- Consider non-bacterial disease (e.g. viral infection, nutritional imbalance, metabolic disorders)
- Some bacterial diseases will self-resolve without
- Offer a non-prescription form (see box bottom right) Perioperative antibiotics are **not** a substitute for

eplace with non-antibiotic **treatments**

- Lavage and debridement of infected material, fluid therapy, dietary management, cough suppressants and measures to address underlying conditions may negate the need for antibiotics
- Use topical preparations (ideally antiseptics) where possible to reduce selection pressure on intestinal flora (the microbiome)

ptimise dosage protocols

- Use the shortest effective course and avoid
- Treat until clinical resolution

reat effectively

- Consider which bacteria are likely to be involved Consider drug penetration of the target site (e.g. for prostatitis, osteomyelitis)
- Consider pharmacokinetics and drug interactions with concurrent medication
- Provide instructions, including demonstrations, on how to administer prescribed antibiotics

mploy narrow spectrum

- Use narrow-spectrum, rather than broad-spectrum, antibiotics to minimize resistance
- Avoid antibiotic combination therapy
- Use culture results to support de-escalation (switch to a narrower spectrum antibiotic)

onduct cytology and culture

- Use cytology to demonstrate bacterial involvement and an inflammatory response consistent with infection (e.g. intracellular bacteria)
- Collect a sample for culture before starting antibiotic therapy wherever possible
- Culture is essential when using prolonged (>1 week) treatment courses, where there are risk factors for resistance (e.g. healthcare associated infections, antibiotic treatment in the prior 60 days or multiple prior courses/repeated antibiotic use) and in lifethreatening situations

ailor your practice policy

- Discuss your practice's first-line antibiotic choice for each condition with your colleagues, complete the tick boxes in this poster and display it so your protocols are clear, including when the approach is to not prescribe an antibiotic
- Evaluate practice biosecurity and hand hygiene
- Practice preventative medicine (vaccination, parasite) prevention)

- Monitor for preventable infections (e.g. surgical site) infections) and alter practice protocols if needed
- Audit your own antibiotic use, particularly of EMA **Restrict** category antibiotics (fluoroquinolones/3rd generation cephalosporins), e.g. using RCVS Knowledge Audit tool

ducate others

- Promote awareness of AMR among staff and clients (use tools such as the owner education animation)
- Encourage return of leftover antibiotics for safe disposal









Antibiotic use in our practice

Select which antibiotics your practice uses in

Culture ESSENTIAL to ensure effective therapy

Cytology advised to guide therapy

resources to support medicating cats

Alternatively visit: bsavalibrary.com/protectme

GASTROINTESTINAL INFECTIONS

Antibiotics are not indicated for:

- Acute diarrhoea (including acute haemorrhagic (AHDS) cases) unless sepsis
- Campylobacter, Salmonella, Clostridium perfringens or C. difficile infections

Acute diarrhoea with signs of sepsis:

- Ampicillin or amoxicillin or cefalexin Amoxicillin/clavulanate

ONLY use metronidazole if fenbendazole AND environmental management

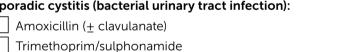
Chronic diarrhoea/chronic enteropathy ('inflammatory bowel disease'):

- Diagnostics and treatments including Giardia treatment, dietary management, measures to address dysbiosis (e.g. prebiotics, probiotics or faecal matter transplantation) and/or a prednisolone trial should be performed BEFORE an antibiotic trial
- The use of antibiotics for putative immunomodulatory or antiinflammatory effects is discouraged

Cholangitis/cholangiohepatitis (consult QR code):

- Amoxicillin/clavulanate
- Ampicillin
- Cefalexin
- Marbofloxacin OR enrofloxacin (dogs only)
- Treat for 2 weeks then reassess. Monitor liver enzyme activities/bilirubin

- Antibiotics are not indicated for:
- Feline idiopathic cystitis ■ Feline urolithiasis and canine non-struvite urolithiasis
- Urinary incontinence
- Subclinical bacteriuria (canine or feline) including animals with hyperadrenocorticism, diabetes mellitus or spinal cord injury
- Canine juvenile vaginitis





Treat for 3–5 days **Recurrent cystitis**

- Amoxicillin (<u>+</u> clavulanate)
- Trimethoprim/sulphonamide
- If recurrence, pending susceptibility testing use the SAME antibiotic for 3–5
- days if previously successful Review predisposing factors (e.g. urolithiasis, anatomical abnormalities) Treat for 7–10 days

