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Medical drugs side effects.

Drug dosages, interactions, side effects and contraindications.

Dosages below are given in mg (milligrams) per kg (kilogram) of body weight of the dog.

1 kg is 2.2 lbs.

The most commonly recommended dosage range is given, followed by other ranges where applicable.

Note that some of these drugs are available in liquid form if smaller doses are needed, or you could use a compounding pharmacy.

Benzodiazepines.

Alprazolam (Xanax®): 0.01 – 0.1 mg/kg as needed (I've seen higher dosages listed in one place, up to 2.2 mg/kg two to four times a day, but most recommendations are within the 0.01 – 0.1 range, 2 to 4 times a day).

Clonazepam (Klonopin®): 0.01 – 0.1 mg/kg as needed or 0.05 – 0.25 mg/kg once or twice a day for phobic or panic attacks. Updated dosage recommendation from [Dr. Overall](#): 0.5 mg/kg every 8 to 12 hours (start lower and increase as needed).

Note that dosage for seizures is 0.1 – 1.0 mg/kg twice a day

Diazepam (Valium®): 0.5 – 2.2 mg/kg every four to six hours as needed.

A given limit of 4 mg/day for alprazolam and clonazepam apparently comes from human guidelines.

However, dosages for dogs are relatively higher than for humans, and dosages for seizure control are also much higher than this.

A 15 kg dog can get as much as 3 mg/day of alprazolam or 6 mg/day of clonazepam, with no side effects.

A larger dog could handle correspondingly larger doses, based on the ranges given above, without regard to the 4 mg/day limitation.

When using benzodiazepines for noise phobias or separation anxiety, it is best to give them one to two hours before the anticipated noise or stimulus, and then repeat as needed.

Benzodiazepines should **not be given** with the antifungal medications **ketoconazole or itraconazole**.

Cimetidine (Tagamet), erythromycin, propranolol and valproic acid **will slow** the metabolism of these drugs and can create excessive sedation.

Antacids decrease absorption and should be given separately, at least two hours apart.

Benzodiazepines should be used with caution in the case of liver or kidney disease, or narrow angle glaucoma.

Side effects such as sedation or increased appetite usually go away with continued usage.

Azapirones.

Update

Dr. Dodman says that when **Buspirone** doesn't work for anxiety issues, it is usually due to the dosage being too low. He recommends starting with a dosage of 1 mg/kg of body weight twice daily.

This dosage can be doubled if needed.

For motion sickness.

Buspirone can also be used for dogs with motion sickness. Give 1 mg per pound of body weight an hour before leaving.

For mild anxiety.

Buspirone (BuSpar®): 1 mg/kg, one to three times a day
(recommendations range from 0.5 - 2 mg/kg two or three times a day; older recommended dosage was 10-15 mg/dog every 8-12 hours)

Buspirone should be used with caution in dogs with severe liver or kidney disease.

Side effects are uncommon.

Combining Buspirone with MAOIs (see below) may cause dangerous hypertension (high blood pressure).

TRICYCLIC ANTIDEPRESSANTS (TCAs) and SELECTIVE SEROTONIN REUPTAKE INHIBITORS (SSRIs)

Update

Dr. Dodman says that SSRIs are safer than TCAs; no known toxicity from SSRIs.

Prozac as first choice for treating dogs with separation anxiety and fear aggression.

Clomicalm (clomipramine) package dosage description of 1 to 2 mg/kg once or twice a day **is wrong**.

The recommended dosage **should be** 2 mg/kg twice a day.

TCAs and SSRIs as two types of drugs for this discussion are grouped together as they have similar properties and side effects.

TCA's:

Start with a low dose and increase as needed every two weeks up to the maximum dosage. It may take four to six weeks to see improvement.

Amitriptyline (Elavil®): 1-2 mg/kg, twice a day (recommendations range from 0.25 to 6 mg/kg once or twice a day)

Clomipramine (Clomicalm®): 1-3 mg/kg, twice a day (one site said dosage could be increased to 4 mg/kg twice a day, if needed to be effective)

SSRIs:

Fluoxetine (Prozac®): 1mg/kg, once or twice a day (recommendations range from 0.5 - 3 mg/kg once a day)

Paroxetine (Paxil®): 0.5 - 1 mg/kg, once a day. Dosages of up to 3 mg/kg once a day may be used for compulsive disorders

Sertraline (Zoloft®): 1 to 3 mg/kg, once a day (recommendations range from 0.25 - 4 mg/kg once a day)

SSRIs must be given a minimum of three to five weeks in order to assess the effects, and may take six to twelve weeks to reach full effectiveness.

