Protection of critically important antimicrobials

RCVS Knowledge Antimicrobial Stewardship Award Champion 2023

Paragon Veterinary Referrals, Linnaeus

Introduction

Paragon Veterinary Referrals is part of the Linnaeus group of practices. Until 2019 there were written guidelines but no active, formal Antimicrobial Stewardship (AMS) initiative at this practice. Antimicrobial prescribing was performed by individual vets with only personal accountability and reflection, and little discussion on responsible use. There had been no previous auditing activities to assess, monitor and engage the wider hospital in the responsible use of antimicrobials.

The motivation for the audit was multifactorial. The lead of the AMS program was passionate about justified and appropriate antibiotic use and protecting critically important antimicrobials. The initiative was fully supported by the Clinical Director and members of the senior leadership team.

Along with members from the Infection Control Team already in place, individuals from across the clinical teams volunteered to form an Antimicrobial Stewardship Team (AMS Team). This team included both veterinary surgeons (VS) and registered veterinary nurses (RVN) with the primary aim of reducing the prescription of critically important antimicrobials. A secondary aim was to reduce the inappropriate use of all antimicrobials.

Members of the team acted as role models of antimicrobial stewardship within the hospital and when training other members of the clinical team (residents and interns). This included being approachable to allow open and constructive discussions about antimicrobial choices.

Aims of the clinical audit

The main aim of the initiative was to protect critically important antimicrobials without any compromise to patient care and outcomes.

An annual audit of critically important antimicrobial use was planned by retrospectively

reviewing prescribing incidents to assess whether the prescription was justified and appropriate. The team presented the results to the rest of the clinical team and used the principles of 'Plan, Prevent, Protect' to educate, promote constructive discussion, drive culture change, and establish whether corrective measures need to be implemented to improve prescribing habits and prevent inappropriate antimicrobial usage in the future.

Plan: Education to improve knowledge of the typical infections seen in certain clinical scenarios, the importance of appropriate bacterial culture and sensitivity testing, interpretation of sensitivity results, the most appropriate antimicrobial to use when faced with multiple options on a sensitivity panel, the appropriate length of a course of antimicrobials, tools to monitor infections and de-escalation of antimicrobials.

Prevent: Engagement of the wider Infection Control Team at a hospital level to ensure appropriate biosecurity measures are in place including hand hygiene, personal protecting equipment, cleaning and disinfection, team member training, surgical preparation, laundry, and owner education.

Protect: Protection of critically important antimicrobials by implementing steps to ensure their appropriate use without any compromise to patient care and outcome.

Actions

A member of the AMS Team acts as Champion to lead the group, including the annual audit. The process of reviewing prescriptions is divided between members of the group to reduce the burden on one member of the team. At the launch of the audit, engagement was encouraged by providing information about the wider impact of antimicrobial resistance on individuals, other pets, and society.

Figure 1: Photo from 2019 when the scheme was launched and nearly 100% of team members pledged to be antibiotic guardians. This was promoted on social media to reach a larger audience.

The team brought together learning from CPD events with clinicians and clinical pathologists discussing antimicrobial stewardship and the experience of an internal medicine specialist leading the group to form a basis of knowledge to inform their project.

RCVS Knowledge clinical audit and antimicrobial stewardship resources were accessed to design the audit and create guidelines. The BSAVA PROTECT ME poster[1] was displayed in the vets' office and the topic of AMS was included in many of the vet meetings to ensure awareness of the ongoing audit in the use of critically important antibiotics.

The actions undertaken were:

- Data from every systemic prescription of a critically important antibiotic was gathered. This method excluded topical and intra-articular prescriptions.
- The data retrieved were summarised in an Excel document. This demonstrated the only critically important antibiotics administered were cefovecin, and the fluoroquinolones marbofloxacin and enrofloxacin.
- The total number of cases receiving critically important antibiotics was calculated for each year from 2019 to 2022.

- The total number of appropriate and inappropriate prescriptions was calculated by reviewing the culture results and any clinical justification comments on the clinical record.

- The total number of antibiotic prescriptions for each individual clinician and hospital department was also calculated.

- The results were reported back to the teams, with individualised emails sent to departments or individuals asking them to reflect on their decision-making and consider whether an alternative antimicrobial would have been appropriate.

