

**BEVA** 2022 7 - 10 Sept  
ACC, Liverpool



**C**  **NGRESS**

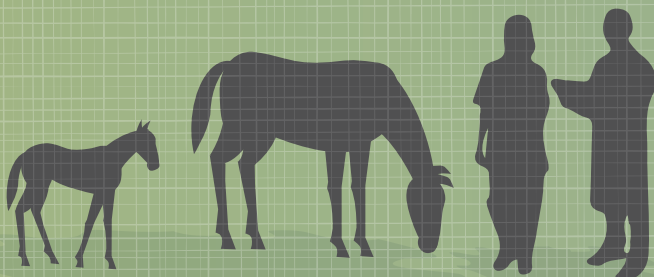
Championing the Equine Vet



**60th**



**Handbook of Presentations**



14.45

## What antimicrobials should we be using and why not finishing a 'course' of antimicrobials is good

**Bettina Dunkel**, DVM, PhD, DACVIM, DACVECC, DECEIM, FHEA

Equine Referral Hospital, The Royal Veterinary College, Hawkshead Lane, North Mymms, Herts AL9 7TA, UK. Email: bdunkel@rvc.ac.uk

### Learning objectives

- Understand factors influencing use of antimicrobials in clinical cases
- Differentiate between indicators of inflammation and bacterial infection in clinical cases
- Recognise clinical and diagnostic indicators that antimicrobial treatment can be discontinued

Many diseases in horses are associated with bacterial infection. Clinical signs are largely reflective of the immune response to the infection causing either localised or systemic inflammation. Unfortunately, viral or fungal infection, bacterial toxins, tissue damage or neoplasia also cause systemic inflammation and clinical signs of inflammation triggered by bacterial infection are indistinguishable from inflammation due to other causes. Although not effective against viral, inflammatory or neoplastic conditions, antimicrobials are often used in these cases as it can be difficult to conclusively rule out a bacterial infection. Due to increasing microbial resistance, pressure on veterinarians is mounting to adhere to responsible use of antimicrobial drugs.

Clinical examination findings are often nonspecific and while the presence of a fever increases suspicion of an infection, it is not conclusive, as inflammation, hyperthermia, neoplasia or tissue trauma can also lead to an increased temperature. Equally, the absence of a fever does not rule out even severe infection. Haematology and acute phase protein concentrations such as fibrinogen or serum amyloid A (SAA) can be difficult to interpret as increases are triggered by infectious and noninfectious inflammatory conditions [1,2]. In adult horses, leucopenia is commonly observed with inflammation, often originating from the gastrointestinal tract. It does not necessarily indicate the presence of infection or the need for antimicrobials. Leucocytosis in mature horses can be associated with inflammatory, infectious and neoplastic conditions or following administration of corticosteroids and is therefore also of limited use when trying to differentiate bacterial infection from other diseases. As immediate treatment is usually required, clinicians need to make an educated guess whether bacterial infection is likely. Many equine viral and some bacterial diseases can be diagnosed by polymerase chain reaction (PCR) with results often being available the following day. Cytological samples, particularly tracheal lavages, can be of great value when trying to rule in or out an infectious aetiology as results are available much quicker than culture results. In cases where clinicians have already initiated antimicrobial treatment but PCR or cytology do not support a bacterial infection or identify

a viral cause, antimicrobial treatment should be discontinued immediately. The old concept that 'a course of antibiotics needs to be finished to avoid development of resistance' is obsolete and not supported by evidence. On the contrary, reducing the length of treatment has a significant effect on decreasing previously existing resistance [3] while increasing the length of antimicrobial use increases the risk of resistance development [4]. In most cases, a short duration of antimicrobial therapy ranging from a single dose (for example preoperatively) to 24–72 h is sufficient, with long-term treatment rarely being required. Recent studies in people have shown impressive reductions in antimicrobial resistance with a reduction of not only overall use but also with a decrease in days of antimicrobial therapy, highlighting the importance of shortening treatment [3]. Limiting the duration of antimicrobial treatment in proven infections can be challenging. Fear of negating a treatment success often leads to prolonging use of antimicrobials in clinically apparently recovered patients. In the past, return to normal haematological parameters or normal concentrations of acute phase proteins have been used as markers to safely discontinue antimicrobial treatment. Return to normothermia, improved appetite and return of normal demeanour might be better indicators that further treatment is not necessary. Resolution of ultrasonographic or cytological abnormalities in cases of pneumonia or peritonitis are also indications that antimicrobials can be discontinued. The common practice of initially treating systemically ill horses with injectable antimicrobial drugs for 48–72 h followed by continued oral treatment is probably in most cases an overtreatment and not necessary. An alternative approach is stopping antimicrobial treatment after 48–72 h and monitoring the patient closely. Should signs of infection reoccur, such as recurrence of a fever, a decrease in appetite or change in demeanour, treatment can easily be reinitiated but this is rarely necessary.

### References

1. Westerman, T.L, Tornquist, S.J, Foster, C.M. and Poulsen, K.P. (2015) Evaluation of serum amyloid A and haptoglobin concentrations as prognostic indicators for horses with inflammatory disease examined at a tertiary care hospital. *Am. J. Vet. Res.* **76**, 882–888.
2. Long, A. and Nolen-Walston, R. (2020) Equine inflammatory markers in the twenty-first century: a focus on serum amyloid A. *Vet. Clin. North Am. Equine Pract.* **36**, 147–160.
3. Donà, D., Barbieri, E., Daverio, M., Lundin, R., Giaquinto, C., Zaoutis, T. and Sharland M. (2020) Implementation and impact of pediatric antimicrobial stewardship programs: a systematic scoping review. *Antimicrob. Resist. Infect. Control.* **9**, 3.
4. Llewelyn, M.J., Fitzpatrick, J.M., Darwin, E., Tonkin-Crine, S., Gorton, C., Paul, J., Peto, T.E.A., Yardley, L., Hopkins, S. and Walker, A.S. (2017) The antibiotic course has had its day. *BMJ.* **358**, j3418.