Staphylococcus pseudintermedius,

Organisms:

Canine superficial bacterial folliculitis (superficial pyoderma)

Recommended Treatment:

• Oral antimicrobial recommendation when warranted - Use one of the following for 3-7 days (listed in order of preference):
  1) Amoxicillin-clavulanic acid 12.5-25 mg/kg PO q12h
  2) Trimethoprim-sulfonamide 15-30 mg/kg PO q12h
  3) Clindamycin 5.5 mg/kg PO q12h

Topical preparations for 5-7 days or as directed on label

Antimicrobial Resistance Considerations:

• Consider antimicrobial therapy if clinical signs persist for 10 days or signs of systemic illness or pyrexia develop.
• Antimicrobial recommendation when warranted - Use one of the following for 5-7 days listed in order of preference:
  1) Cefazolin 20-22 mg/kg IV single dose 30-60 min prior to procedure
  2) Marbofloxacin 2.75-5.5 mg/kg PO q24h
  3) Azithromycin 5-10 mg/kg PO q24h

Feline Upper Respiratory Tract Infection (URTI)

Organisms:

• 80% of feline URTI caused by viruses
• Viral: Feline herpesvirus type-1 (FHV-1), calicivirus
• Bacterial: Bordetella bronchiseptica, Chlamydia spp., Mycoplasma spp.

Antimicrobial Resistance Considerations:

• Inappropriate antimicrobial use for this condition may contribute to antimicrobial resistance.
• Recommended Treatment:
  1) Clindamycin or cephalosporin

Canine Infectious Respiratory Disease Complex (CIRD)

Organisms:

• Viral: Canine adenovirus 2, canine parainfluenza virus, canine coronavirus, canine influenza virus
• Bacterial: Pasteurella multocida, Staphylococcus spp., Streptococcus spp.

Antimicrobial Resistance Considerations:

• Oral antimicrobial recommendation when warranted - Use one of the following for 3-7 days (listed in order of preference):
  1) Amoxicillin 11-22 mg/kg PO q8h and enrofloxacin 5-20 mg/kg (5 mg/kg cat) PO q24h
  2) Doxycycline 5 mg/kg PO q24h
  3) Enrofloxacin 5-10 mg/kg PO q24h

Bacterial Abscess

• A common polymicrobial infection involving skin, subcutaneous, and internal spaces
• Can occur as a complication of trauma, surgery, or other infectious processes

Recommended Treatment:

• Oral antimicrobial recommendation when warranted - Use one of the following for 3-7 days (listed in order of preference):
  1) Amoxicillin-clavulanic acid 12.5-25 mg/kg PO q12h
  2) Clindamycin 5.5-10 mg/kg PO q12h
  3) Trimethoprim-sulfonamide 15-30 mg/kg PO q12h

Dental prophylaxis

Organisms:

• Oral flora including both aerobes and anaerobes
• Aerobic and anaerobic bacterial species may be different

Antimicrobial Resistance Considerations:

• Inappropriate antimicrobial use for this condition may contribute to antimicrobial resistance.
• Recommended Treatment:
  1) Doxycycline or cephalosporin

Dental extractions

Organisms:

• Various aerobes and anaerobes

Antimicrobial Resistance Considerations:

• Inappropriate antimicrobial use for this condition may contribute to antimicrobial resistance.
• Recommended Treatment:
  1) Oral antibiotic therapy

Dental Abscess

Organisms:

• Anaerobes frequently present in combination with other bacteria
• Polymicrobial infection common

Antimicrobial Resistance Considerations:

• Consider antimicrobial therapy for patients with a history of recent or recurrent antimicrobial use.
• Oral antibiotic therapy

Pneumonia

Organisms:

• E. coli, Pasteurella, Aerococcus viridans, Staphylococcus spp., Streptococcus spp., Strep. zooepidemicus, Mycoplasma spp., Chlamydia spp.

Antimicrobial Resistance Considerations:

• Inappropriate antimicrobial use for this condition may contribute to antimicrobial resistance.
• Recommended Treatment:
  1) Cefazolin 20-22 mg/kg IV single dose 30-60 min prior to procedure
  2) Marbofloxacin 2.75-5.5 mg/kg PO q24h

Oral antimicrobial recommendation - Use one of the following (listed in order of preference):

• Amoxicillin-clavulanic acid 12.5-25 mg/kg PO q12h
• Azithromycin 5-10 mg/kg PO q24h
• Marbofloxacin 2.75-5.5 mg/kg PO q24h

Pre/probiotic antibiotics for routine procedures

• Antibiotics not warranted for routine surgical procedures
• Antibiotics used to prevent infection only justified in cases with a high likelihood of bacterial infection

• Sterile technique and proper tissue handling should eliminate the need for prophylactic antibiotics in orthopaedic procedures, arthroscopy, and most other sterile procedures
Testing – Minimum Inhibitory Concentration (MIC)

An antimicrobial drug is serially diluted by two-fold in medium and is reported in mg/L. The MIC is the lowest concentration of drug that inhibits bacterial growth in vitro. The MIC is used to categorize the bacterial isolate as susceptible or resistant to a specific antimicrobial agent.

