Management of Attention-Deficit Disorder and Attention-Deficit/Hyperactivity Disorder Drug Intoxication in Dogs and Cats

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• ADHD • ADD • Drug intoxication • Dog • Cat
• Amphetamines • Atomoxetine

Attention-deficit/hyperactivity disorder (ADD/ADHD) is defined as "a neurodevelopmental behavioral disorder resulting in a pattern of inattention and/or hyperactivity that causes impairment in social, emotional, cognitive, behavioral, and academic functioning,"[1] and it is treated with a variety of stimulants, in both immediate-release and extended-release formulations. The purpose of using the stimulant drugs is to improve brain levels of serotonin and norepinephrine.

Specific drugs prescribed for the management of ADHD include both amphetamine class stimulants and nonstimulants such as atomoxetine (Strattera) (**Table 1**).[1] When these drugs are ingested by dogs and cats, although the drugs differ in rate of absorption and time to onset of clinical signs, those signs are very similar and can be managed similarly. Key to the treatment of dogs and cats is to manage signs as they develop and not delay treatment while the ingested agent is identified.

Second-line therapy may include the use of antidepressant class medications such as imipramine, bupropion, or nortriptyline for patients who do not respond adequately to the first line stimulants or who have coexisting mood disorders. This article does not address these nonstimulant agents beyond noting that they may be included in the general grouping of "ADHD drugs" in the case of ingestion by a household pet.[1]

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Table 1
Amphetamine class ADHD drugs

Trade Name	Generic Name	Available Formulations
Adderall	amphetamine	5-, 7.5-, 10-, 12.5-, 15-, 20-, and 30-mg tablet
Adderall XR	amphetamine (extended release)	5-, 10-, 15-, 20-, 25-, and 30-mg capsule
Concerta	methylphenidate (long acting)	18-, 27-, 36-, and 54-mg tablets
Daytrana	methylphenidate patch	10, 15, 20, and 30 mg/9-h patch
Desoxyn	methamphetamine hydrochloride	2.5-, 5-, 10-, and 15-mg tablets; 5-, 10-, and 15-mg SR tablets
Dexedrine	dextroamphetamine	5-, 10-, and 15-mg Spansule XR
Dextrostat	dextroamphetamine	5- and 10-mg tablets
Focalin	dexmethylphenidate	2.5-, 5-, and 10-mg tablets
Focalin XR	dexmethylphenidate (extended release)	5-, 10-, 15-, 20-, 30-, and 40-mg XR capsules
Metadate ER	methylphenidate (extended release)	20-mg extended-release tablet
Metadate CD	methylphenidate (extended release)	10-, 20-, 30-, 40-, 50-, and 60-mg XR capsules
Methylin	methylphenidate (oral solution and chewable tablets)	2.5-, 5-, and 10-mg chewable tablets; 5-, 10-, and 20-mg tablets; 5 and 10 mg/tsp solution; 10- and 20-mg XR tablets
Ritalin	methylphenidate	5-, 10-, and 20-mg tablets
Ritalin SR	methylphenidate	20-mg SR tablet
Ritalin LA	methylphenidate (long acting)	10-, 20-, 30-, and 40-mg XR capsules
Strattera	atomoxetine	10-, 18-, 25-, 40-, 60-, 80-, and 100-mg capsules
Vyvanse	lisdexamfetamine dimesylate	20-, 30-, 40-, 50-, 60-, and 70-mg capsules

Abbreviations: SR, sustained release; XR, extended release.

AMPHETAMINE SALTS AND OTHER SIMILAR AGENTS

Use in Veterinary Medicine

Amphetamines were used in veterinary medicine to increase the respiratory rate and depth in animals undergoing anesthesia with barbiturates, due to its stimulatory effects on the medulla oblongata.[2] Methylphenidate has also been used for the treatment of narcolepsy in dogs, although it has been only partially effective when used as the sole treatment.[3] Amphetamine use was placed under strict control by the 1970 Controlled Substances Act. Amphetamines are no longer available for veterinary use in the United States.

Mechanism of Toxicity

Amphetamines cause release of catecholamines, resulting in the stimulation of the cerebrospinal axis, especially the brain stem, cerebral cortex, medullary respiratory center, and reticular activating system.[2,4] Amphetamines cause marked increased in the release of norephinephirine, dopamine, and serotonin from presynaptic terminals.[5,6] Monoamine oxidase is also inhibited, which is one of the metabolic pathways