Prostatitis (entire males):

- Trimethoprim/sulphonamide
- Fluoroquinolone (enrofloxacin 10 mg/kg IV q24h (dogs only) OR marbofloxacin 5 mg/kg) reat for 2–4 weeks AND perform medical/surgical castration

Urolithiasis (≠ crystalluria):

Canine struvite urolithiasis Amoxicillin (± clavulanate) until resolution of urolithiasis

Consider surgical removal

Acute pyelonephritis (consult QR code): Fluoroquinolone Trimethoprim/sulphonamide

ORAL INFECTIONS

Consider IV if signs of sepsis

Freat for 10−14 days

- Consider 0.12% chlorhexidine mouthwash or gels/pastes Antibiotics are not indicated for:
- Canine chronic ulcerative stomatitis
- Gingivitis/periodontitis ■ Feline chronic gingivostomatitis
- Fractured teeth ■ Tooth root abscess (unless facial cellutitis is evident) Dental procedures including tooth extractions
- Oral swabs usually grow oral commensals: culture fresh tissue





Conjunctivitis: Fusidic acid

- Chlortetracycline
- Chloramphenicol
- Treat for 5–7 days Cats: consider viral infection (e.g. feline herpesvirus type-1) or other ocular
- diseases (e.g. eyelid abnormalities) if not responding Dogs: primary bacterial conjunctivitis uncommon. Rule out underlying ocular diseases (e.g. keratoconjunctivitis sicca (KCS), allergic disease, eyelid abnormalities)

Feline-specific disease:

- Chlamydophila felis Systemic doxycycline (amoxicillin/clavulanate in pregnant queens and kittens)
- Treat for 21-28 days Mycoplasma felis Topical chlortetracycline
- Systemic doxycycline Treat for 21–28 days

Uncomplicated corneal ulceration (superficial corneal ulcers):

- Treat until the corneal ulcer has re-epithelialized
- Rule out spontaneous chronic corneal epithelial defects or perpetuating factors (e.g. KCS, eyelid abnormalities) if failing to heal

Complicated corneal ulceration/infectious keratitis (stromal

- corneal ulcer, keratomalacia): Topical chloramphenicol + gentamicin
- Topical chloramphenicol + ciprofloxacin Topical chloramphenicol + ofloxacin Treat until the corneal ulcer has re-epithelialized (q2–4h for the first 48 hours, q6-8h once destructive corneal process has stopped)
- Base initial antibiotic choice on cytology and adjust if required following susceptibility testing. Consider adding topical serum/plasma f corneal perforation
- Consider systemic antibiotic (amoxicillin/clavulanate)
- Orbital abscessation/bacterial cellulitis: Amoxicillin/clavulanate
- Cefalexin and metronidazole
- Cefalexin and clindamycin
- Treat for a minimum of 2 weeks, ideally based on susceptibility testing Attempt drainage via most appropriate route (based on advanced imaging of the orbit), usually via mouth (oral mucosa behind last molar)

LIFE THREATENING INFECTIONS

Use of antibiotics other than those listed should be based on

- susceptibility testing There is no universally accepted veterinary definition of sepsis, but it may be suspected in dogs and cats who are systemically unstable due to a presumptive
- or diagnosed bacterial burden, clinically this may manifest as: Refractory hypotension (systolic <90 mmHq) despite appropriate volume resuscitation ■ Hypoglycaemia requiring supplementation

■ Neutropenia (see below)

- Bacteraemia/sepsis: Amoxicillin/clavulanate 20 mg/kg IV q8h
- f recent (<3 months) beta lactam administration Fluoroquinolone (enrofloxacin 10 mg/kg IV q24h (dogs) OR marbofloxacin
- 5 mg/kg IV q24h (cats)) AND clindamycin 11 mg/kg IV q12h OR metronidazole nvestigations must be performed to identify likely source and obtain samples (i.e. urine, bile, effusions, airway wash). Source control surgery required if amenable

Transition to oral medication when clinical signs improve. Base duration on

mprovement in clinical signs (patient demeanour, pyrexia \pm CRP (dogs only))

- Amoxicillin/clavulanate 20 mg/kg IV q8h
- ADD fluoroguinolone if recent (<3 months) beta lactam administration

improvement in clinical signs (patient demeanour, pyrexia \pm CRP (dogs only)).

