

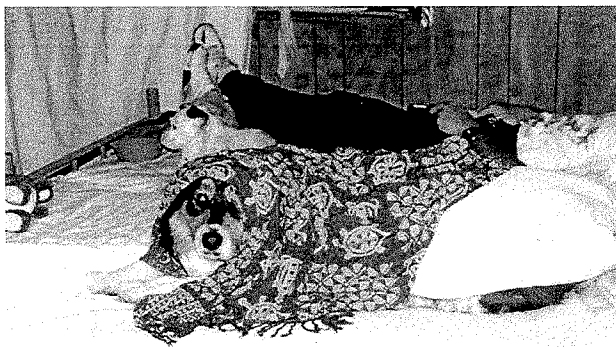
PROTOCOL FOR UNDERSTANDING AND TREATING DOGS WITH NOISE AND STORM PHOBIAS

Overview of the Problem

Noise and storm/thunderstorm phobias are relatively common in dogs and may vary in commonness and intensity based on geographic location and frequency and severity of the noises. Not all reactions to storms are the same—some involve avoidance behaviors, some involve fear, and some involve outright panic. Not all noises are perceived to be the same to dogs. Some dogs can tolerate fireworks, but not storms or gunfire. Some dogs can tolerate gunfire, but not city noise, backfires of cars, or noises made by plastic bags or metal trash cans. Some noise-phobic dogs flee at the crackle of a fireplace or the alarm on a refrigerator or clothes dryer. It is extremely helpful to ensure that you know all the noises to which your dog reacts and that you share this list with your veterinarian.

If you are not sure what noises upset your dog, watch carefully. Videoing the dog in a number of environments and when you are not home will also help. Knowing whether dogs react to noise and to which noises they react is essential for the dog's well-being. Research shows that noise reactions often co-occur with other anxiety-related disorders that would otherwise not have been diagnosed. A tendency to react to noise may predispose dogs to other conditions. There is some evidence that the genes associated with noise reactivity in dogs appear to affect how dogs process information so early intervention is the humane solution.

The key to treating these types of phobic reactions is to address them early in their ontogeny or development. **Left untreated, these types of problems—virtually without exception—become worse.** We now know that there are inherited forms of noise reactivity and phobias, and that herding dogs are often affected. If you know that at least one parent reacted to storms and, or other noises, expect the chances that the pup will react to be great, and look for early signs that may put the pup at risk. The same tools we use to treat noise reactivity and noise phobia can help prevent it from developing further if caught early in a dog with a known familial risk.



This Australian shepherd has been treated with a benzodiazepine, so she can hide and rest under a sheet rather than endlessly pace.



This Australian shepherd differs from the one below, who paces during storms. Instead, this dog freezes and tries to escape lightning.



This border collie hides in his crate, but is still completely panicked. (Photo courtesy of Melanie Chang.)

Noise Reactivity and Its Association with Other Anxiety-Related Conditions

Data indicate that if a dog has storm or noise phobia he may be more at risk for the development of separation anxiety, generalized anxiety disorder, panic disorder and, possibly, other anxiety-related conditions. The signs of noise phobia and separation anxiety can be the same: trembling, salivation, defecation, urination, destruction, escape, panting, vocalization, pupil dilation, cringing, et cetera. Not all dogs exhibit all signs, and not all dogs exhibit their signs with equal intensity. Some signs cluster together more frequently than others, although the neurochemical significance of this is currently unknown. We **do** know that the more signs the animal

exhibits, and the longer the phobia has been ongoing, or the more profound the dog's reaction, the worse the case.

This handout discusses treatment for noise and storm phobias. Because of the commonness of these conditions, and the general lack of information available, this handout is more technical than most other handouts and contains information that clients can best use in consultation with their veterinarian.

