Reduction of highest priority critically important (HPCIA) antibiotic use

RCVS Knowledge Antimicrobial Stewardship Award Champion 2025

Animal Trust Dewsbury

Introduction

Animal Trust Dewsbury aimed to reduce their use of highest-priority critically important antibiotics (HPCIAs) and ensure that any use was in line with current best practice. Using continuous surveillance of HPCIA prescriptions and several full audit cycles, they were able to make gradual changes to update practice guidelines on the use of HPCIAs. These changes included an increased use of culture and sensitivity testing, new stock control measures for HPCIAs and an increase in stocking of alternatives to HPCIAs. By the end of the project, the prescription rates for HPCIAs fell from 3% to just 0.46% of all consultations.

The team used the principles of 'Plan, Prevent, Protect' to help guide their initiative:

Plan: An underlying assumption of this project was that most HP-CIA prescriptions were inappropriate and resulted from veterinarian-led decisions. Therefore, education of the clinical team to improve this decision making was a pivotal first step.

Prevent: Evidence-based alternatives to HPCIAs were identified and stocked, and changes to which HPCIAs the practice stocked were made to provide alternatives and introduce barriers to inappropriate HPCIA prescription. Use of culture and sensitivity prior to HPCIA prescription was also prioritised.

Protect: This project aimed to improve antimicrobial stewardship (AMS) and protect HPCIAs by reducing their use over the 12-month project.

1. Choose a topic relevant to your practice

The topic should be amenable to measurement, commonly encountered and with room for improvement.

a. What topic was chosen?

To assess how many times each HPCIA were prescribed by the practice and if these prescriptions were appropriate given current best practice guidelines.

b. Why was this topic chosen?

Stewardship of HPCIAs should be a priority for all medical professions, as these drugs are critical for human health, and irresponsible veterinary prescription could have detrimental effects for human, animal, and environmental health. Additionally, the RCVS practice standards scheme (PSS) has strict requirements for HPCIA prescription, and the practice is a member of the PSS[4].

2. Selection of criteria

Criteria should be easily understood and measured.

a. What criteria was used?

Any consultation that included a prescription of a HPCIA (fluoroquinolone, cefovecin, polymyxin B) made at Dewsbury Animal Trust CIC during a set time period (different for each audit cycle, but effectively continuous from May 2023 to May 2024) regardless of species was included in 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.

a. What target was set?

1. An overall absolute and relative (to number of consultations) reduction in HPCIA prescriptions.
2. Zero prescriptions of HPCIAs without culture and sensitivity results indicating they were necessary (except in exceptional circumstances per PROTECT ME [1]).
3. Discontinuing stocking of long-acting injectable antibiotic (cefovecin) and topical HPCIAs.

b. What evidence was used to define the target?

This is based on best practice from the BSAVA[1], WHO[2], European Medicines Agency[3], and RCVS Practice Standards Scheme[4].

4. Collect data

Identify who needs to collect what data, in what form and how.

a. When was the data collected?

Initial data was collected in May and June 2023.

b. What data was collected?

- Number of times each HPCIA was prescribed.
- Number consultations performed.
- Therapeutic purpose for HPCIA prescription (condition being treated).
- Species of patient being treated.
- Whether culture and sensitivity (C&S) had been performed.
- The prescriber.

c. Who collected the data?

Tighearnan Mooney - Lead Veterinary Surgeon

d. How was the data collected?

The clinical audit was completed using the practice management system to retrospectively gather data from consultations involving prescription.

e. Results:

- Quantitative assessment:
    - HPCIAs were prescribed in **3.05%** of all consults.
        - Fluoroquinolones were prescribed in **1.24%** of all consults.
        - Cefovecin was prescribed in **1.81%** of all consults.
- Qualitative assessment
    - Topical fluoroquinolones were often prescribed empirically at first presentation with no justification given.
    - Systemic fluoroquinolones were often prescribed to exotics (small mammals).
    - Valid empirical fluoroquinolone use was noted (prostatitis cases, though C&S was also performed in many of these cases).

- Cefovecin was frequently prescribed at first presentation for uncomplicated cases.
- It was very rare for a clinical justification for use of cefovecin to be recorded in the clinical record.

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.

c. Was the target met, if not, why not?

At this initial stage, the target was not met, as only baseline data had been collected. It showed that prescriptions for HPCIAs were being given without culture and sensitivity results. A baseline figure for the percentage of HPCIA prescriptions relative to consult numbers had been obtained.

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.

a. What changes were introduced?

Evidence-based alternatives to HPCIAs were identified and stocked, and stocking of first line alternatives increased. Changes to which HPCIAs the practice stocked were made to provide alternatives and introduce barriers to inappropriate HPCIA prescription. The use of culture and sensitivity prior to HPCIA prescription was also prioritised, increasing the requirement for a specific indication to use them.

b. What was the overall action plan?