- amoxicillin/clavulanate unavailable Cefuroxime 20 mg/kg IV q8h AND clindamycin 11 mg/kg IV q12h OR
- metronidazole 10 mg/kg IV q12h f colonic perforation
- ADD metronidazole 10 mg/kg IV q12h
- Definitive source control essential as soon as possible Transition to oral administration when clinical signs improve. Base duration on

Courses as short as 4 days are used in humans

- Mild (neutrophil count >1000/ μ l) AND well
- No antibiotic required Moderate (neutrophil count <1000/μl) AND well
- Cefalexin PO
- Amoxicillin/clavulanate PO Trimethoprim/sulphonamide PO
- Severe (neutrophil count <500/μl) OR mild/moderate neutropenia AND unwell (e.g. hypotension despite fluids, hypoglycaemia with sepsis suspected, severe gastrointestinal signs or pyrexia) Amoxicillin/clavulanate OR cefuroxime IV

Stop antibiotics when neutrophil count >1000/µl

- ORTHOPAEDIC INFECTIONS Discospondylitis
- Cefalexin
- Amoxicillin/clavulanate

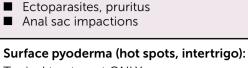
Amoxicillin/clavulanate

- Trimethoprim/sulfadiazine
- ntravenously, if severe neurological compromise or signs of sepsis Treat for minimum 6–8 weeks (based on clinical response) Bacterial infective (septic) arthritis:

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



- Cefalexin OR cefuroxime
- Amoxicillin/clavulanate ntravenously for first 2–3 days then orally for 6–8 weeks



Antibiotics are not indicated for:

SKIN INFECTIONS

■ Malassezia dermatitis

Topical treatment ONLY 2-4% chlorhexidine or other antiseptics q1-3d If not responsive or very severe

Fusidic acid \pm glucocorticoid (cocci) Silver sulphadiazine (if rods)

Superficial pyoderma Topical treatment ONLY is appropriate Review after 2–3 weeks and continue until underlying cause

dentify underlying disease as skin infection is ALWAYS secondary

- 2-4% chlorhexidine q1-3d
- If non-responsive to topical antibiotic therapy Clindamycin
- Trimethoprim/sulphonamide Cefalexin
- Amoxicillin/clavulanate Systemic antibiotics ALWAYS in combination with topical antiseptics
- Treat for 2 weeks then reassess. If poor response investigate resistance (cytology, culture and susceptibility testing) Use doses at upper end of range ALWAYS culture if there is a history of MRSP/MRSA OR prior antibiotic courses OR if rods are seen on cytology

Deep pyoderma:

Topical treatment ONLY

Whilst culture and susceptibility testing pending, ONLY start systemic antibiotic (as for superficial pyoderma) if painful OR risk of septicaemia

Treat for minimum 3 weeks and reassess g2w (consult QR code) Anal sac inflammation/engorgement:

Manual evacuation, flushing with chlorhexidine ± packing with topical polypharmacy ear product (avoid products containing EMA category B antibiotics)

Concurrent topical treatment with 2-4% chlorhexidine g1-3d

- Anal sac abscessation: Flush and drain as appropriate ONLY if signs of cellulitis
- Amoxicillin/clavulanate

Trimethoprim/sulphonamide

EAR INFECTIONS Antibiotics are not indicated for:

■ Malassezia dermatitis ■ Ectoparasites, pruritus

- Otitis externa: Topical treatment ONLY Care: integrity of tympanic membrane. Avoid ototoxic products if tympanic membrane ruptured
- \Box Antiseptic ear cleaner + topical \pm systemic steroid products
- If no response after 7 days ADD topical antibiotic + cleaning Fusidic acid/framycetin
- Florfenicol
- Antiseptic ear cleaner whilst awaiting culture results
 - Framycetin If Pseudomonas cultured ADD TrisEDTA + topical antibiotic

Treat until cytology negative and underlying cause corrected

RESPIRATORY INFECTIONS

unless secondarily infected

- Chronic bronchitis/allergic airway disease/feline asthma
- Nasal discharge bacteria are NOT primary nasal pathogens
- Canine infectious respiratory disease complex (kennel cough) and feline upper respiratory tract infection (cat 'flu):
- ONLY if clinical signs present >10 days and/or unwell ___ Doxycycline Amoxicillin/clavulanate

