Outline

• Veterinary Oversight
• Needs in a shelter
  • Preventive, anesthesia/surgery, therapeutic
• Characteristics of Ideal medications for shelter use
• Categories of meds
  • Vaccinations
  • Parasiticides- internal and external
  • Anti-infectives- antibiotics, antifungal, antiviral
  • Anti-nausea
  • Anesthetics, sedatives
  • Analgesics- NSAIDs, opioids, local anesthetics, other
  • Anxiolytics
  • Topical- shampoos, ophthalmic, otic, wounds/skin lesions
  • Other- appetite stimulants, sedatives, emergency, steroids, antihistamine
• Protocols
  • Intake- including vaccination and deworming
  • Common conditions- CIRDC, FeURI, Diarrhea, injuries +/- infection, pain, anesthesia and analgesia
• Tips, practical considerations and good practices
  • Dosing charts
  • Logistical considerations
  • Adverse effects plan
  • Large scale cases- be ready to flex your normal plan!
What’s on your shelf?
Developing Protocols for Therapeutic Choice and Use in Animal Shelters
May 24, 2018

Aleisha Swartz, DVM
Outreach Veterinarian
UW-Madison Shelter Medicine Program
Who is UWSMMP

Shelter Support

University of Wisconsin Shelter Medicine Program offers a wide range of support services to shelters, including both remote and on-site shelter consultations, outbreak assistance, and diagnostic testing.

uwsheltermedicine.com
Veterinary Fellowship Program

Fellowship program

The Fellowship Program was created to build a learning community that provides training and support for veterinarians working directly in shelters.

Interested in becoming a Fellow? Check back in the spring when we post details and application to recruit for the upcoming fellowship year.

Our Fellowship program is a joint effort between our Shelter Medicine program at the University of Wisconsin-Madison and the University of California-Davis Koret Shelter Medicine Program. Working together we deliver
Outline

• Needs of shelter
• Types of medication
• Example protocols
• Practical considerations and tips
Top 3 ways to reduce infectious disease

1. Pay close attention to animal well-being
2. Limit stressors
3. Reduce exposure
Key concept: Understanding your toolbox

- Management / Capacity
- Vaccination / Prevention
- Recognition / Monitoring / Testing
- Separation
- Treatment
- Sanitation
- Housing
Veterinary Oversight

• Know state/ local practice act and regulations
  • Vary significantly state to state

• Practice of veterinary medicine

• Must have veterinarian oversight
Medication Needs in a shelter

• Preventive
• Anesthesia/surgery
• Therapeutic for specific conditions
• Keep it simple
Decision Fatigue

• Many options
• Rapidly changing
• New products continually on the market - need to stay informed
• Simplify

The paradox of choice: Too many good options?
Characteristics of ideal medication (in a shelter)

- Safety
- Efficacy
- Inexpensive
- Ease of administration-route, timing
- Simple product formulations/ SKUs
- Multiple uses
- Long shelf life
How Can Drugs be Administered?

• Injectable - single or multi-dose vials. IV, IM, or SQ.

• Topical - ointments, creams, pastes, gels, solutions, shampoos.

• Oral - Includes tablets, capsules, and suspensions.

• Rectal - not very common but is sometimes necessary.

• Shelter Capacity
Categories of medications

• Vaccinations
• Parasiticides- internal and external
• Anti-infectives- antibiotics, antifungal, antiviral
• Anesthetics/ sedatives
• Analgesics- NSAIDs, opioids, local anesthetics, other
• Behavioral medications
• Anti-nausea
• Topicals
  • Ear, eye, skin, therapeutic shampoos/rinses
• Other
Vaccinations

**Cats**
- MLV subcutaneous FVRCP

**Dogs**
- MLV subcutaneous DHP
- Intranasal Bordetella, parainfluenza, +/-CAV2

Rabies vaccination in compliance with local/state laws
Parasiticides- capcvet.org
Parasiticides- internal

Commonly used products

• Pyrantel Pamoate (Strongid) one dose
• Fenbendazole (Panacur)- 3 day course


Roundworms, *Toxocara canis*

Photos from www.CAPCvet.org
Parasiticides - internal

Ponazuril
- Marquis paste - equine formulation
- Coccidio-cidal
- Juveniles

Coccidia spp., www.capcvet.org
Parasiticides- internal

Ponazuril

- Dilution recipe and dosing available on UW/UCD website library uwsheltermedicine.com