Communicating MIC and Susceptibility (C&S) Results

Testing – Zone Diameter

Drug impregnated disks are incubated with the bacterial isolate on agar plate and a zone of inhibition around the disk is measured. The measurement is used to categorize the bacterial isolate as susceptible or resistant. The zone diameter (ZD) measurement is not reported.

Interpretive Categories

Susceptible (S): Predicts the likely clinical efficacy of the drug
Intermediate (I): May be reduced clinical efficacy, however if the drug concentrations at the site of infection, or the dose or frequency can be increased, clinical efficacy may be seen - it also allows for laboratory test variability
Resistant (R): Predicts the likely clinical failure of the drug due an acquired resistance mechanism or because the drug cannot reach the appropriate concentration needed in the animal species

What is a breakpoint?

The MIC or ZD value used to categorize a bacteria as susceptible, intermediate or resistant. For example, if the bacteria has an MIC of 1 mg/L, and the breakpoint for susceptibility is 2 mg/L, we would classify the bacteria as susceptible to that drug. Conversely, if the bacteria had an MIC of 8 mg/L and the breakpoint for resistance was 4 mg/L, we would classify the bacteria as resistant to that drug.

Breakpoints are developed by evaluation of pharmacokinetics, pharmacodynamics and clinical efficacy studies, if available. This analysis will also provide an estimation of clinical use.

What is a breakpoint? (continued)

Unfortunately due to the number of veterinary species, bacteria and drugs, we lack breakpoints for many animal/bacteria/drug combinations. Lack of breakpoints leads to significant stewardship challenges in veterinary medicine.

Resistances types

Intrinsic antimicrobial resistance is present when a microorganism is naturally resistant to an antimicrobial agent.

Acquired antimicrobial resistance occurs when a microorganism adapts over time to an antimicrobial agent.

Clinical antimicrobial resistance is a term used when the antimicrobial agent concentration at normally used doses is insufficient to kill the microorganism. This is not due to the organism's ability to resist the agent but rather the inability to reach therapeutic concentrations of the medication in the animal.

Communication Strategies for Talking with Clients about Antimicrobials

Explain why antibiotics are not needed

-“Your pet has allergies to grass and tree pollen, so antibiotics will not make her feel better faster.”

-“Your cat has an upper respiratory infection with a virus, so antibiotics will not help fight the infection.”

Tips:

- Owners are less likely to expect antibiotics for a “cold” than they are for “bronchitis”.

- Combine positive treatment recommendations that will help their pet feel better while explaining why antibiotics are not necessary.

Explain risks associated with inappropriate antibiotic use

-“Your cat is on multiple medications for his heart disease and adding another medication increases the risk of a negative drug interaction that could harm him. We should only add another medication to his treatment plan if truly necessary, and in this case his signs are that to a virus so an antibiotic will not help.”

-“You don’t skin condition is due to flea bites and will not improve with antibiotics. If we use antibiotics today when they are unnecessary, it may lead to them being ineffective in the future if he develops a condition that does need antibiotics.”

Explain provide positive treatment recommendations

-“Giving your dog penicillin medication (cephradin) and ensuring he rests will help him feel better.”

- “A warm humid room will soothe his chest and help him breathe easier.”

Explain contingency and follow up plan

-“If she is not better in 3 days, call the clinic and we will reassess whether other treatments may be needed.”

-“If your pet stops eating or becomes very tired, call us so we can reexamine him.”

Delayed antibiotic prescriptions

-“Your cat has an upper respiratory tract infection that will likely clear on its own in the next 10 days. If his symptoms have not resolved in 10 days, or if he gets worse, call and we will reexamine him.”

-“Your cat has an upper respiratory tract infection that will likely clear on its own in the next 10 days. Just in case it doesn’t, I have put an antibiotic prescription into his record. Call us in 10 days if he still has symptoms, or sooner if he gets worse, and we’ll have the medicine ready for pick up.”

Benefits of understanding and discussing C&S testing

- “A more thorough understanding of what culture and susceptibility results mean and what the values are based on allows veterinarians to communicate clearly with owners why this testing method is necessary along with setting appropriate expectations on how results will be used.

Benefits of understanding and discussing C&S testing (continued)

- Clear and effective communication prior to performing C&S testing and after receiving results will improve client understanding of testing and interpretation limitations along with the potential need for adjustments to the treatment plan. By laying this groundwork early, client compliance and improved patient outcomes are expected.

Benefits of understanding and discussing C&S testing (continued)

- Educating clients has the added benefit of increasing familiarity and knowledge regarding antimicrobial resistance in the general population. This will reinforce the messaging human medical and dental professionals are providing to their patients.

Abbreviations:

C&S – culture and susceptibility
CBC – complete blood count
MDR – multidrug resistance
PO – by mouth
spp. – species