

Clinical Audit Case Example: Post-operative temperature in cats and dogs

Name of initiative: Post-operative temperature in cats and dogs
Initiative start date: February 2020
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Introduction

Over the past few years our practice's parent company, CVS, have embraced QI. They have rolled out training and driven QI forward in their practices. As a result of this, I was motivated to complete the Clinical Audit module of the CertAVP and this clinical audit formed part of the module. This audit was carried out in a first opinion small animal practice with a caseload that comprises 95%+ cats and dogs. There is a team of five vets and six veterinary nurses (including student veterinary nurses) carrying out the clinical work.

Patient warming devices that were available before January 2019 included heat pads and bubble wrap, as well as an incubator that could be used for smaller patients in recovery. It had been noted anecdotally that some patients were recovering more slowly from anaesthesia than expected and that often this was because they were hypothermic. Therefore, in January 2019, a warm air circulation blanket (WACB) was purchased to assist patient warming during the peri-operative period. The team felt that this was an appropriate area for a first formal clinical audit in the practice, due to concerns over patient temperatures in the post-operative period and due to the recent purchase of the WACB.

Aims of the clinical audit

The aim was to ensure that canine and feline patients were being effectively warmed peri-operatively, leading to an adequate body temperature when entering recovery from anaesthesia.

1. Conduct an outcome audit to establish whether patients are adequately warm on recovery from anaesthesia.
2. Conduct a process audit to establish whether the WACB purchased a year ago is being used.
3. Conduct an outcome audit to establish whether the purchase of the WACB has resulted in an improvement in post-operative patient temperatures.

Actions

Team Selection

The nursing team were consulted during the selection of the aim and objectives of the audit. The nursing team are the main colleagues responsible for temperature monitoring and maintenance during anaesthesia. As the main users of the anaesthetic charts, the nurses were also able to advise on whether the data required would be easily accessible. The nursing team assisted with the collection of the anaesthetic charts that contain the data.

Data Collection

Sample selection

To select a group of patients that would be large enough to draw meaningful conclusions from the data, all canine and feline anaesthetics were considered. Rabbits and other exotic species have different core temperatures, are anaesthetised differently, and are less common in the practice, so were excluded from this audit at the outset.

In order to limit variation in the sample that might affect the post-operative temperature for reasons other than ineffective warming, the following factors were considered:

- Health status before anaesthesia
- Anaesthesia duration
- Anaesthesia protocol.

The practice has protocols in place for routine neutering procedures, these are healthy patients with relatively short procedures, so were selected as the sample.

This audit assessed the impact the purchase of a WACB had on patients' post-operative temperatures. The practice only uses the WACB in theatre, so cat castrations were excluded from the data as they are carried out in the prep room. Therefore, the audit included data from cat spays, dog castrates and bitch spays only. The only further exception was neutering carried out as part of treatment for another condition, for example pyometra surgery, as these patients are sick, and this could affect their thermoregulation.

Data was collected retrospectively due to time constraints.

As the data was contained in paper records, collection of all available data was too time-consuming. Therefore, data was collected from the same months in the year before the WACB was purchased and the year afterwards, which should limit the impact of environmental temperature. A pilot data collection of one month was carried out and this established that there was sufficient time to collect two months' worth of data to give any conclusions more validity.

