

# Prudent Use of Antimicrobials in Exotic Animal Medicine



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## KEYWORDS

• Antimicrobial stewardship • Use • Resistance • Monitoring • Policy

## KEY POINTS

- Awareness starts with monitoring: knowing what resistant bacteria are emerging in patients and the environment and which and how frequently antimicrobials are being prescribed and used by veterinarians in specified animal species.
- The next step is to choose effective therapy strategies of active substances, doses, and duration that result in minimal selection of resistance.
- The recognition of the nonrenewable nature of the available antimicrobials in animal medicine stimulates the prudent use of antimicrobial medicines.
- Antimicrobial stewardship consists of a coherent set of actions that promote prudent use of antimicrobials with an emphasis on societal responsibility.

## INTRODUCTION

Antimicrobial use (AMU) in veterinary medicine is considered a potential threat for public health. Overuse and misuse of antimicrobials in animals and humans are contributing to the rising threat of antimicrobial resistance (AMR). AMR is the ability of microorganisms, such as bacteria, to become increasingly resistant to an antimicrobial to which they were previously susceptible. Any use of antimicrobials favors the survival and spread of resistant bacteria or genes. This selection pressure applies to pathogenic bacteria, but also to commensal bacteria (eg, gut flora). Longer treatments automatically result in more selection of AMR, underdosing or poor client compliance results in therapy failure and therefore futile application of antimicrobials. Over time, this makes antimicrobials less effective and ultimately useless. To reduce

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the burden of AMR, prudent use of antimicrobials should be promoted. In 2015, the World Health Organization (WHO) endorsed a global action plan to tackle AMR<sup>1</sup> and recently it recommended banning the prophylactic use of antimicrobials in healthy animals.<sup>2</sup> The WHO also compiled a list of critically important antimicrobials for human medicine for risk management of AMR because of nonhuman use (Table 1).

Most action plans are primarily focusing on AMU in food-producing animals, but recommendations are also applicable for other animal species, including exotic animals. In response to publications from WHO, the European Commission (making the European Union a best practice region<sup>3</sup>), other international organizations, and several national and international veterinary associations have developed recommendations and policies on prudent use of antimicrobials, not only for food-producing animals, but also for companion animals<sup>4</sup> and horses.<sup>5</sup> In exotic animals, such recommendations and policies seem to be lacking. A search on Web sites of various exotic animal-related veterinary associations (eg, Association of Exotic Mammal Veterinarians [AEMV], European College of Zoological Medicine [ECZM], European Association of Zoo and Wildlife Veterinarians [EAZVV]) revealed no documents on prudent use of antimicrobials. Evaluation of overuse or misuse in exotic animals is hard because little to no information is available on AMU and AMR in these animals. In general, it seems that there is plenty of room for improvement in AMU and AMR in exotic animal medicine. This article discusses different actions in veterinary medicine on prudent AMU, and addresses the applicability of these actions in exotic animal medicine.

## MONITORING OF ANTIMICROBIAL USE

Any plan to promote prudent use has to start with monitoring AMU: the numbers tell the tale. Implementation of monitoring programs is crucial to reduce AMU and AMR. National programs monitoring AMU and AMR in animals have been established in several

**Table 1**  
List and classification of antimicrobials important for human medicine

Antimicrobial Class	Example of Drugs
Aminoglycosides	Gentamicin
Ansamycins	Rifampicin
Carbapenems and other penems	Meropenem
Cephalosporins (third, fourth, and fifth generation)	Ceftazidime, cefepime
Glycopeptides	Vancomycin
Glycylcyclines	Tigecycline
Lipopeptides	Daptomycin
Macrolides and ketolides	Erythromycin, azithromycin
Monobactams	Aztreonam
Oxazolidinones	Linezolid
Penicillins (natural, aminopenicillins, and antipseudomonal)	Ampicillin
Phosphonic acid derivatives	Fosfomycin
Polymyxins	Colistin
Quinolones	Ciprofloxacin
Drugs used solely to treat tuberculosis or other mycobacterial diseases	Isoniazid

Data from World Health Organization. Critically important antimicrobials for human medicine. 5th revision. 2017. Available at: <http://www.who.int/foodsafety/publications/antimicrobials-fifth/en/>. Accessed December 17, 2017.

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