Behavioral Approaches to Treatment

Treatment focuses on altering the dog's response to the stimuli by teaching the dog the competing behavior of relaxing. This part of the behavior modification requires that the dog is not inadvertently rewarded for his fearful or anxious response. For example, even if the dog is cringing under the bed and panting, *clients should not tell the dog that it is "okay," and they should not pet the dog.*

- First, it is not "okay," and the dog knows it. Most dogs associate the word "okay" with a behavior that is encouraged and rewarded. Telling them it is "okay" when it is not will confuse the dog and leave her without a clear road map of what is expected. As a result, the dog could become more anxious, although this is clearly an unintended consequence.
- Petting the dog can act in the same way as telling the dog that it is "okay." Petting is a reward; unfortunately, what is being rewarded is the anxious behavior. This is not what the client intends, but it can be what the dog learns. We also have to consider the possibility that for some dogs the petting is just one more stimulus that adds to an overly "noisy," stimulating, mental environment that will make the dog unhappier and worse.

So what can someone who wishes to help the dog do? *Watch the dog and learn what behaviors of yours, if any, calms the dog.*

- Try either leaving the dog alone in a space that is as calm and quiet as possible, if she is not at risk for injury, or just stay quietly by the dog. Quiet association can provide solace and security without accidentally rewarding the dog.
- And instead of petting the dog, just put *gentle continuous pressure*, either with an arm or the whole body, on the dog. This pressure works in most mammals to calm general arousal. If permitted by the dog, you can lean on or against the dog and you will likely feel the dog exhale and the muscles begin to relax. Obviously, if the dog becomes more frantic, you have learned that this is a dog who needs to be left alone or just subject to soft touching.
- Crates may help some animals who like their crate and who voluntarily go there as a place to relax. In this case, a blanket draped over a crate may help these dogs. Dogs who dislike being crated will learn to fear the crates if they are forced to be in one during a storm. They will feel trapped, and the entrapment factor will make their phobia and panic worse.
- Sometimes, darker rooms, closets, rooms without windows, spaces under desks are sought by dogs who are distressed. Provide these opportunities and see if the dog calms. If she is calmer, you have one tool for helping your dog through her distress.

- Dog runs—almost without exception—will make storm phobic dogs worse, because the dogs cannot escape, feel fully surrounded by the storm, and, if there is a roof, it is usually of a material that makes the sounds odder and louder. Clients who keep their dogs outdoors may not even know if their dog reacts to storms until the dog runs away, breaks through the run, or breaks her teeth and otherwise injures herself attempting escape. Simple containment is not a solution for this very debilitating diagnosis.
- There are anecdotal reports of successful use of "calming caps" and "anxiety wraps." "Calming caps" alter what the dog can see and apply some mild pressure to the head and face. They are not suitable for aggressive dogs who cannot be manipulated, for dogs who cannot stand having anything over their face, or for those who will panic if they cannot see something. The "anxiety wraps" (www.anxietywrap.com, www.thundershirt.com) are meant to function very much like putting gentle but constant physical pressure on a dog would. Neither of these tools can easily be put on a dog who is thrashing around. Whether these tools are helpful has not really been rigorously tested, but some clients may wish to try them and collect the data for their dog. Repeated use may be somewhat helpful for some dogs.
- One trendy addition to the list of tools available is the Storm Defender Cape (www.stormdefender.com). This wraparound, belted cape seeks to decrease the dog's exposure to static electricity that may be associated with some storms. The principle being used here is that of a Faraday cage, where a mesh grid, usually copper, blocks transmission of static electricity. All MRI units, for example, have Faraday cages built into their walls and doors. The cape does not cover the dog's head, legs, or tail, so coverage is incomplete. The extent to which the dog may benefit may depend on the trigger for the dog's reactivity, the dog's body size, and the type of storm. One study showed that a "placebo cape" was just as effective as the brand name cape, suggesting that paying attention to the dog's needs and/or allowing the dog to feel snug may help.

