine and the next booster shot should be 3-4 weeks.
- **Stressed Dogs:** Dogs who are stressed have weakened immune systems and should not be vaccinated. So, for example, if you are moving to a new house or taking your dog on a plane, do not vaccinate the dog during these stressful periods. If you have just adopted a new puppy, keep him at home for a week or so and let him get used to his new environment before getting him vaccinated.
- **Dogs on Certain Medications:** Some medications suppress the immune system and dogs who are on such medications should not be vaccinated. Steroids (e.g. prednisone, prednisolone) are one such med that significantly suppress the immune system (a short bout of steroids can reduce immune function for over 75%.)
- **Dogs with Cancer or other Serious Illness:** Dogs diagnosed with cancer (even those in remission) should not be vaccinated. Ditto for dogs with other chronic illnesses such as liver or kidney problems, chronic infections, immune dysfunction problems, seizure disorder, etc. Dogs predisposed with illnesses may be more prone to experience adverse reactions to vaccines.
- **Pregnant Dogs:** Vaccinating pregnant dogs can result in birth defects or abortions. Pups may also develop vaccinosis problems later on in life.

Dr. D. Schultz, an expert in the field of veterinary vaccines, and a professor and Chair of the Department of Pathobiological Sciences at the School of Veterinary Medicine, University of Wisconsin, suggests that vaccination should be avoided 30 days before and during estrus, pregnancy, and lactation.

Which Canine Vaccines are Absolutely Necessary?

As mentioned above, the AAHA guidelines define **distemper**, **adenovirus**, **parvovirus**, and **rabies** as core vaccines. Most holistic veterinarians, however, believe that the absolutely essential vaccines are

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distemper and **parvovirus**. Rabies vaccination poses a lot of health risks on a dog; however, it is required by law and we do not have too much of a choice.

Are Yearly "Booster Shots" Necessary?

Vaccinations do not magically lose their effectiveness 366 days after the last shot. In fact, previous studies have shown that the vaccines for parvovirus and canine distemper provide extremely good, long-term protection from the diseases for 8 to 10 years or more.

"Booster shots" do not increase a dog's immunity, nor do they assure that the dog is protected. However, these booster shots do increase the risk of adverse reactions.

There are no benefits and many risks to re-vaccinating for a disease your dog is already immune to.

The good news is, the American Animal Hospital Association (AAHA) Canine Vaccination Taskforce, in their 2011 revised guidelines, finally acknowledges that yearly re-vaccinations are not necessary.

Specifically, the Taskforce has done studies to confirm that, in case of core canine vaccines, *immunity lasts much longer than one year. It has been found that for distemper and parvovirus, immunity lasts for at least 5 years; whereas for adenovirus, at least 7 years.*

The Taskforce therefore advises that dogs can be *re-vaccinated at 3-year or greater intervals* for all core vaccines (except the 1-year rabies vaccine).

Instead of automatically giving booster shots to your dog, insist on getting **titers** first. (A titer is a blood test that can show if your dog's antibody levels for parvovirus or canine distemper remain high enough to resist infection).

As regards rabies shots, [a study](#) is currently being done by Dr. Schultz. The study is to try to determine the duration of immunity conveyed by rabies vaccines. It is Dr. Schultz's goal to find conclusive evidence that immunity duration of rabies shots is longer than the current limit, so that state and local laws can be changed to extend the required interval for rabies boosters to 5 and then to 7 years.

Safe Puppy Vaccination Schedules

An example of a safe puppy vaccination schedule as suggested by Dr. Pitcairn is as follows:

- From 0 week to 22 weeks - keep the puppy isolated from other dogs
- First **distemper** - 16 weeks
- First **parvo** - 20 weeks
- Second **distemper** - 24 weeks
- Second **parvo** - 28 weeks
- **Rabies** - 32 weeks

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Another minimum vaccination protocol is recommended by Dr. Schultz - which is just one DAP (Distemper/Adenovirus/Parvo) at 15 to 16 weeks, followed by a simple blood titer test 2-3 weeks later, with the rabies vaccine given at about 20 weeks of age.

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