Pot and Pets: Updates on Marijuana Intoxication in Dogs and Cats

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What is Pet Poison Helpline?

• 24/7 animal poison control center
• Veterinary & human expertise
  - 20+ DVMs, 75+ CVTs
  - DABVT, DABT
  - DACVECC
  - DACVIM
  - 10 PharmDs
  - 2 MDs
• Case fee of $59 includes
  - Unlimited consultation
  - Fax or email of case report
• Educational center
  - Free webinars (archived)
  - Tax tools
  - Wheel of Vomit
  - Pot of Poisons (toxic plants)
  - Textbook
  - iPhone app
  - Newsletters for veterinary professionals
  - Free resources for clinics
    - Videos
    - Electronic material
    - Clings
  - Email us for info!

Pet Poison Helpline® and Nationwide®
Nationwide® & Pet Poison Helpline® working together

- Shared mission in highlighting the importance of preparing for accidents and poisonings in small animals
- Addressing the cost of veterinary care Nationwide® covers the $59 Pet Poison Helpline® fee when an insured pet is brought in to your hospital for care
- Enabling best medicine Pet owners with Nationwide® spend twice as much on their pets than those without pet insurance

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With more than 35 years of experience protecting pets, there’s nothing we haven’t seen...

Available plans

- $67.70/month
- $34.25/month
- $17.75/month
Speaker Introduction
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Today’s Topics
• THC vs CBD vs synthetic cannabinoids
  – Sources
  – Clinical signs
  – Treatment & diagnostics
  – Pharmacology/physiology

Terminology
• Marijuana
  – General term referring to Cannabis sativa and/or cannabis indica plants, or portions of the plants, which are used for pharmacologic effects.
  – Synonymous with cannabis
• Cannabinoid
  – Individual compounds in Cannabis plants
  – ~100 exist
  – Examples: THC and CBD
3 cannabinoid categories
(for this lecture)

- THC
  - Psychoactive cannabinoid, induces a “high”
  - Legal in some states for recreational or medical use
  - Often what’s meant by term “marijuana”
  - Likely cause of most clinical signs following pet exposure to marijuana products

- CBD (cannabidiol)
  - Non-psychoactive cannabinoid
  - Legal in most states for recreational or medical use
  - Commonly marketed for use in pets (treats, oil, etc.)
  - Being researched for epilepsy and osteoarthritis in dogs/cats
  - Wider margins of safety

- Synthetic Cannabinoids
  - Illegal recreational product (all states)
  - Called “K2”, “spice”, etc.
  - Stronger affinity for CB receptors
  - Often contains more than just cannabinoids
  - Severe effects, especially CNS stimulation

What is hemp?

- Cultivar of Cannabis sativa plant
  - “Industrial hemp” ≤ 0.3% THC (dry weight basis)
    - Very low compared to recreational marijuana
  - “Medicinal hemp” = higher CBD concentration

Endocannabinoids

- Naturally-occurring substances that act within the same signaling system as exogenous cannabinoids
  - Two main “endocannabinoids”
    - Anandamide = N- arachidonoylthanolamine = AEA
    - 2-arachidonoylglycerol = 2-AG
Physiology/Pharmacology

- **Endocannabinoids**
  - Produced naturally, on-demand, in response to stress
  - Largely inhibit neurotransmitter release
  - Target CB1 & CB2 receptors
- **Exogenous cannabinoids**
  - THC & CBD
  - THC has stronger affinity for CB1 than endogenous CBs

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**LET’S TALK ABOUT THC**

Marijuana Trends at PPH

- 450% increase in cases over 6 yrs

SOURCE
Edibles (THC)

- #1 cannabis source @ PPH
- 70% involve chocolate
- Top sources:
  - Brownies & cookies
  - Cholate bars/choc covered fruit
  - Gummi bears
  - Butter/coconut oil
- Risk:
  - High concentration THC
  - Better bioavailability (butter/oil)
  - Co-ingestants
Dried plants (THC)

- #2 source
- Not your parent’s plants...
  - 0.4-30% THC
  - 1 g joint = 150 mg THC
- Vomiting common

Mature plant, courtesy of Minnesota Medical Solutions
Marijuana Concentrates

• 50-90% THC
• Smoked or vaped
• High risk to pets

What is “medical cannabis”?