**DOSING CHART:**

<table>
<thead>
<tr>
<th>Weight</th>
<th>Ponazuril (mls)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 1 lb</td>
<td>0.25 mls</td>
</tr>
<tr>
<td>2 lbs</td>
<td>0.50 mls</td>
</tr>
<tr>
<td>3 lbs</td>
<td>0.75 mls</td>
</tr>
<tr>
<td>4 lbs</td>
<td>1.00 mls</td>
</tr>
<tr>
<td>5 lbs</td>
<td>1.25 mls</td>
</tr>
<tr>
<td>6 lbs</td>
<td>1.50 mls</td>
</tr>
<tr>
<td>7 lbs</td>
<td>1.75 mls</td>
</tr>
<tr>
<td>8 lbs</td>
<td>2.00 mls</td>
</tr>
<tr>
<td>9 lbs</td>
<td>2.25 mls</td>
</tr>
<tr>
<td>10 lbs</td>
<td>2.5 mls</td>
</tr>
<tr>
<td>Greater than 10 lbs</td>
<td>Weight in lbs x 0.25 mls = Dose in mls</td>
</tr>
</tbody>
</table>
Parasiticides - internal

**Fenbendazole (Panacur)**
- 5 days for Giardia
- 3 days for whipworms in dogs

Whipworm, Trichuris spp.  
Giardia Trophozoite
Paraciticides - internal

Dipylidium caninum (tapeworms)
• May want to empirically deworm if seen often -> FLEAS
• Several options
  • Topical
    • Often more costly, may be applying other topicals
  • Oral
    • Praziquantel (Droncit and part of Drontal)
      • One tablet size. Tablets large, may need to give multiple if large cat.
    • Epsiprantel (Cestex)
      • May be less costly, more tablet sizes. Tablets are coated.
Parasiticides - Heartworms

- MANY products, most combination
- CAPC recommendation is for all dogs to be on HWP year round
  - Not all are microfilaricidal if treating HW positive dogs
Parasiticides - ectoparasites
Parasiticides- ectoparasites

• Topical or Oral
• Check labels- which parasites are covered
• Newer products to note- Isoxazolines
  • Fleas, ticks, demodex, sarcoptes, otodectes!
## Parasiticides - ectoparasites

### ISOXAZOLINES AT A GLANCE\(^1\-^5\)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Species</th>
<th>Product</th>
<th>Minimum Age</th>
<th>Minimum Body Weight</th>
<th>Dosing Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afoxolaner</td>
<td>Dog</td>
<td>Chew</td>
<td>8 weeks</td>
<td>4 lb (1.8 kg)</td>
<td>1 month</td>
</tr>
<tr>
<td>Fluralaner</td>
<td>Dog</td>
<td>Chew</td>
<td>6 months</td>
<td>4.4 lb (2 kg)</td>
<td>12 weeks*</td>
</tr>
<tr>
<td>Sarolaner</td>
<td>Dog</td>
<td>Chew</td>
<td>6 months</td>
<td>2.8 lb (1.3 kg)</td>
<td>1 month</td>
</tr>
<tr>
<td>Lotilaner</td>
<td>Dog</td>
<td>Chew</td>
<td>8 weeks</td>
<td>4.4 lb (2 kg)</td>
<td>1 month</td>
</tr>
<tr>
<td>Fluralaner</td>
<td>Dog</td>
<td>Topical solution</td>
<td>6 months</td>
<td>4.4 lb (2 kg)</td>
<td>12 weeks*</td>
</tr>
<tr>
<td>Fluralaner</td>
<td>Cat</td>
<td>Topical solution</td>
<td>6 months</td>
<td>2.6 lb (1.2 kg)</td>
<td>12 weeks*</td>
</tr>
</tbody>
</table>

Chart available at Clinician’s Brief
Parasiticides - Combination products
Systemic Anti-infectives- bacterial

• Considerations
  • Common indications in your shelter
  • Oral or parenteral
  • Suspension, tablet, capsule
  • Frequency of use and product sizes
  • Responsible use
Systemic Anti-infectives- bacterial

