

So essentially, the reason why these dogs keep on getting recurrent Staphylococcal infections is because the underlying disease, their atopic dermatitis, and the skin barrier changes and the inflammatory changes that occur with that condition, are helping to drive a skewing of the microbiome towards this staphylococci out of balance with the rest of the microbiome. These are capable of inducing inflammation, and you wind up with this vicious circle of recurrent inflammation and recurrent infection. Now, back in the day, that was managed by recurrent antibiotic courses, and even pulse antibiotic therapy, where these atopic dogs would be given cephalexin or amoxycylav on a Saturday and Sunday of each week.

Now, we've already seen that this is a major driver of resistance amongst the commensal organisms. In particular, really, we need to be understanding that these dogs don't have a cephalexin deficiency, or whatever your treatment of choice is. They have underlying reasons for their infections, which need managing to maintain a healthy microbiome, and stop these commensal organisms taking over.

So, for example, this would be by better management to the skin barrier and the underlying inflammation in atopic dermatitis, managing other inflammatory diseases, managing the underlying neoplasia or endocrinopathy repairing the wounds, tidying up the trauma, removing foreign bodies and implants, and so on. So we need to get smarter about thinking why is the infection there, and actually manage that, and not just react to the presence of the infection.

Now, in terms of animal care, again, we can take the same argument and say that we shouldn't be using antibiotics to mask deficiencies in animal care and husbandry. And if recurrent infections are becoming a problem, again, we need to look at the reason why, and not just react to the presence of the infection. And this can be looking at stocking density, cleanliness, hygiene, husbandry practices with production animals, and certainly surgical technique and infection control within a hospital setting.

Now, across to the right there are ways of looking at helping maintain a diverse, rich, and even microbiome, so that we can maintain health, and again, prevent the skewing of this microbiome here. Now, this is where, unfortunately at the moment, there is much less evidence.

But I suspect in a very short period of time, we're going to have much more evidence about the use of prebiotics and probiotics and microbiome transplants to maintain healthy cutaneous and systemic microbiomes. And certainly by using fewer systemic antibiotics, and much more non-antibiotic treatment, much more topical treatment, we can reduce the impact of these drugs on the microbiome and reduce the selection for resistance, and reduce the selection for much more potentially virulent organisms that can become established in niches.