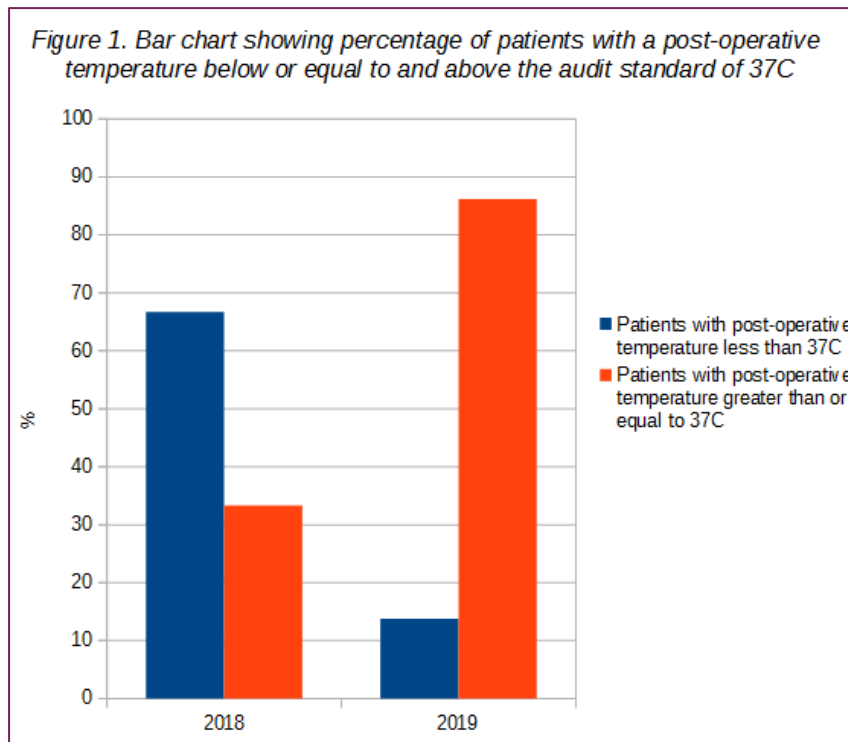
The Clinical Audit module run at the University of Liverpool directs students to a variety of resources for QI learning as well as being an excellent resource in its own right. RCVS Knowledge is a key resource and the online module in QI provided a wealth of information. The YouTube videos created at the RCVS Knowledge EBVM Skills days in 2015 were also useful. The EBVM learning tutorials on the EBVM Network were useful alongside the Healthcare Quality Improvement Partnership eLearning module. NICE also publish some useful resources that can be applied to the veterinary setting.

Results

Data Analysis

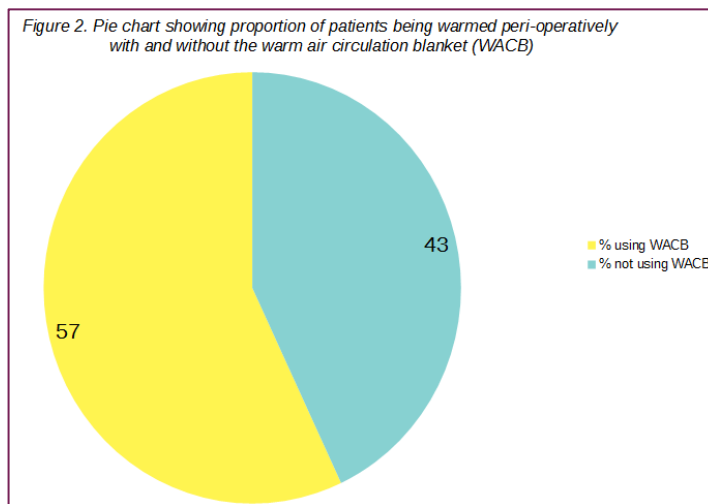
- In total, 26 dogs and cats were included in the 2018 sample and 31 in the 2019 sample.
- In 2018, post-operative temperature was not recorded in 13/26 (50%) of patients. This improved to 2/31 (7%) in 2019.
- In 2018, 4/12 (13%) of patients had a post-operative temperature at or above 37°C, this figure improved to 25/29 (86%) in 2019.

Figure 1 shows the improvement in post-operative temperature between 2018 and 2019.



- In 2019, the warming device used was not specified in 10/31 (32%) of cases.
- In those patients in which the warming device was recorded, 12/21 (57%) were being warmed with the WACB.

Figure 2 shows the proportion of patients being warmed with the WACB.