Once the baseline data had been collected, a whole team meeting was held to discuss the results. It was decided to initially ask for voluntary improvements in HPCIA stewardship through a team commitment to being conscientious of HPCIA use and including more detail in clinical notes to aid with further auditing cycles. We then assessed this to see if this approach resulted in a significant enough improvement. If an insufficient improvement was made, incremental changes would be implemented to make it easier to prescribe 1st and 2nd line antimicrobials, and more difficult to prescribe HPCIAs empirically. As it was unclear what exact changes would be needed at the beginning of the project, all changes made were

based on suggestions from the clinical team throughout, which improved buy in with the project.

c. When was a re-audit planned?

Surveillance was continually performed, and full audits were planned to be performed every 2 months, however, this timeline was not possible due to competing time demands.

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 them 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.

a. When did the re-audit take place?

Multiple audit cycles were performed throughout the project. A further 4 re-audits were completed between June 2023 and May 2024.

b. What data was collected for the re-audit?

The same information was collected:

- Number of times each HPCIA was prescribed.
- Number consultations performed.
- Therapeutic purpose for HPCIA prescription (condition being treated).
- Species of patient being treated.
- Whether culture and sensitivity had been performed.
- The prescriber.

As fewer prescriptions were made, more case specific details were assessed to determine if the prescription was appropriate.

c. Who collected the data?

Tighearnan Mooney - Lead Veterinary Surgeon

d. How was the data collected?

The same data collection method was used as the first audit and was completed using the practice management system.

e. Results:

Audit 2:

- Quantitative assessment:
    - HPCIAs were prescribed in **1.62%** of all consults.
        - Fluoroquinolones were prescribed in **0.88%** of all consults.
        - Cefovecin was prescribed in **0.74%** of all consults.
- Qualitative assessment:
    - In keeping with the agreements made during clinical meetings, permanent vets now record reasons for prescribing HP-CIAs in their notes. For cefovecin this is often due to supporting clients who struggle to medicate their pets.
    - Fluoroquinolone use in exotics (small mammals) remained high.

Audit 3:

- Quantitative assessment:
    - HPCIAs were prescribed in **1.15%** of all consults.
        - Fluoroquinolones were prescribed in **0.89%** of all consults.
        - Cefovecin was prescribed in **0.066%** of all consults.
        - Polymyxin B was prescribed in **0.23%** of all consults
- Qualitative assessment: (suboptimal recording has impaired qualitative assessment during this audit)
    - Use of topical fluoroquinolones reduced during this audit period. The clinical team agreed to no longer routinely stock these products; they are now ordered in for patients as needed, based on culture and sensitivity or treatment failure.
    - Use of systemic fluroquinolones for small mammals has reduced in this audit period as the practice started to stock TMPS liquid suspension.
    - Vets continued to write justifications for cefovecin use in their notes until this drug was no longer available. This may be a useful measure to introduce at different sites where similar changes are sought.

Audit 4

- Quantitative assessment:
    - HPCIAs were prescribed in **0.46%** of all consults, a huge **84.9%** decrease!
        - Fluoroquinolones were prescribed in **0.4%** of all consults.
        - Cefovecin was prescribed in **0%** of all consults.
        - Polymyxin B was prescribed in **0.05%** of all consults.
- Qualitative assessment had not been performed at the time of submission as the audit was on going.

f. Was the target met, if not, why not?

1. By the audit cycle 4, we had reached our target of an absolute and relative reduction in the number of HPCIAs prescribed. Several of these drugs are no longer kept in stock and are only ordered in when required, based on culture and sensitivity results.
2. We partly achieved our second target of zero HPCIAs being prescribed without justification from C&S testing. There are still some exceptional cases where HPCIAs are prescribed without C&S testing (e.g. prostatitis). There are also some cases identified where culture and sensitivity has been performed, but where appropriate alternatives to HPCIAs were not prescribed.
3. We met our third target of no longer stocking long-acting injectable antibiotics and topical HPCIAs.

g. Were any further changes implemented?

Initially empirical use of HPCIAs remained common for exotic patients and in cases of otitis externa. However, after further changes to practice guidelines were introduced, this reduced dramatically. The success of this project lead to Animal Trust's Clinical Governance team pushing for improved HPCIA stewardship across all branches. This has been successful, and they now release an internal quarterly report on HPCIA use. This has resulted in the creation of new metrics which will aid ongoing surveillance of HPCIA usage at Dewsbury, as well as being useful for benchmarking and for similar antimicrobial stewardship initiatives in the future.

8. Review and reflect

Share your findings and compare your data with other relevant results. This can help to improve compliance.

a. At what stages were the team involved?

The project was initiated by Tighearnan Mooney. Once the baseline prescribing habits had been identified and shown to be contra to the guidelines, a meeting was held with the clinical team to discuss how the practice needed to change. From this point on the clinical team (vets and nurses) were regularly updated of audit findings and were involved in discussions about how to change prescribing practice and what changes would be made.

b. How were the team involved?