Marijuana Clinical Signs, Dogs

• Common
  • CNS depression
  • Ataxia
  • Bradycardia (occasional tachycardia)
  • Urinary incontinence
  • ~25% develop agitation
  • Glazed expression

• Less common
  • Vocalizing, vomiting, diarrhea, hypothermia, hypersalivation, mydriasis, hyperesthesia, seizure (very rare), coma
Clinical Signs in Dogs & Cats

Recommended treatment site

Diagnostics

• Signs + history

• Any tests?
  – CBC/chem/UA typically normal
  – Human urine drug test?
    • Often false negative on OTC urine test
    • False positives in humans caused by:
      – Ibuprofen, naproxen, niflumic acid, etavirenz
    – Best: Vet diagnostic lab, LC/MS
      • GI contents
      • Urine/serum
      • Liver/kidney

Marijuana (THC) – Treatment

- Decontaminate
  - Emesis
  - Activated charcoal

- Supportive care!
  - No antidote
  - Monitor body temp
  - IV crystalloids for perfusion

- Agitation/seizures
  - Butorphanol
  - Acepromazine (contraindicated if hypotensive)
  - Diazepam, phenobarbital, propofol, levetiracetam

- Monitor
  - Temp
  - Heart rate
  - Blood pressure

- Lipid therapy?
  - Fat soluble agent
  - 20% intravenous lipid emulsion
  - Not routinely recommended by PPH

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SYNTHETIC CANNABINOIDS

3 cannabinoid categories (for this lecture)

THC
- Psychoactive cannabinoid, induces a “high”
- Legal in some states for recreational or medical use
- Often what’s meant by term “marijuana”
- Key cause of most clinical signs following pet exposure to marijuana products

CBD (cannabidiol)
- Non-psychoactive cannabinoid
- Legal in most states for recreational or medical use
- Currently restricted for use in pets (hemp, oils, etc.)
- Being researched for epilepsy and osteoarthritis in dogs/cats
- Wider margin of safety

Synthetic Cannabinoids
- Illegal recreational product (all states)
- Odor “K2”, “Spice”, etc.
- Stronger affinity for CB receptors
- Often contains more than just cannabinoids
- Severe effects, especially CNS stimulation
Synthetic cannabinoids

- “K2”, “Spice”, etc.
- Smoked
- In 2010 became popular in US as a “legal high”
  - Used to be sold in gas stations, online, head shops, etc.
  - Now illegal
  - Potency varies dramatically
- Contain
  - Synthetic cannabinoids (hundreds of options)
  - CB1 and CB2 agonists
  - +/- NMDA
  - Variety (10+) herbs
  - Contaminants (e.g. anticoagulant rodenticides)

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**Number of overdoses linked to suspected bad batch of synthetic marijuana rises in New Haven**

NEW HAVEN, Conn. — The number of overdoses linked to a suspected bad batch of synthetic marijuana has risen in New Haven, Connecticut, and surrounding areas.

People on and around the streets near the Haven Drive and Yale University began falling ill shortly after 6pm. Police, medics, and the overdoses continued late Thursday night. The addicts were reported and most people brought to hospitals were treated, officials said.

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**Cluster overdoses**

*The New York Times*

All content by Google

*New Haven Overdoses Tied to Laced K2*
FDA Statement

Statement from FDA warning about significant health risks of contaminated illegal synthetic cannabinoid products that are being encountered by FDA

Statement from Commissioner Scott Gottlieb, M.D., Peter Marks, M.D., Ph.D., director, Center for Biologics Evaluation and Research, and Jeffery Sh rotto, M.D., director, Center for Drug Evaluation and Research

For Immediate Release July 18, 2018

Clinical Signs in Dogs & Cats

Recommended treatment site
Synthetic Cannabinoids

• Treatment
  – Supportive
  – Expect to use more anticonvulsants
  – Expect the unexpected

• Diagnostic testing
  – Difficult due to large number of compounds
  – Call D-Lab before sending

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Current Canine Research with CBD