Results

Assessing the retrospective data since the start of the audit in 2019 has shown an overall reduction in the percentage of cases prescribed fluoroquinolones (FQ). There has also been a reduction in the percentage of cases prescribed inappropriate fluoroquinolones:

- The percentage of cases prescribed an FQ has reduced from 1.18% to 0.75%
- The percentage of cases prescribed an inappropriate FQ has reduced from 28.5% to 9.1%.

	2019	2020	2021	2022
Number of new cases	2625	3199	4562	4398
Number of cases prescribed systemic FQ	31	33	46	33
% of cases prescribed systemic FQ	**1.18**	**1.03**	**1.01**	**0.75**
Number of cases that FQ use was considered inappropriate after review	8	4	7	3
% inappropriate	25.81	12.12	15.22	9.1

Figure 2: Table demonstrating the total number of cases and percentage of prescribing incidents for systemic fluoroquinolones.

At the launch of the AMS group, cefovecin was no longer kept in stock. It was prescribed only once in 2019 which was inappropriate, and again in 2022 in an appropriate situation based on culture and susceptibility testing indicating it as the most appropriate antimicrobial to use.

Impact of intervention

The annual audit and implementation of new guidelines that all critically important antimicrobial prescriptions are to be discussed with the AMS Team and justification written in the clinical record has seen a reduction in the amount of FQ prescriptions. The knock-on effect has seen a slight reduction in revenue from sales of FQ antimicrobials because of improving antimicrobial stewardship. This is a negligible amount and is not expected to significantly impact overall sales.

A significant outcome is a change in the prescribing culture at this hospital. This has developed by improving communication and teamwork allowing a more open environment to discuss decision-making around antimicrobial prescription. A member of the AMS team is involved and consulted with most clinical decisions when an FQ prescription is being considered. All colleagues, including the nursing team and patient care assistants, receive further continual professional development (CPD) to deepen understanding about the appropriate use of antimicrobials and are encouraged and empowered to respectfully question the use of critically important antimicrobials and expect robust justification from the prescribing clinician.

CPD events are delivered to further hospitals within the Linnaeus Group to support them in designing their own tailored approach to antimicrobial prescription using the PROTECT ME poster as a starting point.

Promotion of the teams' antibiotic guardian pledge and initiative on social media, on the practice website, and newsletter allowed clients and the wider community to see their approach to AMS, helping to drive client engagement with the Antibiotic Amnesty throughout November 2022.

The initiative is maintained as an ongoing audit performed annually. This allows comparison to previous years. The publication of these results during clinical meetings facilitates targeted, ongoing education and reflection to continue to improve and safeguard the use of critically important antimicrobials.

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Summary

Clinical audit is a process for monitoring standards of clinical care to see if it is being carried out in the best way possible, known as best practice.

A clinical audit can be described as a systematic cycle. It involves measuring care against specific criteria, taking action to improve it, if necessary, and monitoring the process to sustain improvement. As the process continues, an even higher level of quality is achieved.

What the clinical audit process is used for

A clinical audit is a measurement process, a starting point for implementing change. It is not a one-off task, but one that is repeated regularly to ensure ongoing engagement and a high standard of care.

It is used:

- ⇒ To check that clinical care meets defined quality standards.
- ⇒ To monitor the changes made to ensure that they are bringing about improvements and to address any shortfalls.

A clinical audit ensures concordance with specific clinical standards and best practices, driving improvements in clinical care. It is the core activity in the implementation of quality improvement.

A clinical audit may be needed because other processes point to areas of concern that require more detailed investigation.

A clinical audit facilitates a detailed collection of data for a robust and repeatable recollection of data at a later stage. This is indicated on the diagram wherein in the 2nd process we can see steps 4, 5 and 6 repeated. The next page will take you through the steps the practice took to put this into practice.

