Antibacterial use in our practice

The antibiotic guardian(s) of this practice is/are:

ANTIBIOTIC GUARDIAN

PROTECT ME

P rescribe only when necessary

- Consider non-bacterial disease (e.g. viral infection, nutritional imbalance, metabolic disorders)
- Remember that some bacterial diseases will self-resolve without antibacterials
- Offer a non-prescription form (see box bottom right)

R educe prophylaxis

- Perioperative antibacterials are NOT a substitute for surgical asepsis
- Prophylactic antibacterials are only appropriate in some immunocompromised patients

O ffer other options

- Consider therapeutic alternatives (lavage and debridement of infected material, cough suppressants, fluid therapy, nutritional modification)
- Using topical preparations reduces selection pressure on resident intestinal flora (the microbiome)
- Use effective hygiene techniques and antiseptics to prevent infections

T reat effectively

- Consider which bacteria are likely to be involved
- Consider drug penetration of the target site
- Use the shortest effective course and avoid underdosing
- Ensure compliance with appropriate formulation and provide clear instructions

E mploy narrow spectrum

- Unnecessarily broad-spectrum antibacterials could promote antibacterial resistance
- The use of narrow-spectrum antibacterials limits effects on commensal bacteria
- Use culture results to support de-escalation (switching to a narrower spectrum antibacterial)

C ulture appropriately

- A sample for culture should be collected **before** starting antibacterial therapy wherever possible
- Culture is essential when prolonged (>1week) treatment courses are anticipated, when resistance is likely (e.g. hospital acquired infections) and in life-threatening infections
- If first-line treatment fails, do not use another antibacterial without supportive culture and sensitivity results (**avoid cycling antibacterials**)

T ailor your practice policy

- A customized practice policy can guide antibacterial selection to address the bacterial infections and resistance patterns that you encounter, minimizing inappropriate use
- Complete the tick boxes in this poster to highlight **your** practice's first-line approach to each condition

M onitor

- Track and record culture profiles and update your practice policy accordingly
- Monitor for preventable infections (e.g. postoperative) and alter practices if needed
- Audit your own antibacterial use, particularly of critically important antibacterials (fluoroquinolones/cefovecin), e.g. using mySavsnet AMR

E ducate others

- Share this important message to reduce the threat from multi-resistant strains of bacteria and improve the health of pets and people

BSAVA British Small Animal Veterinary Association · Small Animal Medicine Society · mySavsnet AMR

6957PU8518

Select which antibacterials your practice uses in the boxes below

Culture essential to ensure effective therapy

Culture strongly advised to guide therapy (where possible)

Use your smartphone and a QR code reader to access extra information. Alternatively visit: bsavalibrary.com/protectme

GASTROINTESTINAL INFECTIONS

Antibacterials are not indicated for:
- Acute vomiting
- Acute diarrhoea (including acute haemorrhagic cases)
- Pancreatitis
- Most gastric *Helicobacter* infections
- Most *Campylobacter, Salmonella, Clostridium perfringens* or *C. difficile* infections
- Chronic diarrhoea (except as part of a treatment trial)

Acute diarrhoea with systemic signs indicating actual (or risk of) bacteraemia or sepsis:

Suspected parvovirus
- ☐ Amoxicillin/clavulanate

If acute diarrhoea with systemic signs
- ☐ Amoxicillin/clavulanate
- ☐ Cefalexin

Trial treatment of chronic diarrhoea/chronic enteropathy ('inflammatory bowel disease'):
- ☐ Metronidazole
- ☐ Tylosin
- ☐ Oxytetracycline

Prior to antibacterial trial, perform appropriate diagnostics and consider other treatments including *Giardia* treatment, dietary change or prednisolone trial.
Trial antibacterial treatment should not exceed 3–4 weeks

Cholangitis/cholangiohepatitis:
- ☐ Amoxicillin/clavulanate
- ☐ Ampicillin
- ☐ Cefalexin
- ☐ Add metronidazole (dogs)

Treat for 2–4 weeks

URINARY TRACT INFECTIONS

Antibacterials are not indicated for:
- Feline idiopathic cystitis (FIC)
- Feline struvite urolithiasis and canine non-struvite urolithiasis
- Urinary incontinence
- Subclinical bacteriuria (canine or feline)
- Juvenile canine vaginitis

Uncomplicated, symptomatic, canine urinary tract infection (cystitis):
- ☐ Amoxicillin (± clavulanate)
- ☐ Trimethoprim/sulphonamide