Using Behavior Modification Rationally

Most active behavior modification involves desensitization (DS; gradual exposure to the stimulus or sound at a level below which the patient reacts; the sound volume is slowly increased over days or weeks as the dog continues to not react) and counter-conditioning (CC; rewarding the dog for not reacting with a stimulus like a food treat that competitively interferes with the dog's ability to react), or some combination of the two. The **Protocol for Deference** and the **Protocol for Relaxation: Behavior Modification Tier 1** are really plans for how to conduct basic desensitization and counter-conditioning. You can use these basic behavior mod plans with a program that involves exposing dogs to noises to which they react. Few quantitative studies examining the effects of this form of behavior modification on noise phobias exist, but *the general impression is that these types of desensitization programs, by themselves, don't work well for dogs with fully established phobias.* If the reaction to the noise or storm has just started, exposure to these sounds using tapes, records, or CDs

and an excellent stereo or quadraphonic sound system that can mimic some of the vibrational changes *might* work. Sources for these recordings change frequently, but CDs of natural events are available at some nature-themed stores or similar online sites, and there are many sources of a variety of noises from storms to explosions available online for those willing to search, and many of these have been produced with the intent of using them to desensitize dogs.

However, if the reaction to noise is severe, or has been ongoing a long time, exposure to recordings of noises and storms, alone, is unlikely to help and **may do further harm to the dog. Under no circumstance should anyone continue to expose a dog to these recordings if the dog remains at the same level of distress or becomes more distressed.** In some cases, as dogs begin to improve with drug treatment, exposure to sound recordings can be added and can help, but caution is urged regarding searches for quick fixes—there are none.

That said, devices that alter the dog's perception of the environment may help. Eye shades that permit either no light (useful for intense lightning storms and fireworks) or diffuse light can help some dogs to relax. If this is true, tinted Doggles or those with mesh may help (www.doggles.com) (see Figure A, below). Ear protection for dogs is also available in the form of Mutt Muffs® (www.muttmuffs.com) (see Figure B, below). Some dogs can gain relief from the use of any basic eye mask, like those used by humans on plane flights, that prevents them from seeing flashes of light. Because these fit loosely, most dogs do not resist them. Dogs should become used to these when not distressed (see Figures C and D, below). Any set of reactions that can be diminished will help the dog to improve, overall.



Figure A Tinted Doggles.



Figure B Muttmuffs. (Photo courtesy of Angelica Steinker.)

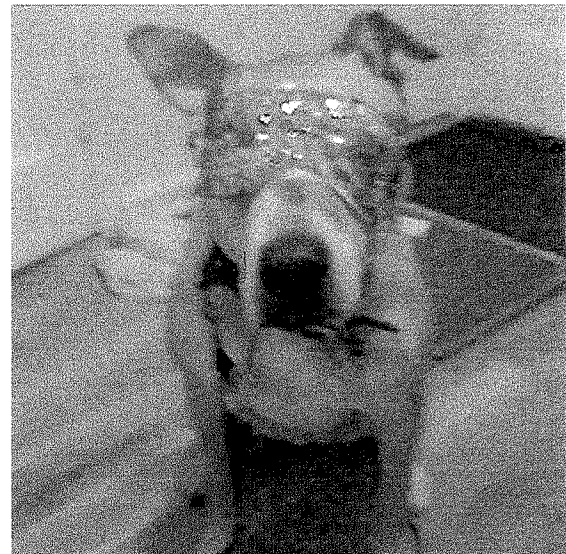


Figure C Human eye shades adapted for use on a dog. (Photo courtesy of Christina Shusterich.)



Figure D Accustoming dogs to human eye shades using an activity the dog enjoys.

Treatment Involving Medication

The most common, modern treatments for noise phobias involve drug treatment with medications designed to reduce or abort anxiety and panic. Most of the medications used are members of the class of drugs known as benzodiazepines, although alpha-agonists like clonidine and medications that affect serotonin like trazodone are being used more often. These drugs can have some drawbacks, including the potential induction of physiological dependence and the subsequent abuse that can follow. Dogs cannot open the bottles of medication by themselves so both abuse of and physiological dependence on benzodiazepines are avoidable, but there are some households that should not have benzodiazepines present. However, if used rationally for a dog who has had a complete physiological and laboratory evaluation that revealed no abnormalities, the benefits of this class of medication can be great and the risks few.

The list of medications commonly used to treat storm and noise phobias focuses primarily on benzodiazepines that can be given by mouth: diazepam, clorazepate, lorazepam, and alprazolam, with alprazolam being the drug of choice.