Treat for 5–7 days Culture nasal tissue NOT nasal discharge from refractory cases Pneumonia (including aspiration pneumonia/pneumonitis):

cases (provided close monitoring is available) Amoxicillin/clavulanate Treat for 3–7 days and review based on clinical signs \pm C-reactive

Oxygen therapy and analgesia may be sufficient in some

protein (dogs only) If clinical deterioration/failure to respond despite first-line therapy Fluoroquinoline + clindamycin

Doxycycline

Surgical exploration and lavage, or lavage via thoracostomy tubes

Amoxicillin/clavulanate 20 mg/kg IV q8h

If suspected Bordetella bronchiseptica

If patient has received beta lactam antibiotic within the last 3 months Clindamycin 11 mg/kg IV q12h AND enrofloxacin 10 mg/kg IV q24h (dogs only) OR marbofloxacin

Treat for 2 weeks OR based on improvement in clinical signs (patient

demeanour, radiographic/ultrasonographic resolution \pm C-reactive protein (dogs only)) If *Nocardia* suspected (dogs) Trimethoprim/sulphonamide

- Prophylactic antibiotics are not indicated for:
- Clean surgical procedures including many orthopaedic
- Dental procedures including tooth extractions ■ Postoperative use for ANY procedure unless treating known infection
- Prophylactic (perioperative) antibiotics are appropriate: ■ For prolonged clean surgery (anticipated >90 minutes)
- For surgery involving an implant (e.g. pin, screw, plate or stent) For surgery involving entry into a hollow viscus (e.g. gastrointestinal
- tract, urinary tract) or where a joint capsule is penetrated ■ For debilitated or immunosuppressed patients (ASA score 3 or above)
- Cefuroxime 20 mg/kg IV Cefazolin 22 mg/kg IV Amoxicillin/clavulanate 20 mg/kg IV
- Administer 30-60 minutes before the first incision, then every 90 (amoxicillin/clavulanate) or 120 (cefuroxime, cefazolin) minutes until the
- Where anaerobic involvement is highly likely (e.g. colonic surgery) ADD metronidazole 10 mg/kg IV Do not continue antibiotics beyond the day of surgery, unless there is a

Therapeutic antibiotics are indicated:

contamination of the surgical site

herapeutic indication

To treat a KNOWN bacterial infection (e.g. septic peritonitis) or if there is pre-existing remote infection Where there is an obvious major break in asepsis causing significant

Until source control has been achieved AND sufficient clinical

improvement documented for dirty procedures

For 2–3 days postoperatively for open fractures

- **MISCELLANEOUS INFECTIONS** Surgically managed pyometra:
- Amoxicillin (± clavulanate) Cefalexin + enrofloxacin

If unwell, consider perioperative

Medically managed pyometra:

Amoxicillin (+ clavulanate)

No antibiotics

Mastitis: Cefalexin

Amoxicillin/clavulanate

Treat for 2-3 weeks or until offspring weaned (early weaning NOT advised) Mycoplasma haemofelis (feline infectious anaemia):

___ Doxycycline

Treat for 2-4 weeks

eat for ∠ week:

Snake bites

Superficial SSI:

opical treatment ONLY

discharge from deep incision

Trimethoprim/sulphonamide

- Suspected leptospirosis: Amoxicillin (+ clavulanate)
- Hepatic encephalopathy Diet and lactulose should be first line therapies
- Metronidazole (decreased dose) Amoxicillin Ampicillin

Use ONLY until clinical signs are controlled

Doxycycline (may achieve improved renal clearance)

ONLY if clinical signs persistent despite dose escalation

WOUNDS AND SURGICAL SITE INFECTIONS

- Antibiotics are not indicated for: ■ Cat bite abscess (unless surrounding cellulitis or pyrexia)
- Cutaneous surgical site dehiscence without gross evidence of systemic or surgical site infection (SSI) Acute superficial traumatic wounds
- Bites and traumatic wounds: Decontaminate and debride (lavage ± surgical debridement ± use
- If systemically well and not pyrexic Wound lavage with isotonic solution (e.g. saline)
- If wound located over abdomen or thorax Further investigation (imaging) \pm surgical exploration may be required If systemically unwell OR pyrexic OR suspicion of cavity penetration