Treat for 7–10 days

Complicated canine or feline urinary tract infection

Reinfection, recurrent and persistent urinary tract infections:
- ☐ Amoxicillin (± clavulanate)
- ☐ Trimethoprim/sulphonamide

If reinfection occurs, use the SAME antibacterial if previously successful
If recurrent/persistent infection, modify therapy on basis of sensitivity data
Review predisposing factors (e.g. urolithasis, anatomical abnormalities)

Prostatitis (entire males):
- ☐ Fluoroquinolones (high dose – see QR code)
- ☐ Trimethoprim/sulphonamide

Treat for 4–6 weeks + medical/surgical castration

Urolithiasis (≠ crystalluria):
Canine struvite urolithiasis (for dissolution)
- ☐ Amoxicillin (± clavulanate) until resolution of urolithiasis confirmed

Dietary modification and urine acidification alongside treatment
Consider surgical removal

Suspected pyelonephritis:
- ☐ Amoxicillin/clavulanate
- ☐ Fluoroquinolones
- ☐ Trimethoprim/sulphonamide

Treat for 2–4 weeks

EYE INFECTIONS

Canine conjunctivitis:
- ☐ Fusidic acid
- ☐ Chlortetracycline

Treat for 5–7 days

Feline conjunctivitis:
- ☐ Chlortetracycline
- ☐ Fusidic acid

Treat for 5–7 days

Feline-specific disease:
Chlamydophila felis
- ☐ Systemic doxycycline (amoxicillin/clavulanate in pregnant queens and kittens)

Treat for 21–28 days

Mycoplasma felis
- ☐ Topical tetracycline

Uncomplicated corneal ulceration:
- ☐ Topical chloramphenicol

Complicated corneal ulceration (infectious keratitis):
Topical chloramphenicol AND
- ☐ Topical gentamicin
- ☐ Topical ciprofloxacin
- ☐ Topical ofloxacin

Treat until the corneal defect has re-epithelialized q4 hours for the first 48 hours – reduced once the destructive corneal process has stopped
Consider systemic antibacterial if, e.g. 'melting', corneal perforation, marked uveitis

Orbital abscessation/bacterial cellulitis:
- ☐ Amoxicillin/clavulanate
- ☐ Cefalexin and metronidazole
- ☐ Cefalexin and clindamycin

Treat for 2 weeks
Attempt drainage via most appropriate route, usually via mouth

SYSTEMIC INFECTIONS

Neutropenia:
- **Mild** (neutrophil count >1000/µl) – antibacterial NOT required
- **Moderate** (neutrophil count 500–999/µl) AND well

- ☐ Cefalexin
- ☐ Amoxicillin/clavulanate
- ☐ Trimethoprim/sulphonamide

Treat for 5–7 days
- **Severe** (neutrophil count <500/µl) AND/OR unwell
- ☐ Amoxicillin/clavulanate (OR cefuroxime) + fluoroquinolone

Septic peritonitis secondary to gastrointestinal leakage:
- ☐ Metronidazole + marbofloxacin
- ☐ Ampicillin + amikacin + metronidazole
- ☐ Amoxicillin/clavulanate + marbofloxacin

Initially intravenously then orally when clinical signs improve
Treat for 2 weeks following resolution of signs/abdominal effusion

Bacteraemia/sepsis (including peritonitis of non-gastrointestinal origin):
- ☐ Clindamycin + marbofloxacin
- ☐ Ampicillin + metronidazole + marbofloxacin
- ☐ Ampicillin + amikacin + marbofloxacin
- ☐ Amoxicillin/clavulanate + marbofloxacin

Initially intravenously then orally when clinical signs improve
Treat for 2 weeks following resolution of signs/abdominal effusion

ORTHOPAEDIC INFECTIONS

Discospondylitis:
- ☐ Cefalexin
- ☐ Amoxicillin/clavulanate
- ☐ Trimethoprim/sulfadiazine
- ☐ Clindamycin

Intravenously, if severe neurological compromise or signs of sepsis
Treat for minimum 8 weeks (based on clinical response)

Infective/septic arthritis:
- ☐ Cefalexin
- ☐ Amoxicillin/clavulanate

Treat for 4 weeks OR until synovial fluid neutrophils <3%

Osteomyelitis:
- ☐ Cefalexin
- ☐ Amoxicillin/clavulanate

Intravenously for first 2–3 days then orally
Treat for 6–8 weeks

ORAL INFECTIONS

Consider chlorhexidine mouthwash

Severe gingivitis and periodontitis:
- ☐ Amoxicillin/clavulanate
- ☐ Metronidazole
- ☐ Clindamycin (if periodontal bone infections)