Paroxetine can be particularly difficult to wean off.

In humans, 20 mg Prozac is considered equivalent to 50 mg Zoloft.

Update.

Dr. Dodman only talked about anticholinergic effects (dry mouth, urine retention) with TCAs, not SSRIs.

For SSRIs, about 20% of dogs will have some loss of appetite or lethargy. Restlessness or twitching indicate the dosage is too high.

Because of its anticholinergic effects, clomipramine may be a good choice for dogs with elimination problems linked to separation anxiety.

Both TCAs and SSRIs may cause side effects, including dry mouth (which may show up as frequent lip licking), urine retention, heart rate disturbances, constipation and gastrointestinal effects such as vomiting or inappetence.

The most common side effect is sedation.

Loss of appetite is also common, but usually goes away after a few days.

Giving with food and dividing the dosage between meals may decrease gastric side effects.

TCAs can cause bone marrow suppression and may affect the liver.

They may also lower seizure threshold in epileptic patients.

These side effects may be more likely with clomipramine.

It is best to check blood work two weeks after starting these drugs to make sure that your dog is not having any adverse effects, then continue to monitor every six months to a year thereafter.

They should be used with caution in dogs with liver or kidney impairment, heart problems or seizure disorders.

Older dogs should have blood work done and possibly an ECG to check for cardiac arrhythmias before starting these drugs.

The dosage may need to be reduced in dogs with liver or kidney disorders.

Update

Dr. Dodman feels it is safe to combine most behavior medications, and some even enhance the effect of others (e.g., Prozac increases the action of clomipramine).

It's also OK to switch from behavior medication to another without an interval in between.

Other combinations that may be effective include combining Prozac with buspirone or Elavil, or combining Elavil with beta blockers, such as propranolol.

MAOIs, such as Anipryl and Amitraz, are the exception, as they are dangerous to combine with SSRIs, TCAs, and many other medications.

TCAs and SSRIs can be dangerous to combine with each other or with other drugs, including antihistamines, anticonvulsants, anesthetics, MAOIs (see below), and even herbs such as kava kava or St. John's wort, and L-tryptophan, an amino acid.

TCAs can be combined with SSRIs cautiously, using low dosages of each, which may reduce the potential for side effects and speed the time they take to become effective.

The most common risk when combining SSRIs or TCAs with each other or with other drugs is serotonin syndrome, characterized by lethargy or agitation, incoordination, fever, tremors or seizures.

Serotonin syndrome can be dangerous, even fatal.

TCAs may lower seizure threshold, and may make glaucoma worse.

They may lower thyroid levels, which is not a problem but could lead to a misdiagnosis of hypothyroidism. They can have cardiovascular effects, so care and monitoring is needed during general anesthesia.

The use of cimetidine (Tagamet) may slow the removal of these drugs from the system, allowing them to build to toxic levels. Cyproheptadine (an antihistamine sometimes given for allergies) may decrease or reverse the effects of SSRIs.

Both TCAs and SSRIs have some effect against chronic pain.

Other drugs.

MAOIs

Never combine SSRIs, TCAs, buspirone, or trazodone with monoamine oxidase inhibitors (MAOIs), such as selegiline Anipryl, used to treat senility [canine cognitive dysfunction] and [Cushing's Disease](#), or amitraz (used in the Preventic and other Tick Collars, and in Mitaban, which is used to treat demodectic mange).

You should wait at least 2 weeks after discontinuing MAOIs before starting any SSRI or TCA. Because of the long half-life of drugs such as fluoxetine (Prozac), you should wait at least 5 weeks after discontinuing use of SSRIs or TCAs before using Anipryl or amitraz.

MAOIs may also lead to high blood pressure when combined with buspirone or DLPA (dl-phenylalanine, used to treat chronic pain).

Tramadol (Ultram)

Tramadol pain medication use with SSRIs or TCAs has the potential for serotonin syndrome but used together with caution and is safe to combine with benzodiazepines.

It makes sense that if high doses are not being used, the risk of serotonin syndrome should be reduced.

