

Clinical Audit Case Example: Post-operative Temperature Audit

Name of the initiative: Post-operative Temperature Audit
Initiative start date: January 2021
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Introduction

Donview Veterinary Centre is a mixed GP veterinary practice. In January 2021 the practice carried out a Quality Improvement Project. After discussion with the veterinary nursing team, it was recognised that improvement with in-patient care was necessary as some patients returned to their kennel following their procedure with a low body temperature.

Aims of the clinical audit

An initial audit was performed to obtain data and to act as a benchmark for the practice. Our target was to have the majority of our patients returning from their procedures within the normal temperature range or only mildly hypothermic (from the hypothermia classifications, mild (37.0-37.7 degrees Celsius), moderate (35.8-37.0 degrees Celsius), severe (33.6-35.8 degrees Celsius) and critical (≤ 33.6 degrees Celsius)¹). This audit would also help us to address areas of the practice with unexpected hypothermia and put measures in place to improve patient temperatures. This would help to improve the quality of care at Donview.

Actions

The initial audit began with the data collection process. Temperatures, collected by rectal thermometer during the post-operative period immediately upon settling in the recovery area and repeated every 15 minutes in patients showing signs of hypothermia until normothermic, were recorded onto a spreadsheet. These were then compared against the normal species temperature range (dog 37.9-39.9 degrees Celsius, cat 38.1-39.2 degrees Celsius, rabbit 38.6-40.1 degrees Celsius)² and classified. Data was collected by the team of Registered Veterinary Nurses.

Results

Data was collected for 31 patients, 20 dogs and 11 cats.

The average temperature for each species was calculated and fell into the mild hypothermia category. Whilst the average results are not initially alarming, **42% of patients remained normothermic but 58% of the overall patients used in the audit did experience post-operative hypothermia which could have been prevented.**

Results for these 58% of patients experiencing hypothermia were further scrutinised against the hypothermia subclassifications (mild, moderate, severe, and critical) and showed:

Canines:

- 50% had severe hypothermia,

- 20% had moderate hypothermia,
- 30% had mild hypothermia.

Felines:

- 25% had moderate hypothermia
- 75% had mild hypothermia.

Results of this audit were delivered to the team, and ways to improve post-operative temperatures were discussed. The discussions included:

- Causes of heat loss from patients undergoing surgery. It was generally agreed that further attention should be given to these areas
- Patient warming methods already utilised in practice. This included active methods such as the forced air warming system, electric heat pads and microwavable heat pads. The passive methods included use of vet bed fabric, blankets, insulated mattresses, and bubble wrap on paws.

During the discussion the team also recognised missed opportunities to warm patients must have occurred and they concluded to do better.

The audit highlighted the need for creating a standard operating procedure (SOP) to provide guidance on a multimodal approach to prevent in-patient hypothermia, allowing consistency of care and to enable further training in the multi-disciplinary team on basic but imperative measures to prevent heat loss.

Other interventions discussed by the practice in addition to the SOP were:

- A mattress for the x-ray table in the diagnostic imaging room to prevent patients from being placed directly on a cold table.
- A more efficient cover, such as a Thermo-Blocker, to be added to the prep-room table.
- Veterinary specific aural thermometer
- Veterinary infusion fluid warmer
- Forced air warmer
- Anaesthetic monitoring chart to be modified to include space for temperature recordings in 5-minute intervals. This would allow for readings to be recorded clearly and concisely along with the method of how it was collected for example: tympanic membrane temperature (TMT), rectal temperature (RT) or oesophageal temperature probe (OTP). Prior to modification temperature could only be recorded pre- and post-operatively, but not during the anaesthetic.
- An in-patient RVN and VCA were assigned daily to ensure in-patient vital signs were being monitored, recorded, reported and appropriate intervention put in place if necessary. This allows for continuity of in-patient care and improved efficiency in roles and communication between staff, ultimately resulting in the delivery of better quality of care.

A repeat audit was carried out in April 2021 to assess the impact of the interventions. Data was collected from 37 patients, 28 dogs and 9 cats. These temperatures, collected using a rectal thermometer in the same manner as the initial audit, were recorded onto a spreadsheet and compared against the normal species temperature range and classification in the same way as the first audit had been conducted to ensure continuity.

Results showed an increase in the average temperature for both species, 0.7 degrees Celsius for dogs and 0.6 degrees Celsius for cats. The average temperatures for each species were calculated, which showed **30% of canines and 0% of felines experienced post-operative hypothermia.**

The results for 30% of canines experiencing hypothermia were further scrutinised against the hypothermia subclassifications and showed:

- 0% had severe hypothermia,
- 7% had moderate hypothermia,
- 21% had mild hypothermia.

