

## **Inquiry – Ethylene Glycol toxicity Diagnosis and Treatment**

I have been working with the local animal hospital that supports us in updating the contents of the cache.

The issue that has come up is regarding the medication 4-methylprazole for Ethylene Glycol poisoning. The animal hospital has been very generous about holding meds in our K9 medical cache for deployment and pulling them for the hospital use prior to expiration which results in no cost to our TF. However the 4-methylprazole is a medication that they don't often use and are therefore unwilling to bear the cost. They have offered to purchase it at a cost of ~ \$400 and they advised that the shelf life is only 1 year. They advised our Program Manager that an acceptable alternative is using drinking alcohol, specifically vodka administered intravenously. They said they would prepare a dosage schedule for us. I have done some research and I have found that this practice is not uncommon. I was hoping that you might share your thought on this. I'm fine if the vodka antidote is acceptable. I just want to insure that our K9's aren't neglected due to a cost measure. Thoughts? Do you know if the veterinarian who deploys to the IST might carry this medication for us?

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## **USAR Vet Group – Individual Responses**

So whenever faced with a question of a high cost treatment for a low probability but high risk event - you have to weigh those risks versus alternatives. Without a doubt untreated ethylene glycol intoxication will kill a dog. I have treated ethylene glycol intoxication with both 4MP and vodka and hands down 4MP is the way to go from the management standpoint. I think I would argue for 4MP but with the following considerations -

Any use of vodka should be done in a full service veterinary hospital and preferably not in the field - those dogs can be really challenging to manage (mean drunks some of them).

Do you also carry the ethylene glycol test kit? If you can't confirm the diagnosis then you shouldn't start treatment. Without the kit there are key changes in the blood values and urine (most caches have an I-stat so you might be able to reach a high level of suspicion) along with behavioral changes that might be enough to initiate treatment (but this decision is best made by a veterinarian)

Isn't our aim to stabilize patients and get them transported to definitive care as soon as possible - if that is indeed the case it makes the probability of needing the 4MP or vodka for that matter in the field even lower -most e-clinics will have access to 4MP or if not then they will be able to utilize vodka - this is not something I would expect any of our medics to manage and even if we get vets deployed in the field with the teams it might only mean the first dose and then transport.

So I have successfully avoided giving you a definitive answer . . .but am happy to continue the conversation based on what you and the other vets in our group have to say - In an ideal world yes 4MP - in the real world - have your support services lined up and make sure the local e-clinics have access - that gets really complicated if you are working internationally -but in this

country it can likely be managed. I just looked at the VMAT list of drugs and we do not have 4MP on it . ... Dr. Otto

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Regarding Antizol: we've also had the problem that Antizol is one of two medications on the cache list that I haven't been able to rotate through my hospital inventory (the other is apomorphine tabs, because we use injectable), so the TF has to eat the cost when it expires. The current bottle in our cache will be expiring in June. But my opinion is that Antizol is still justified to have in the cache because when you need it, you need it \*now\*.

Third, Cindy brought up the ethylene glycol test kits. I don't have it currently in our cache because I talked to a toxicologist who said that Antizol is safe to initiate even if you only have strong suspicion of EG ingestion and not lab confirmation. Thoughts?

Dr. Madsen

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We stock it and I try to rotate it through our inventory since we do use it in our ER more frequently than our day practice. On the last cache update the team purchased it as there is now a human equivalent.

I have used the alcohol before the 4-mp was available, thought we used the grain alcohol instead of the vodka. It's a very nasty treatment and I agree with Cindy, not nearly as effective. She makes a valid point - how are you going to diagnose an eg toxicity in the field without the proper lab equipment. No matter what treatment you use, if the dog drinks enough it is not going to survive. In my experience the renal values take over 24 hours to change and by then treatment is usually too late to be of benefit. Earliest detectable changes occur in the urine with a ton of crystals being produced (we often see the "hippuric acid" form of the crystals) but then again you need a centrifuge and a microscope. The in house eg test kits are somewhat tricky to use and only are useful within the first 24 hours. I also agree with Cindy that immediate evacuation to a treatment center would be the primary goal. However, because this is such a potent toxin and early treatment is so vitally important I would vote to keep it in the cache. I think the veterinarian available (and hopefully there will be a veterinarian available??!!) needs to be aware of the acute external symptoms and immediately start treatment if those symptoms are present. The second dose of 4-MP is given 12 hours after the first. so hopefully the dog would be evacuated by then. I can think of two instances where immediate evacuation would have been difficult - Katrina and Haiti. Obviously, if the handler or other team members have seen the dog drink the eg then diagnosis is a no brainer. Normally I see a dog that appears to be staggering and drunk, often hypothermic and if still able to walk will have a tremendous thirst. They will drink from a bowl even if they are unable to stand. Pain over the kidneys may also be present. My two cents worth- let's keep it.

Best Regards, Dr. Honaker

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I agree with the points so far. I think probably the most important argument you will face is:

\$400 x (# of caches) = cost per year of this alone analyzed with "cost of trained canine" and possibly "number of previous search canines which were affected". Don't get me wrong, I would like it in the cache. I would just consider answers to the above and be prepared as to how to respond. If money is a mute point then it won't be a problem. Just trying to figure all the angles they might take. Scott Mason

My only thought is .....it would be nice to have the kit....even if the antidote is safe when you make the decision to treat you will possibly be sidelining a dog unnecessarily....if you deploy with only four dogs you will be down to three....putting an extra burden on those remaining three and creating a huge amount of stress for all involved if you don't have an accurate diagnosis... Just my two cents as a handler.....Dr. Merrill