- Colorado State University (Bartner et al, 2018)
  - Safety, toxicity and pharmacokinetic study (n=30 beagles)
    - 3 CBD formulations—microencapsulated beads, oil, transdermal cream
    - ~10 & ~20 mg/kg daily x 6 weeks
    - Best PK profile with oral oil
    - Adverse effects = diarrhea and elevated liver enzymes
- Cornell University (Gambel et al, 2018)
  - Oral pharmacokinetics & safety
    - Single dose, 2 & 8 mg/kg oil
  - Analgesic efficacy in osteoarthritis (n=16 client owned dogs)
    - Stat. sig. ↓ in pain, ↑ activity @ 2 mg/kg PO q12h x 4 weeks
    - 9/16 dogs stat. sig. ↑ ALP

Example of CBD containing product for people

CBD products for pets
**DEA Drug Schedules**

- **Schedule I**
  - No medical value. High potential for abuse.
    - Heroin, LSD, ecstasy
- **Schedule II**
  - Medical value. High potential for abuse.
    - Cocaine, hydromorphone, methamphetamine, Adderall, Ritalin
- **Schedule III**
  - Moderate to low potential for abuse.
    - Ketamine, testosterone, anabolic steroids
- **Schedule IV**
  - Low potential for abuse/low risk of dependence
    - Tramadol, diazepam, alprazolam (Xanax)
- **Schedule V**
  - Lower potential for abuse than IV, sold in limited quantities
    - Robitussin AC (codeine), Lomotil, Lyrica

**PPH Experience with CBD**

- #1 source = oil
  - Can be mixed with essential oils

- Signs: Variable
  - Asymptomatic
  - Lethargy, ataxia, agitated
  - Vomiting
Clinical Signs in Dogs & Cats

Recommended treatment site

Concerns with CBD?

- Product quality
- P450 inhibition
  - Humans: CYP1A1, 2C9, 2C19, 2D6, 3A4, 3A5
  - Drug-drug interactions similar to ketoconazole
- Decreased spermatogenesis (high doses)
- Rhesus macaque
  - 150 mg/kg IV = tremors, hypopnoea
  - 200 mg/kg IV = resp arrest and cardiac failure
  - 30-300 mg/kg oral x 90 days
    - ↑ liver, kidney, heart weights
    - ↓ testicular size, ↓ spermatogenesis

Summary

- Higher risk for poisoning
  - THC-containing products
  - THC concentrates (butter-based, medical)
  - Co-ingestants (e.g. chocolate, raisins)
  - Synthetic cannabinoids
- Less concerning
  - CBD alone in trustworthy products
- Treatment is primarily supportive
  - ILE not used as first-line treatment
- Quality of products due to no regulation

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Blackwell's Five-Minute Veterinary Consult Clinical Companion:
Small Animal Toxicology
2nd Edition
Drs. Lynn Hovda, Ahna Brutlag, Robert Poppenga, Katherine Peterson

• Provides concise, bulleted information focused on the most important facts needed when treating a poisoned cat or dog
• Carefully organized for ease of use in an emergency, with important toxicants arranged alphabetically within categories
• Details clinically relevant information on the most common toxicants encountered by small animals
• Presents a wealth of color photographs to aid in plant identification
• Includes 16 new topics to this edition covering cyclosporine A, sleep aids, tacrolimus, bath salts, synthetic marijuana, poisonous plants, imidacloprid, spring bulbs, and sodium monofluoroacetate

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• Questions? Need more info? Visit our careers page at petpoisonhelpline.com/veterinarians/job-opportunities or email careers@safetycall.com.
2018 CE Schedule
Free, RACE-Approved Webinars

FEBRUARY 13, 2018 - Renee Schwind, DVM
Approaching Pet Owners Correctly: Right From the Start!

APRIL 24, 2018 - Katherine Peterson, DVM, DACVECC
Beyond Conventional: AdvancedILDTherapy for the Acute Patient

JUNE 5, 2018 - Susan Holland, DVM, DACVECC
Gastrointestinal Ulcers: Understanding the Natural History and Treatment

SEPTEMBER 29, 2018 - Dr. Tim Keenan, NAD, DAVFT, DABYT
Marijuana Intoxication in Cats and Dogs

NOVEMBER 8, 2018 - Heather Handy, DVM
Managing Psychiatric Conditions in Pets

Questions?

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3. Can I watch the recorded webinar online for CE credit? Yes. You can receive non-interactive CE credit. Go to the “For Vets” page on our website, www.petpoisonhelpline.com for more info.

Comments? Questions? Email us! info@petpoisonhelpline.com

Thank you for attending!

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Thank you for attending!