Pulse antibiotic therapy: it’s time to cut back

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The use of antibiotics in small animal practice has become an important and controversial issue. The general public is aware that antibiotic resistance is of increasing concern in medical and veterinary healthcare and that antibiotics should only be used where necessary (Guardabassi and Fondati 2009). It is our goal as veterinarians to prevent misuse and promote responsible use of antibiotics to preserve their efficacy and minimise the development and spread of resistance.

Practical guidelines for responsible antimicrobial use in small animal practice have been developed, which all seek to minimise antimicrobial use and recognise that repeated courses of systemic antimicrobials are a risk factor for the development of antimicrobial resistance. Examples of guidelines that have been developed include those from BSAVA/SAMsoc, BVA, ISCAID and Pfizer Animal Health.

Many pyoderma, however, are recurrent (Noli 2003, May 2006). How are these best managed in an era when we seek to minimise antimicrobial use? The first step is to determine when the pyoderma recurs (Noli 2003). If the pyoderma relapses after a few days, then the antibiotic course was too short. A longer course, following bacterial culture and antibiotic sensitivity testing to check that the drug will still be effective, should be administered. If the pyoderma relapses weeks or months after antibiotic withdrawal, then there’s probably an undiagnosed or uncontrolled underlying cause (Noli 2003, May 2006). It is essential that the underlying cause is diagnosed and managed. Once the pyoderma has resolved, animals should be thoroughly examined for any remaining clinical signs consistent with a skin disease or other condition predisposing to infection. Routine haematology, biochemistry and urinalysis should be performed. Thyroid function should also be assessed, although sick euthyroid syndrome associated with skin infections and certain antibiotics can complicate interpretation of the results. A normal urinary cortisol:creatinine ratio can help to eliminate hyperadrenocorticism, but stress, other illnesses and drugs being prescribed commonly give false positive results.

A small number of cases suffer relapsing pyoderma if an underlying cause cannot...
be found (primary pyoderma) or cannot be controlled (eg, ongoing chemotheraphy) (Noli 2003, May 2006). Colonisation with *Staphylococcus pseudintermedius* is also much more frequent in dogs with atopic dermatitis compared to healthy dogs (Fazakerley and others 2009). Why some dogs are prone to recurrent infection isn’t clear, but impaired cutaneous immunity and an altered skin barrier are probably involved. Although it seems counterintuitive, cases of atopic dermatitis with recurrent pyoderma are best managed with anti-inflammatory therapy and skin barrier care, as restoration of the skin barrier and resolution of inflammation reduces staphylococcal colonisation. Essential fatty acid-enriched diets help ameliorate atopic dermatitis (Bensignor and others 2008, Glos and others 2008), and may improve general skin immunity and skin barrier function.

There has been renewed interest in managing these cases without using repeated courses of systemic antibiotics. First, and without apologies for repetition, clinicians must manage the primary problem – does that atopic dog really need more effective anti-inflammatory treatment rather than more antibiotics? Regular and effective topical antimicrobial therapy can also reduce colonisation of the skin. Chlorhexidine products appear to be the most effective in vitro (Young and others 2012), and have been shown to effectively manage skin infections associated with meticillin-resistant *S. pseudintermedius* (Murayama and others 2010). It’s important to show owners how to bathe their animal effectively – shampoos need to be used two to three times weekly and should have a 10-minute contact time. The mucocutaneous carriage sites must also be treated. Practices or dog groomers with bathing facilities and expertise can help. If bathing alone can’t manage the recurrent infection, it is worth considering immunostimulants such as a staph phage lysate (DeBoer and others 1990) or autogenous bacterial vaccines (Curtis and others 2006). These are well tolerated and have been successful in a number of cases.

The regular and routine use of antibiotics should only be considered in cases that have not responded to other measures and where the clinical signs are severe enough to warrant therapy. It is debatable whether repeated courses of systemic antibiotics can be justified in animals with mild, focal and self-limited episodes of pyoderma. Moreover, intermittent cases with several weeks between relapses may be better treated with individual courses of antibiotics rather than continuous pulse therapy.

If pulse antibiotic therapy is necessary, topical antibiotics should be considered first. Topical antibiotics can be suitable for focal lesions, and may be useful to treat mucocutaneous reservoir sites (Sajonmaa-Koulumies and others 1998). Controlling the mucocutaneous reservoirs can help to reduce colonisation and infection of the skin elsewhere. Pulse therapy with systemic antibiotics is not recommended for managing idiopathic recurrent pyoderma and should only be used as a last resort. If necessary, bactericidal antibiotics such as amoxicillin-clavulanate or cefalexin can be given at the appropriate dose on two to three consecutive days each week. This ‘weekend therapy’ increases compliance and improves efficacy, which may reduce the development of resistance (Carlotti and others 2004). Macrolides and lincosamides may be suitable, but repeated use may quickly select for resistance to these drugs. The efficacy of simple penicillins, tetracyclines and sulfonamides is usually limited by the high frequency of resistance among *S. pseudintermedius* isolates. Long duration injectable antibiotics and fluoroquinolones are not suitable for pulse dosing.

Regular checks are essential to monitor treated animals for general health and signs of underlying conditions, as these may not become evident for some weeks or months after the skin infections become apparent. Regular re-examination also helps encourage compliance and allows discussion of routine hygienic precautions (the BSAVA, FECAVA and Bella Moss Foundation websites can help with this). Careful clinical examination and cytology can be used to identify any signs of ongoing pyoderma. Lesions should be swabbed for culture, as repeated courses of antibiotics are a risk factor for antibiotic resistance. Antibiotic use may also predispose to clinically inapparent carriage of meticillin-resistant *Staphylococci* and extended spectrum β-lactamase-producing *Escherichia coli* that could be a risk to owners. This risk is as yet unknown, but it may be prudent to culture nasal swabs, perineal swabs and faces.

### References


### Guidelines


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