Melatonin

Update

Melatonin is very safe and cannot be overdosed. He would give 3 mg for dogs weighing 40 to 60 pounds, but says it's fine to give 6 mg or even 9 mg if needed. He has given as much as 9 mg to a Golden Retriever on the Fourth of July with good results.

Although no studies have been done, pharmacists have told me it is safe to combine melatonin with any of these other drugs, at least on an occasional basis. Melatonin is a hormone to treat jet lag in humans. It has been found to be effective in 80 percent of dogs with thunder phobia.

Recommended dosage is 3 mg for dogs over 35 lbs, 1.5 mg for smaller dogs, maybe less for really tiny dogs, given no more than once every 8 hours, as needed for short term use.

Higher doses for larger dogs are sometimes used. I am using melatonin with Piglet on occasion when I feel a little extra help is needed.

Propranolol (beta blocker)

Update

Beta blockers is recommends for dogs with separation anxiety, storm phobia, and other phobias.

They can also help when fear leads to aggression.

Beta blockers are prescription medications used to treat heart disease.

They help reduce anxiety by decreasing the "flight or fight" response.

Propranolol takes about an hour and a half to take effect, and the effects last for a few hours.

A longer-acting (up to 8 hours) version called Inderal is also available.

Typical dosage for anxiety is 0.15 to 0.5 mg per pound (0.3 to 1.0 mg/kg) three times daily.

Side effects are uncommon, but heart rate may be decreased, which can cause weakness.

May interact with sedatives, cimetidine, insulin, lidocaine and theophylline.

Clonidine (alpha 2 agonist).

Update.

Clonidine as first choice for dogs with storm phobia is preferred for use instead of alprazolam (Xanax) when quick action is needed as it won't cause paradoxical excitement, increased aggression, or addiction.

Recommended dosages up to 0.05 mg/kg (about 1 mg for a 40-pound dog) twice a day or as needed.

The drug takes effect in about half an hour and lasts three to four hours.

Clonidine, a prescription medication used to treat high blood pressure, is also used to reduce the "flight or fight" response.

The most common side effect is sedation.

It can also cause low blood pressure and slow heart rate.

Recommended dosage for anxiety is 0.1 mg for dogs <20 lb, 0.2 mg for dogs 20-50 lb, 0.3 mg for dogs >50 lb.

It is given once a day with food. Effect lasts about 6 hours; may take one to two weeks to reach maximum effect.

Should be weaned off to avoid a sudden spike in blood pressure.

Do not change dosage without a vet's approval.

May increase the effects of other sedating drugs such as opiates and barbiturates.

Combining with TCAs may block the hypotensive effect, but combining with amitriptyline has caused corneal lesions in rats.

Due to the cumulative effect on heart rate, caution should be used if combining with beta blockers, calcium channel blockers, or digitalis.

Trazodone (new)

A 2012 article on anxiolytic drugs "Beyond the Front Line:

Trazodone and other Ancillary Treatments for Anxiety" by Margaret E.

Gruen, DVM, MVPH, DACVB, discusses the use of Trazodone as an adjunctive medication, something that is added to other drugs to make treatment more effective.

Trazodone may work synergistically with SSRIs, such as fluoxetine (Prozac).

It can be given daily, or only as needed.

Side effects are generally mild and may include gastrointestinal upset, sedation, excitement, and panting.

It takes effect in about an hour and is best given before the onset of anxiety (e.g., before a storm starts).

Dosages of 5 to 30 mg/kg daily, divided into two or three doses, have been given, but when used as an adjunctive treatment, starting dosage is usually lower, then adjusted as needed to achieve results.

If used long term, dosage may need to be increased over time as tolerance develops.

Do not combine with MAOIs such as amitraz (see above).

The article also contains information on benzodiazepines, clonidine, buspirone, gabapentin, and nutraceuticals, along with recommendations for specific situations.

Acepromazine.

"Ace" should *not* be used to treat anxiety or noise phobias.

It is a tranquilizer that makes the dog unable to react but does nothing to decrease his anxiety -- and can actually make it worse.

It is advised that Ace could be used for emergencies, to force the dog to sleep if absolutely nothing else is working.