These medications are usually given "as needed," which is generally interpreted to be every 4 to 6 hours, the approximate half-life of many of the benzodiazepines. Instructions for how to use benzodiazepines, in general, and alprazolam, specifically are found in the handout, **Generalized Paradigm for Using Alprazolam for Noise and Storm Phobias, Panic, and Severe Distress**.

For dogs who react poorly to benzodiazepines, or who may not respond to them at all, some success has been reported for treatment of noise reactivity using clonidine, a medication that acts to block some of the cardiac reactivity that accompanies a panicky response.

The key to getting these medications to work is to get them into the dog **before** there are any behavioral, physical, or physiological signs of distress. For storm-related phobias, clients need to learn what the trigger for their dog is because it *may not* be the noise per se. Triggers can include flashes of light, noise, atmospheric pressure changes, ozone levels, et cetera. There are now a number of tools that can help clients monitor storms, including barometers, but the most useful might be Doppler radar. There are many weather programs that will download to laptops or handheld devices and can be set to alert you to certain atmospheric clues.

Regardless of the dog's cue, the client must get the drug into the dog **before** the dog begins to react to the stimulus. Accordingly, it may be good advice to recommend that the dog should be medicated if there is a 50% chance or greater of a storm and/or if the barometer is dropping.

The medications above are listed in order of duration from longer to shorter action of the parent compound. That said, no one wants a sedated or incoordinated dog and some of these medications (diazepam and clorazepate) are more likely to sedate dogs than are others (alprazolam). Alprazolam lacks an intermediate metabolite found in the other two medications that makes patients sleepy, so it is a better choice for most dogs. If people need very-long-acting benzodiazepines, medications like clonazepam, often used for some types of seizures and for sleep disorders, may be beneficial as it has a very long half-life (the amount of time it takes for one-half of the medication to leave your system).

Because so many of these medications produce another medication after passing through the liver, knowing the half-lives of both functional compounds and the individual dog's response to the medication may help you to know how frequently you need to provide medication for your dog. Benzodiazepines can be terrific medications, but they vary hugely in effect from one individual to the next. This lack of predictable effect is one reason why benzodiazepines are not used as often as they once were.

Clonidine, a centrally acting alpha_{2A}-adrenergic receptor agonist, is a hypotensive that lowers blood pressure by decreasing the amount of blood pumped and the tone or resistance of blood vessels. Clonidine is increasingly used in situations in which either the benzodiazepine and/or combinations of tricyclic anti-depressants/selective serotonin reuptake inhibitors have failed or are insufficient, and in dogs who are so hyperreactive that decreasing their sympathetic tone and arousal associated with noradrenaline/norepinephrine will help. Clonidine and other alpha-agonists show promise in treating dogs with profound noise phobia and panic disorders. Like benzodiazepine, it can be used as needed, and is generally given 30 to 90 minutes before the anticipated event. Unlike alprazolam, it does not lyse the panic and so cannot interrupt ongoing distress.

What About the Dogs Who Have Noise Phobia and Another Anxiety-Related Condition?

The goal of treatment of noise phobias and reactivity is not to sedate the dog; the goal is to stop the dog's distress while keeping the dog as normal as possible. These medications can be used on an "as-needed" basis in addition to the "maintenance medications," the tricyclic antidepressants (TCAs) and selective serotonin reuptake inhibitors (SSRIs). In fact, we now know that many dogs with separation anxiety also react to noises, and most animals that react to noises are at risk for developing some other anxiety. **If both of these or any other co-morbid conditions are not treated, the dog will not improve.**

For example, many dogs with separation anxiety will need a TCA or SSRI daily, and only need alprazolam if there is a storm, whereas others have a component of panic to their response to being left. In this case, the dog will also need alprazolam any time he is left, preferably **before** he begins to become distressed. This may mean that some dogs get some alprazolam every time the alarm goes off. If the medication and dosage are helping the dog, this is a good idea, but assessment is critical. For dogs who have other concomitant anxieties or anxiety-related problems or for those noise-phobic dogs who are profound, maintenance medication designed to lower the animal's overall reactivity and anxiety and to raise the threshold for a reaction involving panic is recommended. This means treating the dog on a daily basis with a TCA or SSRI.