Impact of intervention

The outcome of this project was that the team embraced and shared the same ethos and commitment to improve patient care. Carrying out the quality improvement cycle allows the efforts to be measured, assessed and appropriate interventions put in place to enhance patient welfare. By regularly repeating the measurement process, this ensures ongoing engagement and a high standard of care. The newly developed SOP was well received and has resulted in subsequent development of SOPs across the team as they strive for continuous improvement. In fact, to date approximately 20 new SOPs, protocols and guidelines have been developed within the practice. These include operational instructions for the newly implemented inline vet fluid warmer and forced air warmer and guidance to maintain a reasonable ambient temperature in the theatre and hospitalisation environments.

Overall, embracing QI and clinical audits has improved patient care and clinical outcomes, has motivated the team, and given them an understanding of QI and the benefits it can have. Results allowed for investment and overall better understanding of resources and equipment.

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.

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Template provided by RCVS Knowledge | www.rcvsknowledge.org/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.

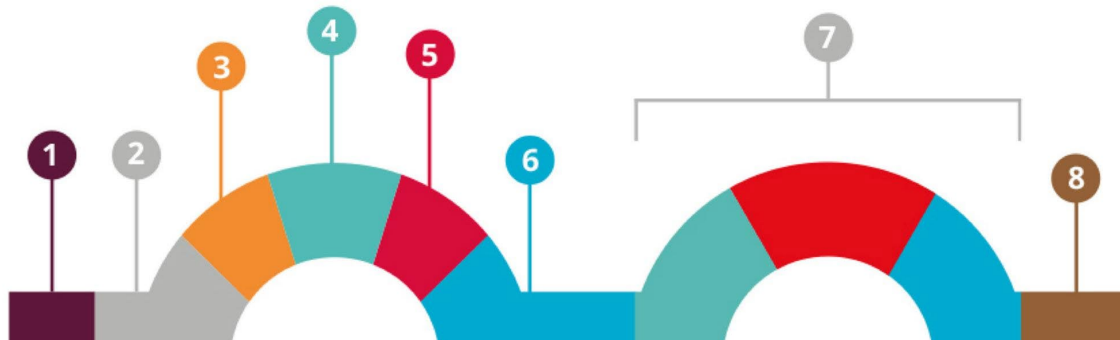


Figure 1: The Veterinary Clinical Audit Cycle by RCVS Knowledge. Available from www.rcvsknowledge.org. Developed by the Royal College of General Practitioners www.rcgp.org.uk/qi-ready

Can be repeated continuously

1. Choose a topic relevant to your practice

The topic should be amenable to measurement, commonly encountered and with room for improvement. Practice discussions recognised some patients experienced low body temperatures following surgery.

2. Selection of criteria

Criteria should be easily understood and measured. All patients undergoing surgery have temperature monitored pre and post operatively.

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. The majority of patients remain normothermic or only mildly hypothermic during surgery.

4. Collect data

Identify who needs to collect what data, in what form and how. The initial data collection process was carried out by Registered Veterinary Nurses over a 1-week period, using digital rectal thermometers and analysed using the normal species temperature range and the temperature reference range for the subclassifications of hypothermia.

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. The initial audit showed 42% (13/31) of patients remained normothermic and that 58% (18/31) of patients experienced preventable post-operative hypothermia.

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 various methods of preventing heat loss and identified areas within practice where missed opportunities had occurred. This led to the creation of SOP's, the purchase of more equipment and further team training.

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. A repeat audit after 3 months showed increased average temperatures for both species, 0.7°C for dogs and 0.6°C for cats, with 30% of dogs and 0% of cats experiencing post-operative hypothermia.

8. Review and reflect

Share your findings and compare your data with other relevant results. This can help to improve compliance. Continued cycle of room temperature audits and annual veterinary nurse led audit programme of the standard operating procedures (SOP) and protocols to ensure robust quality assurance for the practice.

¹Quandt, J. (2018) Hypothermia in the operating room. *Today's Veterinary Practice*, 8 (3), pp. 70-74. Available from: <https://todaysveterinarypractice.com/anesthesiology/hypothermia-in-the-veterinary-operating-room/>

²Felder, S.E. (2015) *Normal rectal temperature ranges*. [MSD Veterinary Manual] [Online]. Available from: <https://www.msdrveterinarymanual.com/special-subjects/reference-guides/normal-rectal-temperature-ranges>

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