Cefuroxime \pm cefalexin

- Amoxicillin/clavulanate Acute bite wound prophylaxis ___ Thorough flushing with saline + open wound management
- Systemic antibiotics not required if affected region is superficial and Amoxicillin/clavulanate (for 1–3 days or until tissues declared viable) if bite at critical site
- Frequent saline lavage If systemically unwell OR pyrexic OR local cellulitis/purulent
- Cefuroxime OR cefalexin Amoxicillin/clavulanate If rods are seen on cytology, or prior antibiotic courses

Freat for 1–2 weeks guided by clinical progression

If there is a history of MRSP/MRSA Await susceptibility testing and assess clinical response before adapting treatment

Organ space or implant-associated SSI: As for deep SSI whilst culture pending, systemic antibiotic therapy

progression following source control

successful treatment

Consider ADDING fluoroquinolone

based on cytology with duration of therapy guided by clinical Source control (e.g. removal of infected implant material) critical to

ADVERSE REACTIONS TO ANTIBIOTICS

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

Certain antibiotics can cause serious adverse effects, including nephrotoxicity, anaphylactoid reactions, blindness, dysbiosis, hypersensitivity reactions, keratoconjunctivitis sicca and immune complex reactions. This list is not comprehensive.

Consult QR code for additional information on at-risk groups and recommendations to minimize risks.

European Medicines Agency antibiotic categories

should not be used in animals.



GUARDIAN

Category A (Avoid): DO NOT USE

Antibiotics with restricted use in human medicine (e.g. imipenem, linezolid, teicoplanin, vancomycin)

Category B (Restrict): the highest priority critically important

antibiotics The use of fluoroguinolones (enrofloxacin, marbofloxacin, pradofloxacin, ciprofloxacin) and 3rd generation cephalosporins (cefovecin) should be restricted to mitigate the risk to public health. Samples should be submitted for antibiotic susceptibility testing before starting these agents where possible.

Category C (Caution)

Should only be used when there are no suitable antibiotics in Category D that would be clinically effective.

Category D (Prudence): first-line antibiotics

The use of first-line antibiotics **should be limited** to

times of genuine clinical need. Avoid all unnecessary use and long treatment periods.

Responsible antibiotic 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

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.

development of resistance, particularly where culture and sensitivity

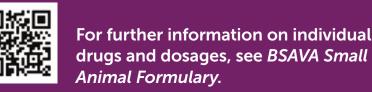


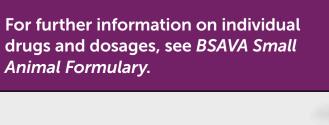
Use non-prescription forms, available from the BSAVA Library. The forms support your decision not to prescribe



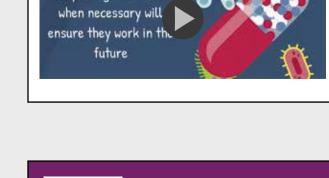
VMD Summary Position Statement

further information on the risks of unnecessary antibiotic use, including the owner education animation.









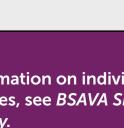






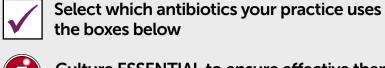








A LOSAVA



Culture strongly ADVISED to guide therapy

Consult QR code information for dedicated

Scan the QR codes to access extra information.

- Acute vomiting

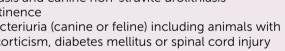
■ Gastric *Helicobacter* infections

Chronic diarrhoea

- See 'Life threatening infections' Parvovirus ONLY if neutrophil count <1x109/
- Clinical Giardia infection: Fenbendazole for 5 days

If refractory to first-line therapy

JRINARY TRACT INFECTIONS



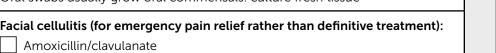
Sporadic cystitis (bacterial urinary tract infection): Amoxicillin (<u>+</u> clavulanate)

Reinfection, recurrent and persistent urinary tract infections:

If recurrent/persistent infection, modify selection based on susceptibility

- Dietary modification and urine acidification useful for dissolution

- Osteomyelitis (confirmed via histopathology): Amoxicillin/clavulanate for 4–6 weeks or as indicated by fresh



Topical chloramphenicol