Again, you must be able to assess the dog to see if the medication is making the dog worse (more incidents, greater intensity), better (fewer incidents, lesser intensity), or having no effect. By keeping daily logs and routinely videotaping the dog you will be able to note changes in many anxiety-related behaviors including destruction, elimination, self-mutilation, and barking. Panting and more subtle behaviors might require that you are present to observe them.

Regardless, pick some subset of the behaviors that the dog exhibits when distressed and monitor these for change. The information you gain will help you manage the dog's medication.

Finally, there is even some benefit to giving a benzodiazepine to the dog after they have already reacted. This won't abort the attack, but may shorten it and may also prevent the consolidation of some short-term memory about how terrible the experience was. Alprazolam is truly "panicolytic," in other words, something that cuts through panic and can and should be given during a storm or panic attack. It's important to remember that we all learn to panic or become anxious the more often it happens, so the humane thing to do is to use medication every time it's needed.

Clearance of these drugs is through liver (hepatic glucuronidation pathways) and kidney (renal) excretion, so knowing that the pathways are not impaired is important if we are to avoid side effects and minimize risk. We can learn about the animal's ability to metabolize the drugs by taking a blood sample and looking at serum kidney and liver enzymes. All TCAs affect the reuptake of both serotonin and norepinephrine, and the extent to which they do this for each catecholamine depends on the specific TCA. The effect that is desirable is the one associated with reuptake inhibition for serotonin; anxiety has been associated with low levels of serotonin. The SSRIs primarily affect serotonin, and most are relatively specific for one class of receptor thought to be involved in many anxiety-related conditions, the 5HT_{1A} subtype receptor.

As is true with humans, no one medication works for everyone and three or four medications or medication combinations may need to be tried before one that is successful is identified. Unfortunately, because of the amount of time needed to determine that a medication is not helpful to the dog, you may need 4 to 6 months to try different medications or medication combinations. By playing the odds of the patterns discussed above, we may find which medication may work more quickly. You should be engaged in behavior modification programs designed to teach the dog a more relaxed response while treating or trying to treat your dog with medication.

Lifelong maintenance medication may be necessary; some of these animals may have a true deficit of serotonin or an altered serotonin functioning in the same way diabetics can

have a deficit of insulin. We generally ask clients to keep the dog on the drug for the amount of time it took to get the dog as perfect as possible, plus 30 days, and then wean the dog from the medication at the rate it took for the dog to improve. This translates to 4 to 6 months of treatment, minimally. If medication is long-term or lifelong, annual physical and laboratory evaluations are useful. There appear to be no side-effects of long-term treatment in healthy animals.

Remember that this entire discussion assumes that the client is also doing the relevant behavior modification. There are no quick fixes, and indiscriminate use of drugs leads to treatment failures.

More detailed information and advice on the use of these medications is found in the handout, **Protocol for Using Behavioral Medication Successfully**.

Summary

- Treatment of the noise/storm phobic dog with medication *before* the expected noise or storm, especially when combined with general behavior modification designed to teach the dog to relax while avoiding inadvertent reassurance of abnormal and undesirable behaviors, can be successful.
- As with most problems involving panic and anxiety, the earlier we can intervene, the greater the chance of success.
- Please remember that this is a condition that will require a degree of management, including anticipating when the dog is likely to be exposed to a scary noise (e.g., the use of online weather programs and Doppler radar), and protecting the dog while they continue to improve (e.g., using eye shades, head phones, rooms without windows where the dog feels secure, et cetera).
- For some dogs treatment is lifelong, and for some dogs it will be short-term.
- Phobias, once present, are extremely difficult to completely obliterate because the memory of a phobic response can trigger another panicky response.
- In reality, it doesn't matter if the dog always has the potential to react throughout his life, if we can ensure that we can alleviate the distress the dog feels whenever the noises that scare the dog occur. For the vast majority of dogs, we can now alleviate the fear and panic experienced during a noise phobic event, and that's a very good place to start.