Ulcerative stomatitis:
- ☐ Metronidazole

SKIN AND EAR INFECTIONS

Antibacterials are not indicated for:
- *Malassezia* dermatitis
- Non-specific skin problems (e.g. pruritus)

Bites and traumatic wounds:
- Debride and lavage
- If systemically well and not pyrexic:
  - ☐ Topical treatment with 2–4% chlorhexidine
- If systemically unwell and pyrexic

Systemic antibacterials based on cytology:
For cocci
- ☐ Clindamycin
- ☐ Cefalexin
- ☐ Amoxicillin/clavulanate
- ☐ Trimethoprim/sulphonamide

For rods
- ☐ Fluoroquinolones

Acute bite wound prophylaxis:
- ☐ Thorough flushing with saline or 2–4% chlorhexidine
- ☐ Amoxicillin/clavulanate (for 7 days)

Surface pyoderma (hot spots, intertrigo):
- Topical treatment ONLY
- ☐ 2–4% chlorhexidine
- ☐ Fusidic acid ± glucocorticoid
- ☐ Silver sulphadiazine (if rods)

Superficial pyoderma:
- Topical treatment ONLY is appropriate
- ☐ 2–4% chlorhexidine

If required:
- ☐ Clindamycin
- ☐ Cefalexin
- ☐ Amoxicillin/clavulanate
- ☐ Trimethoprim/sulphonamide
- Culture if rods are seen on cytology or there is a history of MRSP/MRSA or multiple prior antibacterial courses

Treat for minimum 3 weeks or 1 week beyond clinical cure
Repeat cytology to assess response
Use doses at top end of range for better skin penetration

Deep pyoderma:
- Whilst culture pending, systemic antibacterial therapy based on cytology as for superficial pyoderma
- ☐ Add topical treatment with 2–4% chlorhexidine

Treat for minimum 4–6 weeks or 2 weeks beyond clinical cure
Ideally repeat cytology

Otitis externa:
- Topical treatment ONLY
- No authorized products if ear drums not intact
- Use in-house cytology to guide drug choice and prognosis

If rods
- ☐ Framycetin
- ☐ Gentamicin
- ☐ Polymyxin B

If cocci
- ☐ Florfenicol
- ☐ Fusidic acid/framycetin
- ☐ Polymyxin B/miconazole

May combine with antiseptic ear cleaner
Treat until cytology is negative

Anal sac inflammation/engorgement without abscessation:
- Topical treatment ONLY
- Manual evacuation, flushing with chlorhexidine + packing with topical polypharmacy ear product containing aminoglycoside or florfenicol

Anal sac abscessation:
- ONLY if signs of cellulitis
- ☐ Trimethoprim/sulphonamide
- ☐ Amoxicillin/clavulanate

RESPIRATORY INFECTIONS

Antibacterials are not indicated for:
- Chronic bronchitis/allergic airway disease unless secondarily infected
- Canine sino-nasal disease

Canine infectious respiratory disease complex (Kennel Cough) and Feline upper respiratory tract infection (Cat Flu):
ONLY if clinical signs present >10 days and/or systemically unwell
- ☐ Doxycycline
- ☐ Amoxicillin/clavulanate

Treat for 7–10 days
Treat chronic cat flu for 1 week beyond clinical plateau

Pneumonia:
- ☐ Amoxicillin/clavulanate

For suspected *Bordetella/Mycoplasma*
- ☐ Doxycycline

If antibacterial exposure in preceding 4 weeks or if hospitalized for >48 hours prior to onset of respiratory signs (i.e. hospital-acquired infection)
- ☐ Fluoroquinolone + clindamycin

Treat for 4–6 weeks, based on C-reactive protein, or for 7–10 days beyond radiographic resolution

Pyothorax:
- ☐ Fluoroquinolone + amoxicillin (± clavulanate)
- ☐ Fluoroquinolone + clindamycin

Treat for 4–6 weeks (and beyond radiographic/ultrasonographic resolution)

SURGICAL USE

Antibacterials are not indicated for:
- Clean (elective surgery, no entry into hollow viscus) surgical procedures

Prophylactic (perioperative) antibacterials are appropriate:
- For prolonged clean surgery (>90 minutes) or surgery involving an implant
- For all surgery involving entry into a hollow viscus (e.g. gastrointestinal tract, urinary tract)
- Where there is an obvious break in asepsis causing contamination of the wound
- For all contaminated wounds or if there is a pre-existing infection
- For debilitated or immunosuppressed patients
- Where infections would be catastrophic (e.g. in CNS)