• No one silver bullet
• Good choices
  • Doxycycline- respiratory disease
  • Cephalosporin- skin disease, wounds
  • Enrofloxacin- respiratory disease
  • Metronidazole- diarrhea
  • Penicillin G injectable- wounds, other
  • Convenia?
  • Others- clindamycin, amoxicillin/clavulanate
Systemic Anti-infectives- fungal

• Ringworm/dermatophytosis
  • Itraconazole
  • Terbinafine

• Yeast dermatitis
Systemic Anti-infectives- - viral

- Most viral treatment is supportive and non-specific
- Antibiotics indicated for secondary bacterial infections.
- What about famcyclovir?
- FOCUS ON PREVENTION for HERPES!
Anti-emetics

- Maropitant (Cerenia)
  - Injectable and oral
  - Cats and dogs
  - Once a day
- Anzemet (Dolasetron)
- Metoclopramide (Reglan)
Anesthetics and sedatives

www.aspcapro.org/spayneuter
Analgesics

• Opioids
  • Injectable and transmucosal
  • Long acting formulations

• NSAIDs
  • Many options
  • Injectable available?
  • Cats and/or dogs
  • Consider dosing, sizing, cost
Behavioral Medications

• Anxiolytics
  • Shelter needs- fast acting, safe, effective

• Trazodone

• Others- clomipramine, fluoxetine, benzodiazepines, gabapentin.

• Free ASV Webinar by Dr. Sara Bennett
  www.sheltervet.org

Medication alone NOT solution
Topical Therapy

- Shampoos
- Rinses
- Ophthalmic
- Otic
Miscellaneous

• Appetite Stimulants
  • Mirtazipine
  • Entyce

• Antihistamines
  • Diphenhydramine

• Glucocorticoids

• Emergency
  • Atropine
  • Epinephrine
  • Doxapram
Protocols

• Intake/ preventive
  • including vaccination and deworming
• Common conditions
  • CIRDC
  • Feline URI
  • Anesthesia, analgesia, sedation
  • Anxiety
  • Diarrhea
  • Mild Injuries/ wounds
  • Ringworm
  • Parvo
AN OUNCE OF PREVENTION IS WORTH A POUND OF CURE

BENJAMIN FRANKLIN
Intake Protocol- Vaccination

• Dogs- SQ MLV DA2P
  • IN Bordetella, CPiV,
    +/-CAV2
  • As young as 3 weeks
• Cats- SC, MLV FVRCP
• Before or immediately on intake for every cat/ dog
  > 4 weeks of age
• Nearly no exceptions!
• Handling issues
Example Feline Intake Protocol - Parasite Treatment

• GOAL- treat most common internal and external parasites, especially those with zoonotic potential

• Good option:
  • Selamectin (Revolution) topically
    • Labeled for use in > 8 weeks of age
    • Safety testing included pregnant and lactating
  • Widely used in shelters
  • Administer pyrantel 2 weeks later
Example Kitten Intake Protocol - Parasite Treatment

• 2-4 weeks of age
  • Manual flea removal/bathing
  • Ponazuril - repeat in 2 weeks
  • Pyrantel - repeat every 2 weeks until 8 weeks

• > 4 weeks of age
  • Selamectin
    • (off label < 8 weeks)
  • +/- Nitenpyram (Capstar)
  • Ponazuril - repeat 2 weeks
  • Pyrantel 2 weeks after selamectin
Canine Intake Protocol - Parasite Treatment

• Intestinal parasites
  • Pyrantel pamoate orally (hooks, rounds)
    • Repeat in 2 weeks
  • Ponazuril for puppies as for kittens (coccidia)

• External parasites
  • Oral or Topical flea/tick product
    • Many options
    • Repeat per label

• Heartworm preventive
  • Macrocyclic lactone product
  • Combination products
CIRDC (aka Kennel Cough or ITB)

- Multiple bacterial and viral pathogens play a role
  - co-infection common
- Treatment is supportive and symptomatic
- No ONE drug of choice
- Separate sick and healthy!
CIRDC (aka Kennel Cough or ITB)

