Protocol case example: In-house ear cytology by Plymouth Veterinary Group

Name of initiative: Introduction of in-house ear cytology to increase the utilisation of RVNs and help the veterinary surgeon in diagnostic decision making

Initiative start date: June 2019

Submitted by: Nicola Ackerman, Head Medical Nurse

Introduction

I am a student on the Masters in Advanced Veterinary Nursing course at Glasgow University. As part of this, I completed a module on Clinical Governance where we were required to perform a literature review and design a protocol, which I then instigated into practice.

The practice found that a large number of ear preparations (antibiotics, ear cleaners) were being stocked. Responsible use of antimicrobials has been widely discussed in the mainstream media, not just the veterinary media. Veterinary bodies and representative associations have all shown support towards reducing the overall amounts of antimicrobials that are prescribed and used in the veterinary field (Ungemach *et al.,* 2006). Actively reducing the usage of antimicrobials in veterinary practice has been suggested, through the encouragement of laboratory analysis of samples for culture and selectivity before antimicrobial prescription, alongside education of prescribers on the importance of antimicrobial resistance (Hardefeldt *et al.,* 2018). These results can however take time and have a financial implication. Pressures from pet owners on veterinary surgeons for results, and sometimes for the actual medications, can make this difficult.

As a practice we wanted to utilise our RVNs' skills more, to help the veterinary surgeons with their decision-making, to support the clients and improve the outcomes for the pets. We have specific RVNs that have undertaken additional CPD and certificates in dermatology and cytology analysis. We wanted to help these RVNs show that their knowledge and skills were not wasted and to improve all outcomes.

Aims

1. Reduce the usage of antimicrobials in practice.
2. Utilise RVN skills with cytology

Actions

We recommend antibiotics in line with the British Small Animal Veterinary Association (BSAVA) PROTECT recommendations. The association set out recommendations for antimicrobial use in specific circumstances based on cytology (BSAVA, 2014). Cytology should be performed in all cases of otitis externa (Forsythe, 2016). It enables the use of targeted therapeutics and accurate monitoring of the response to treatments (Forsythe, 2016). Samples for cytology can be obtained either via a swab

or gloved finger, the material is rolled onto the microscope slide. The slide should be stained using modified Wright's stain such as DiffQuik or Rapi-Diff (Forsythe, 2016).

Samples should be viewed under the x400 dry field and then x1000 oil immersion lens of the light microscope. A semi-quantitative system of assessing yeasts and bacteria number in the sample can be instigated. Recommendations by Ginel *et al.* (2002) are made that samples with greater than 5 yeasts per high power dry field (HPDF) (x400 magnification) and greater than 25 bacteria per HPDF (>12/HPDF for yeast and >15/HPDF for bacteria in cats) being considered significant. The literature review supported that this is something that we should be doing and would be achievable in first opinion practice with the equipment that we have.

A simple protocol was written:

- All clients with animals being presented for ear issues to have a discussion with the veterinary surgeon about the importance of having a cytology sample taken before antimicrobial choice.
- If consent is gained from the owner, the sample is taken, placed onto a microscope slide, stained, and examined. Identification of whether there are bacteria (cocci or rods), yeasts or neutrophils present. A semi-quantitative count can be made and recorded with findings on the clinical history. The veterinary surgeon can then make an informed decision on which antimicrobial to use and whether culture and sensitivity is required.

Shaw (2016) stated that opinions surrounding the value of bacterial culture and selectivity testing in otitis externa are divided. This is due to the higher concentrations of the antibiotic being achieved *in vivo* overcoming apparent *in vitro* bacterial resistance in cultured samples. Shaw (2016) has indicated certain circumstances when culture and selectivity should be performed:

- If rod-shaped bacteria are seen on cytology
- When the patient has had multiple previous courses of antibiotics
- If there has been poor response to previous treatments
- If systemic treatment is indicated.

The literature review gave value to the RVNs performing ear cytology for cases. It also acted as a CPD opportunity to review all available literature and apply evidence-based learning to the practice setting.

Results

Plymouth Veterinary Group instigated the above protocol regarding ear cytology recommendation prior to prescribing of ear antibiotics, in June 2018. There are no veterinary surgeons within the practice with an interest in dermatology, there is a team of RVNs with either additional qualifications in dermatology and/or a keen interest in laboratory work. The RVNs were happy with sample staining and identification of yeasts, bacteria (rods and cocci) and neutrophils. The veterinary surgeons based their findings on these results. All clients were offered ear cytology. Results of the total net cost of topical ear antimicrobials and ear cleaners, total income from nurses performing microscopy and the total income to the practice were calculated(see Figure 1).

There has been a very large increase in the number of semi-quantitative microscopy assessments that the RVNs are undertaking. In July 2019 this numbered 60, which causes the reciprocating peak in financial returns in Figure 1. The number of topical antimicrobial preparations that are being utilised has decreased. The number of swabs taken for external culture and selectivity at a reference

laboratory did not alter. The financial value to the practice has increased, even though fewer topical ear antimicrobials are being sold.