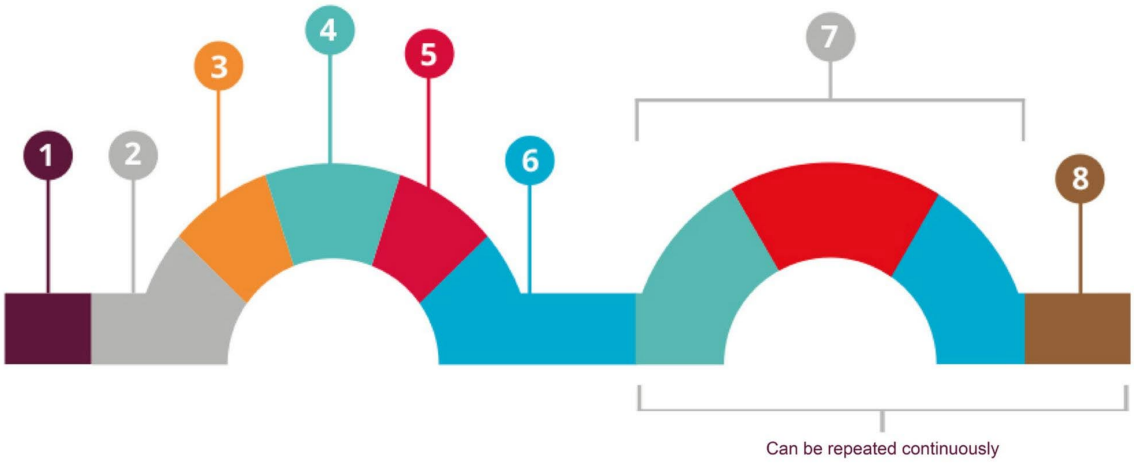

Figure 1: The Veterinary Clinical Audit Cycle by RCVS Knowledge. Available from www.rcvsknowledge.org. Developed by the Royal College of General Practitioners www.rcgp.org.uk/qi-ready

1. Choose a topic relevant to your practice

   The topic should be amenable to measurement, commonly encountered and with room for improvement. The successful reduction of the total critically important antibiotic prescriptions and preventing inappropriate antimicrobial use.

2. Selection of criteria

   Criteria should be easily understood and measured. Retrospective data from every systemic prescription of a critically important antibiotic was gathered, topical and intra-articular prescriptions were excluded from the audit.

3. Set a target

   Targets should be set using available evidence and agreeing best practices. The first audit will often be an information-gathering exercise, however, targets should be discussed and set. There were written guidelines but no pre-audit data available to assess the effectiveness of these guidelines. The target of this initiative was to assess and report on prescribing habits. The principles of 'Plan, Prevent, Protect' were used to educate, promote constructive discussion, drive culture change, and

establish whether corrective measures need to be implemented to improve prescribing habits and prevent inappropriate antimicrobial usage on an ongoing basis.

4. Collect data

Identify who needs to collect what data, in what form and how. A team of volunteers formed the Antimicrobial Stewardship Team, with a practice-wide pledge to become antibiotic guardians. Tasks to gather data retrospectively were divided between team members, including both veterinary surgeons and registered veterinary nurses.

5. Analyse

Was the standard met? Compare the data with the agreed target and/or benchmarked data if it is available. Note any reasons why targets were not met. These may be varying reasons and can take the discussion from the entire team to identify. A reduction in the percentage of cases prescribed fluoroquinolone (FQ) from 1.18% to 0.75% was achieved. The percentage of cases prescribed an inappropriate FQ was also reduced from 28.5% to 9.1%.

6. Implement change

What change or intervention will assist in the target being met? Develop an action plan: what has to be done, how and when? Set a time to re-audit. New guidelines for all critically important antimicrobial prescriptions to be discussed with the AMS Team and justification written in the clinical record were implemented, along with ongoing training for all team members and promotion of the initiative for client education.

7. Re-audit

Repeat steps 4 and 5 to see if changes in step 6 made a difference. If no beneficial change has been observed then implement a new change and repeat the cycle. This cycle can be repeated continuously if needed. Even if the target is not met, the result can be compared with the previous results to see if there is an improvement. The retrospective audit has collected data over a four year period, with a steady reduction in the use of fluoroquinolone each year.

8. Review and reflect

Share your findings and compare your data with other relevant results. This can help to improve compliance. Publishing and sharing of these results with clinical teams facilitates targeted, ongoing education and reflection to continue to improve and safeguard the use of critically important antimicrobials.

References

1 BSAVA (2022) *Protect Me*. [Online] Available at: https://www.bsava.com/resources/veterinary-resources/protect-me/