- Antibiotics commonly indicated in shelter setting
  - Good first choice:
    - Doxycycline, PO q. 24 hrs
      - Efficacy against \textit{Bordetella} and \textit{Mycoplasma}
  - Less effective choices
    - Cephalosporins, including cefovecin
    - Amoxicillin/ clavulanate
    - Except...
CIRDC (aka Kennel Cough or ITB)

- How long to treat?
- Monitor and be prepared to change antibiotics if not responding!
- Rescue antibiotic
  - Enrofloxacin
- May need combination to increase spectrum
  - Secondary bacterial pneumonia
Other therapies

• Inhalational therapy?
  • Anecdotal, uncertain efficacy

• Cough Suppressants
  • Glucocorticoids?
  • Narcotic antitussives?
  • Expectorants?
Feline Upper Respiratory Infection
What we now know- Feline URI

- STRESS!
  - < 2 moves in first week
- Housing
  - > 8 sq. ft. per cat
Feline Upper Respiratory Infection

• Vast majority viral
  • Herpes, some calici
• Few primary bacterial
• Secondary bacterial infections occur.
  • Often gram negative

• May not need antibiotics!
  • Evaluate protocol
Feline Upper Respiratory Infection

• Doxycycline
  • First line antibiotic
  • Good coverage for most relevant pathogens
  • Once a day
• Considerations for use
  • Avoid tablets/capsules due to esophageal strictures
• Suspension
  • Avoid Compounded
  • Make in house, discard after 7 days
Feline Upper Respiratory Infection

• How long to treat?
  • Unknown
  • Monitor response
  • No set time
  • Discontinue when signs resolve
  • Adjust if not responding!
What if not responding?

- Good choice - Enrofloxacin
  - Once a day
  - Dosing different than dogs, 5 mg/kg only
  - Many secondary are gram negative
  - Pradofloxacin similar - liquid oral formulation

- Other option
  - Azithromycin

- What about cefovecin (Convenia)?
Feline URI- Supportive Care

• Pain medication!
  • Some cats/kittens with URI seem reluctant to eat or swallow
  • Ulceration severely painful

• Hydration support

• Appetite stimulants?
Gastrointestinal Disease

• Very common in shelters
• Cause can be minor or severe
• Close monitoring, recognition and response essential
• Testing when indicated

• Goal
  • Maintain hydration
  • Reduce fluid loss - vomiting and/or diarrhea
  • Treat underlying cause when possible
Diarrhea- nonspecific treatments

• Metronidazole
  • Antibiotic and anti-inflammatory
  • Neurotoxicity at higher doses
• Probiotics
  • Considerations
• Don’t forget intestinal parasites and quality diet!
Intestinal parasite summary

- Fenbendazole (Panacur) - rounds, hooks, whips, giardia (+ metronidazole)
- Pyrantel (Strongid / Nemex) - rounds, hooks
- Pyrantel + febantel + praziquantel (Drontal Plus-dogs) - rounds, hooks, whips, tapes
- Praziquantel/Epsiprantel (Droncit/Cestex) - tapes
- Ponazuril (Marquis) – coccidia
- Milbemycin/moxidectin - rounds, hooks, whips
Parvo treatment protocol

New Protocol Gives Parvo Puppies a Fighting Chance When Owners Can’t Afford Hospitalization

By Carol Borchert
September 2012

Canine parvovirus is a serious and often fatal viral illness that most commonly affects puppies, though unvaccinated adult dogs can be infected as well. While treatment for parvovirus is available, it can be cost prohibitive for many families. Now, a new protocol developed at the Colorado State University Veterinary Teaching Hospital may help save “parvo puppies” and give their families a chance to give their dogs a healthy life.

“Parvovirus is one of the most common and deadliest viruses that unvaccinated dogs tend to get,” said Dr. Lauren Sullivan, an Assistant Professor in the Department of Clinical Sciences and a veterinarian with the Critical Care Unit at the Veterinary Teaching Hospital. “While a vaccine is available, puppies can be exposed to the disease before their vaccinations are complete, or if they haven’t received puppy wellness care due to their owner’s financial limitations.”

Parvovirus, which is spread through exposure to feces from infected dogs, has a wide range of symptoms including lethargy, vomiting, fever, and diarrhea. It primarily impacts the gastrointestinal tract and the circulatory system, where it suppresses the bone marrow and causes the white blood cell count to drop. Veterinary care focuses on supporting the puppy with IV fluids and antibiotics, and close monitoring, while the puppy weatheres the viral storm. Without intensive veterinary intervention, parvovirus is almost always fatal due to dehydration and/or a severely compromised immune system.