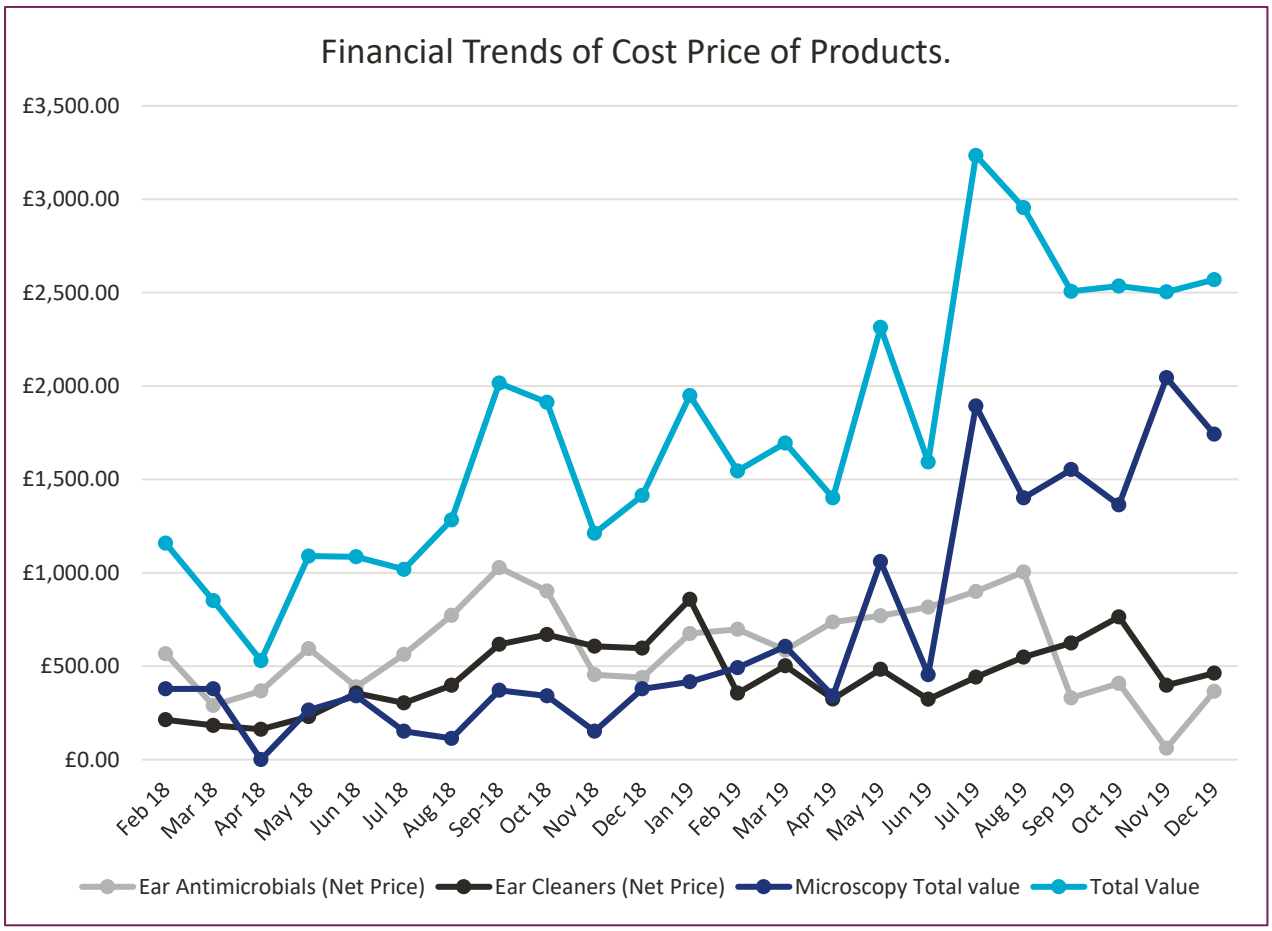

Figure 1: Financial trends of cost price of products

Impact of Intervention

The veterinary surgeons felt more justified in the prescribing of antibiotics for these cases. They also felt happier when not prescribing antibiotics as they had evidence to support their decision-making process. It is difficult to say that it improved animal welfare or clinical outcomes as we didn't have control cases.

The veterinary nurses involved with this project felt happy with their utilisation within the practice and felt that their additional training was worthwhile and was being used. It has greatly increased engagement in cytology and microscope use. Having staff that are confident with using the equipment has meant that it is being used more and the SVNs are really benefiting from this. The practice has even bought us a new microscope (with a digital screen) so we can expand what the RVNs are doing, save images, and easily show the SVNs what we are looking at. I, and the other RVN that is undertaking these cytology examinations, have also led a few in-house sessions where we have been teaching the veterinary surgeons (and some other RVNs) how to look at these samples.