In most cases
- ☐ Amoxicillin/clavulanate
- ☐ Cefuroxime

Intravenously 60 minutes before the first incision, then every 90 minutes until the end of surgery
Where anaerobic involvement is highly likely:
- ☐ Add metronidazole

Do not continue antibacterials after surgery, unless there is a therapeutic indication as this will select for resistance

Therapeutic (postoperative) antibacterials are indicated:
- To treat a known bacterial infection
- When the risk of a postoperative infection developing is high due to contamination or major break in asepsis

MISCELLANEOUS INFECTIONS

Pyometra:
Antibacterials not required if stable and proceeding directly to OHE

Surgically managed:
- ☐ Amoxicillin (± clavulanate)
- ☐ Cefalexin + enrofloxacin

Treatment discontinued after surgery (unless septic peritonitis)

Medically managed:
Amoxicillin (± clavulanate)

Mastitis:
- ☐ Cefalexin
- ☐ Amoxicillin/clavulanate
- ☐ Trimethoprim/sulphonamide

Treat for 2–3 weeks or until offspring weaned (early weaning NOT advised)

Suspected *Mycoplasma haemofelis* (feline infectious anaemia):
- ☐ Doxycycline
- ☐ Marbofloxacin

Treat for 4 weeks

Suspected leptospirosis:
- ☐ Doxycycline
- ☐ Penicillin G
- ☐ Amoxicillin (± clavulanate)

Doxycycline is necessary to address renal colonization/carrier state
Treat for 2 weeks

Hepatic encephalopathy (HE):
Diet and lactulose should be first line therapies in the management of patients with HE
If symptomatic:
- ☐ Metronidazole (decreased dose)
- ☐ Amoxicillin
- ☐ Ampicillin

ADVERSE REACTIONS TO ANTIBACTERIALS

This list is not comprehensive.

Antimicrobial	Adverse effect	At risk group	Recommendation
Aminoglycosides	Nephrotoxicity	Dogs/cats with pre-existing renal disease, volume or electrolyte depletion	Avoid in at risk animals or when close monitoring is not available Do not exceed 7 days treatment duration Monitor urine for casts
	Ototoxicity	Cats	
Amoxicillin/ clavulanate (intravenous use)	Urticaria, hypotension Anaphylactoid reactions	Dogs under general anaesthesia	Caution with intravenous use in anaesthetized patients
Doxycycline or clindamycin	Oesophageal irritation ± stricture	Cats (>dogs)	Ensure administration with food or water
Enrofloxacin	Retinal degeneration leading to partial, temporary or total blindness	Cats	Alternative fluoroquinolones preferred in cats
Fluoroquinolones	Defective cartilage development leading to severe lameness	Young dogs	Avoid in growing animals
Metronidazole	Dose-dependent neurotoxicity	Dogs	Caution with higher doses
Penicillins	Immediate and delayed hypersensitivity reactions	Dogs/cats	Avoid in penicillin-sensitive animals/ owners
Potentiated sulphonamides	Keratoconjunctivitis sicca Hepatic necrosis (rare) Immune complex reactions (polyarthritis, anaemia, thrombocytopenia)	Dogs esp. Dobermanns, Samoyeds and Miniature Schnauzers	Avoid in specified breeds Monitor Schirmer Tear Test before and during use

DO NOT USE

Antibacterials with restricted use in human medicine (e.g. imipenem, linezolid, teicoplanin, vancomycin) should **not** be used in animals.

Highest priority critically important antibacterials

Fluoroquinolones (enrofloxacin, marbofloxacin, pradofloxacin, ciprofloxacin), and 3rd- and 4th-generation cephalosporins (cefovecin) should **only** be used when first-line antibacterials are inappropriate or ineffective.
If urgent treatment is required, then samples for culture and sensitivity testing should be submitted before starting these agents, and then therapy adapted.

First-line antibacterials

Limit the use of first-line antibacterials to times of genuine clinical need and avoid all unnecessary use.

Responsible antibacterial use under the Cascade

It is justifiable, on a case-by-case basis, to prescribe an antibiotic on the cascade **in the interests of minimizing the development of resistance**, particularly where culture and sensitivity data indicate that a particular antibiotic active substance is effective against a bacterial pathogen and where knowledge of pharmacokinetics indicates that the selected product is likely to be safe and effective for the animal species and condition being treated.

Use non-prescription forms. Available from the BSAVA Library and SAMSoc.org.

For further information on individual drugs and dosages, see *BSAVA Small Animal Formulary.*