Intervention, while effective, requires inpatient care ranging from $1,500 to $3,000 – a cost some owners simply can’t afford. Euthanasia often becomes the only other option for severely affected dogs.
Hypersensitivity Reactions and Anaphylaxis

- Medications/vaccinations have the potential to cause hypersensitivity reaction
- Classic treatment
  - Glucocorticoid and diphenhydramine- mild
- Anaphylaxis
  - Low- dose epinephrine
  - IV Fluids if shock
Canine Dermatitis Protocols

- Superficial pyoderma common regardless of cause
- Ectoparasites common cause
  - Fleas
  - Demodex
  - Scabies
- Diagnostic testing- skin scrape, cytology, woods lamp, clinical exam
- Example protocol
  - Antimicrobial shampoo- chlorhexidine +/- anti-fungal
  - Oral Isoxazoline- nexguard, bravecto, simparica
Anesthetic protocols- spay/neuter

- ASPCA (formerly Humane Alliance) great resource
  - Protocols including videos available online free
  - On-site training- scholarships available for veterinarians.
- Multi-modal anesthesia
  - Pre-med with sedative and opioid
  - Rapid induction
  - Analgesia
  - Mindful of patient stress

www.aspcapro.org/resource/spayneuter-clinic-drug-charts-logs
Sample Dog anesthetic protocol

- Pre-med - IM acepromazine/hydromorphone (or morphine)
- Induction - IV Ketamine/Midazolam
- Maintenance - ET tube and isoflurane
- Analgesia - meloxicam
Sample Cat anesthetic protocol

- Pre-med and induction combined
- Combination of IM tiletamine-zolazepam/ butorphanol/ dexmedetomidine
- Meloxicam- low dose
- Fluids PRN
Canine Anxiety and Kennel Stress

• Observations
  • Signs consistent with fear and distress
  • Repetitive behaviors
  • Frustrated behaviors

• Assessment/ working diagnosis
  • Kennel stress, generalized anxiety, fear, barrier frustration

• Treatment
  • Environmental/ enrichment
  • Medical therapy
Canine Anxiety and Kennel Stress

• Medical therapy for anxiety
  • Short term
    • Trazodone: 3-4 mg/kg PO q 12 hrs
      • Fast acting
      • Good safety profile
      • Mild sedative effects
  • Long term
    • Fluoxetine: 1-2 mg/kg PO q 24 hrs
      • Takes 4-6 weeks to get full effect
    • Other options gabapentin, clonidine
• MONITOR and ADJUST
Summary- what’s on the shelf?

• Vaccinations- DHP/ Bordetella/CPiV, FVRCP
• Parasiticides- hooks, rounds, coccidian, fleas, ticks, heartworms, whips, tapes, giarda
  • Pyrantel, ponazuril, fenbendazole, flea/tick/ HW
• Anti-infectives
  • Antibiotics – doxycycline, cephalosporin, enrofloxacin, +/- clindamycin, convenia, metronidazole
  • Antifungal- itraconazole/terbinafine
  • Antiviral- PORTALS/PREVENTION!
• Anti-nausea- Cerenia injectable
• Anesthetics, sedatives- ASPCA Protocols
• Analgesics- One NSAID injectable and oral, opioid or two of choice
• Anxiolytics- Trazodone
• Topical- shampoos, 1-2 ophthalmic, 1 otic, 1 general topical
• Other- appetite stimulants, gluocorticoid, antihistamine, emergency
Tips and Best Practices

• It is critical to write prescriptions correctly, both on medication labels and on treatment sheets.

• Each direction should include the name of drug to be given, the amount of drug to be given, the route of administration, and the frequency.

• Good example: Enrofloxacin (22.7mg/mL) - Give 0.5 mL IV q24h x 5d.
Tips and Best Practices

• Keep things simple
• Use dosing charts
• Consistent therapies
• Monitor response to treatment
• Train Staff
• Track success
• Be ready to be flexible
Thank you
For more information

www.uwsheltermedicine.com
Thank you!