- In 2019, 10/31 (32%) of patients met both audit standards, they were warmed with the WACB and had a post-operative temperature of 37°C and above. For this calculation, it was assumed that where the warming device was not specified, these patients were not warmed with the WACB.
- A Mann-Whitney test identified that the post-operative patient temperatures were significantly greater in 2019 (median = 37.5°C) than in 2018 (median = 36.5°C), U=99 p<0.05.
- Fisher's Exact Test identified that there were significantly more patients recovering with a temperature of 37°C and above in 2019 than in 2018, p<0.05.

1. Are 100% of patients' temperatures 37°C or above on recovery from anaesthesia?

No. In 2019, 86% of patients are 37°C or above on recovery from anaesthesia. This falls short of the standard of 100%.

Possible causes:

- The WACB is not being used in all cases.
- The patient's temperature is not being monitored carefully enough to detect a requirement for more intense warming measures.
- Some procedures included in the sample were of a longer duration than expected due to an inexperienced surgeon. The temperature of a patient that has been anaesthetised for longer will be more challenging to maintain.

2. Is the WACB purchased a year ago being used in 100% of theatre anaesthetics?

No. 57% of patients were warmed with the WACB, this is below the standard of 100%.

Possible causes:

- The WACB is not being set up in advance, so it is not being used in all required cases. Once a patient is anaesthetised, the nurse responsible for monitoring the anaesthetic does not then set up the device due to her requirement to monitor the patient and assist the surgeon.
- Occasionally there are no clean blankets ready to be used with the device.
- The entire nursing team are not aware of the positive impact the WACB can have on patient temperature.

3. Has the purchase of the WACB resulted in a statistically significant improvement in post-operative patient temperatures?

Yes. Patients are recovering at a significantly higher temperature and more patients are recovering at 37°C or above since the purchase of the WACB.

Impact of Intervention

The most positive finding of this audit is the significant improvement in patient post-operative temperature in 2019 compared with 2018. Whilst all the standards have not been met, there is an obvious move towards them. Repeating the audit will establish whether this trend is continued, as this is the first round of the audit cycle, we expect there to be some areas for improvement.

Action points

1. Practice agreement on a definition for post-operative temperature.
2. Record post-operative temperature in all cases in the specified place on the anaesthetic chart.
3. Record warming device used in all anaesthetics.
4. Create a written protocol for the use of the WACB that requires its use in all theatre procedures unless explicitly contraindicated.
5. Train all clinical staff in the importance of using the WACB and the positive impact it can have on patient care.
6. Consider purchasing additional blankets for use with the device.

The outcomes of this audit are relevant to day-to-day practice and the patients at the practice. The action points are not expensive or arduous to implement and therefore this audit should have a positive impact on patient care at the practice. The action points should also mean that the data collected at follow-up audits is more reliable and complete.

This audit was planned with the practice team. This has ensured team investment in the audit outcome and should encourage team members to participate in future audits.

We had planned a team meeting for the dissemination of findings, to discuss the action points, and come to a collective agreement and subsequent delegation of tasks. A plan for following up the audit with further data analysis and monitoring of changes was also going to be put in place. However, due to the impact of the coronavirus pandemic on the practice, it has not been possible to have the team meeting yet. The findings of the audit have been relayed to the Head Nurse so she is aware of them and there will be a team meeting in the coming months to restart the audit cycle.

Establishing a culture of evidence-based veterinary medicine - EBVM - and continual improvement is a goal in this practice. Involving stakeholders in the planning of future audits and setting up a re-audit cycle 'audit by audit' may help to establish a new culture. Putting plans in place to facilitate easy and continuous data collection going forward, planning the time to analyse the data into the diary, as well as making sure that each team meeting includes an agenda item on discussing recent audit findings and ideas for future areas of focus, should also help to change the practice culture.