Regular clinical meetings were held where the input and opinions of the team were sought. Members of the nursing team were integral to implementing changes in stock control, and both vets and nurses made suggestions on how to make using alternatives to HPCIAs easier.

c. Did the team need any support? How was this given?

Some changes were agreed to without issue and rapid progress was seen (e.g. the decision to no longer stock certain medications was made unanimously very early on). Other changes were made more gradually by increasing availability of alternatives and by identifying a discounted C&S panel provided by a commercial lab. The decision to stop stocking cefovecin was the most difficult, with multiple members of the team wanting to stock it just in case it was needed. To help reduce the need for this drug we increased our stocking levels for different formulations of antimicrobials (e.g. tablets, oral liquid suspensions, and capsules) to ensure we have a formulation which would be more accessible for our patients and clients. The team only agreed to stop stocking cefovecin after the drug was not used for three consecutive months despite being available in the practice.

d. What barriers did the project face, and how were they overcome?

The primary barrier faced in this project was the inertia of individual's habits and the opinion that HPCIA stewardship was not a priority. Another barrier was a lack of buy-in by locum veterinarians who needed further guidance on practice polices and guidelines (i.e. no HPCIA ear preparations available for empirical use or cefovecin not being stocked).

e. What surprised you about this audit?

Although the project lead knew from experience that it was possible to practice without stocking cefovecin he was surprised by how quickly this change could be made and accepted by the team. This was very much facilitated by excellent project buy in by the head nurse who made decisions about stock control and what drugs were ordered in. The project lead would advocate strongly for a lead/head nurse to take on an antimicrobial guardianship role in any practice trying to improve their antimicrobial stewardship.

f. What consideration has been given for Human Factors?

This entire project has been based on the idea that inappropriate HPCIA prescriptions is a human decision based on a pattern of behaviour which makes HPCIA prescription easier, especially when these products are readily available at the time of consultation. To improve HPCIA stewardship we addressed these human factors through practice policy and guidelines, clinical team education, and by reducing the availability of these drugs.

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.

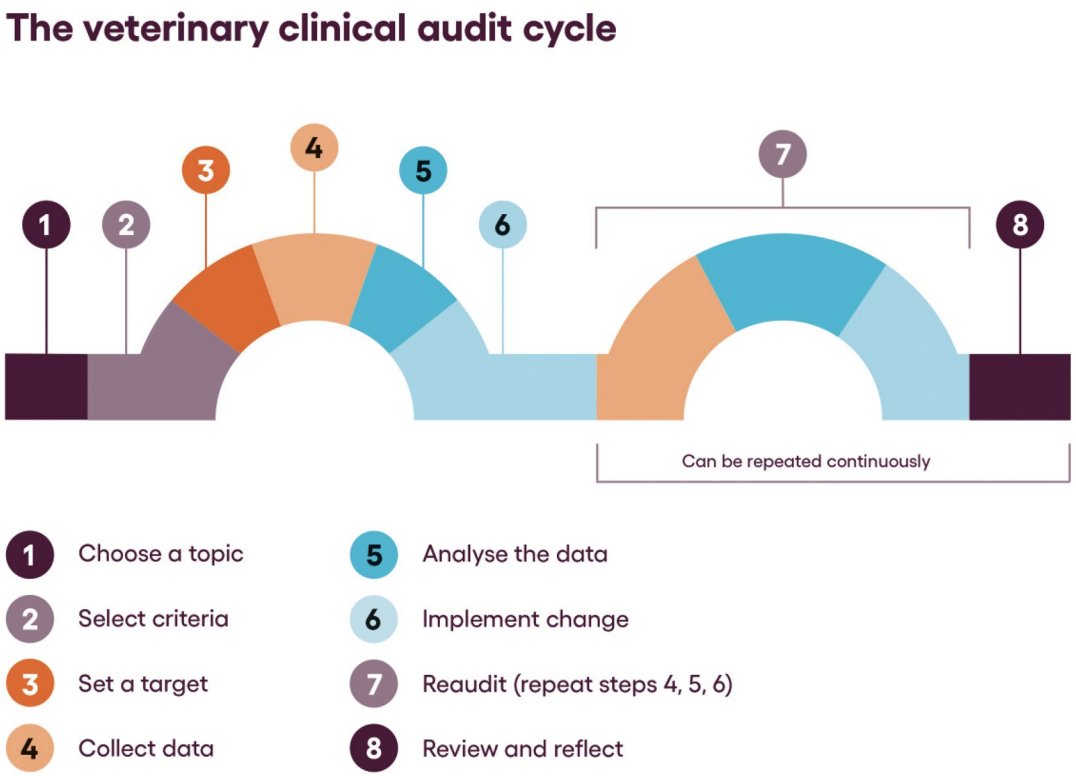

Figure 1: The Veterinary Clinical Audit Cycle by RCVS Knowledge. Available from www.rcvsknowledge.org. Developed by the Royal College of General Practitioners www.rcgp.org.uk/qi-ready

References

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