See these excellent articles on why acepromazine and related drugs are inappropriate for treating anxiety:

[Acepromazine](#) on the Fearful Dogs site

[Why You SHOULDN'T Use Acepromazine For Cats and Dogs With Fireworks or Thunderstorm Fears](#)

NMDA Blockers.

Update.

New research indicates that gastrointestinal disorders are frequently at the root of repetitive oral behaviors in dogs, including excessive licking of surfaces

and fly biting. Treating the GI disorders can result in significant reduction of these behaviors.

See Compulsive disorders: Have you considered GI involvement?

A new class of drugs used to treat obsessive-compulsive disorder (OCD) in dogs.

Namenda (memantine), which is very expensive;

Dextromethorphan (found in some cough medicines);

Huperzine-A (extract of the Chinese Club Moss).

Amantadine is a cheaper NMDA blocker; recommended dosage is 3 to 5 mg/kg once a day.

Recommended dosage of dextromethorphan is 2 mg/kg twice a day, which he has used successfully for lick granulomas and other

[self-directed scratching, biting, or chewing in dogs with allergies.](#)

Huperzine-A has some anticonvulsant properties and so may help dogs with OCD related to partial seizures.

Recommended dosage was 50 mcg twice a day (25 mcg for a small dog).

Recommended natural anxiety products:

Anxiety Wrap, Thundershirt, or Storm Defender Cape (available at Amazon)

Adaptil (formerly D.A.P.) dog appeasing pheromone products (available at Amazon)

Animals' Apawthecary's Tranquility Blend (available at Amazon)

Tasha's Easy Does It Formula

Azmira's Calm & Relax, and Herbal Calm (available at Amazon)

Missing You herbal tablets

Composure Liquid (available at Amazon), also called Calming Formula (available at Amazon).

The same product comes in chewable form called Calming Soft Chews (available from Amazon)

ProQuiet chewable tryptophan tablets (available at Amazon)

Chill Pill aromatherapy liquid made by Aura Cacia

Sound recordings for use with desensitization programs:

Sound Therapy 4 Pets.

Gentle Leader Canine Sound Desensitization.

Mutt Muffs are over-the-ear "headphones" designed to reduce noise.

They couldn't be worn all the time, but might possibly be helpful in situations where your dog must be exposed to "scary noises."

"I'd be interested in hearing back if anyone tries them (see my contact info at the bottom of the page).

Thunderstorm Phobia by Sara Reusche, CPDT-KA, CVT, for a good overview of using both natural methods and medication as needed by a dog trainer with a special fondness for reactive and anxious dogs.

References.

Karen L. Overall, MA, VMD, PhD, DACVB, CAAB.

Noise reactivities and phobias in dogs: Implementing effective drug therapy (2011 article that includes information on clonidine)

Pharmacological modification of behavior in dogs and cats (2010)

Storm Phobias (2004) note there is a typo in the dosage of alprazolam given, it should be 0.01-0.1 rather than 0.01-0.001 mg/kg)

Pharmacology and Behavior: Practical Applications (2002)

Pharmacology and Behavior: Review of Commonly Used Drugs (2001)

Beyond the Front Line: Trazodone and other Ancillary Treatments for Anxiety (2012).

By Margaret E. Gruen, DVM, MVPH, DACVB.

Includes information on trazodone, benzodiazepines, clonidine, buspirone, gabapentin, and nutraceuticals, along with commendations for specific situations.

Using clonidine and trazodone for anxiety-based behavior disorders in dogs

(2014) by Kelly Ballantyne, DVM, John Ciribassi, DVM, DACVB

Separation Anxiety, Fears and Phobias

by Diane Frank, DVM, Diplomate ACVB

Separation and other Anxiety disorders in Dogs

by Dr. Michael Richards, DVM

Thunderstorm Anxiety & Storm Phobia

by Gloria Manucia, PhD. M.C.P

Thunderstorm Phobia

Fearful Dogs

Web site dedicated to helping fearful dogs and their owners.

Canine Fearfulness

Includes sections entitled "Don't let phobias put your dog in a tailspin," "Socialization and fearfulness toward other dogs," and "Shyness/fearfulness toward people."

Dealing with Sound Phobias

Sarah Heath BVSc DECVBM-CA MRCVS

Proceedings of the World Small Animal Veterinary Association Sydney, Australia – 2007

How do antidepressants work (in dogs and the rest of us)?

by Jessica Perry Hekman, DVM, MS