We anticipate that the impact of this audit will primarily be a positive impact on animal care. This improvement in patient recovery time from surgery should also improve the flow of procedures through the practice. This may increase the number of procedures that can be done, therefore improving animal welfare by reducing wait times for patients, improving client service, and resulting in cost efficiency savings. Other positive impacts include improving the clinical care offered, which gives the team more inherent pride in their work and a better experience; this may improve staff retention. Our changes should also improve data collection from our general anaesthetic sheets.

Overall, the staff may see many improvements because of the audit, which should hopefully help to increase engagement in the subject area and as a result continue the cultural shift in the practice towards a QI culture. This may also improve retention and recruitment in its own right.

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.

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 practice, 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 where 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.

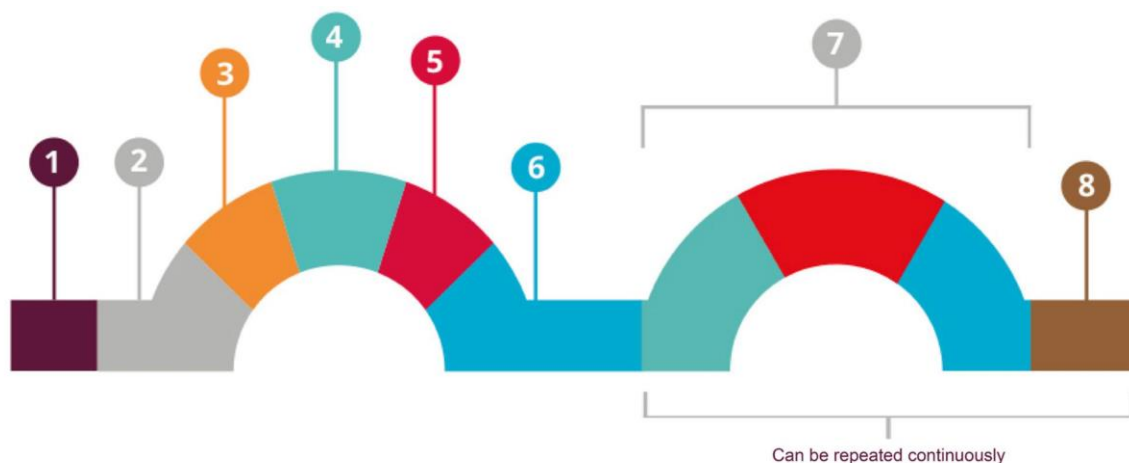


Figure 1: The Veterinary Clinical Audit Cycle by RCVS Knowledge. Available from www.rcvsknowledge.org. Developed by the Royal College of General Practitioners www.rcgp.org.uk/qi-ready

1. Choose a topic relevant to your practice

The topic should be amenable to measurement, commonly encountered and with room for improvement. The practice performed an audit on post-operative temperature to see if the new equipment purchased as having a positive effect.

2. Selection of criteria

Criteria should be easily understood and measured. For this audit, temperatures were taken and recorded from dog and cat neuters. This was to avoid other variables potentially caused by different species or disease processes.

3. Set a target

Targets should be set using available evidence and agreeing on best practice. The first audit will often be an information-gathering exercise, however, targets should be discussed and set. Two main targets were set: 100% of patients' temperatures 37°C or above on recovery from anaesthesia and the WACB being used in 100% of theatre anaesthetics.

4. Collect data

Identify who needs to collect what data, in what form and how. Data was collected by the veterinary nursing team and compared with data collected retrospectively.

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 discussion from the entire team to identify. Although the audit targets were not met, the audit showed that the WACB was improving post-operative temperatures in dogs and cats. The audit also allowed for discussion on what the potential barriers were.

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. The team discussed several changes, that lead to the purchase of further equipment, protocols to be developed, and overall, the team working towards the same goals.

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 audit showed that the monitoring of post-operative temperatures had improved by 43% and patients recovering with a temperature at or above 37°C improved by 73%.

8. Review and reflect

Share your findings and compare your data with other relevant results. This can help to improve compliance. Findings and updates to protocols are regularly given to the team.

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