



Lindsay Clapham BSc(Hons)
CVNDipAVN(Small Animal) RVN

Lindsay qualified in 2005 and joined Vale Referrals in 2013 as the senior referral nurse. She enjoys all aspects of referral nursing but has a particular interest in anaesthesia.

Surgical safety: Can a checklist really save lives?

Lindsay Clapham BSc(Hons) CVNDipAVN(Small Animal) RVN
Vale Referrals, The Animal Hospital, Stinchcombe, Dursley, Gloucestershire, GL116AJ. UK

ABSTRACT: Following the Safe Surgery Saves Lives campaign (WHO, 2008), surgical safety checklists (SSCs) were introduced into human operating theatres as a tool to reduce the risk of preventable complications during the perioperative period. The SSC has been largely successful in reducing such incidents in the human field. The use of veterinary SSCs is currently limited, although the benefits of SSCs are likely to be transferable to the veterinary practice. This article discusses the introduction of an SSC into practice and its potential use as a clinical auditing tool.

Keywords: Surgical checklist; Patient safety; Prevention; Preventable complications.

Introduction

It is well accepted that carrying out anaesthetic and surgical procedures in veterinary patients is not risk free. Surgical complications such as haemorrhage, retained swabs and post-operative infection have all been reported, although accurate figures for such incidents within the UK veterinary surgical context are unknown. Researchers have examined the incidence of retained surgical swabs and surgical site infections (Forster, Anderson, Yool, Wright & Burrow, 2011) (Mayhew, Freeman, Kwan & Brown, 2012).

Within the National Health Service (NHS) and private health hospitals, clinical auditing is commonplace and reports are frequently published detailing complications, preventable incidents and mortality rates during the perioperative period (NHS, 2015b).

The World Health Organisation (WHO) introduced the Safe Surgery Save Lives, campaign in 2008 (WHO, 2008). As part of this campaign, a surgical safety checklist (SSC) was devised for use in medical operating theatres to reduce the risk of preventable 'never events' (Haynes et al., 2009). Never events are defined as serious and preventable patient safety breaches that should not occur if preventative measures have been implemented (NHS, 2015a). The

use of the SSC resulted in improved communication and a reduction in the number of preventable incidents within the operating theatre (Haynes et al., 2009).

The introduction of the SSC has been largely successful and well researched in the medical field following its becoming a compulsory part of NHS practice in 2010. Treadwell, Lucas and Tsou (2013) noted an improvement in teamwork, communication of information and reduction of preventable events such as failure to administer antibiotics prior to surgical incision. Gordon and Reed (2012) noted some criticism of the tool, in that, without clear guidance and a champion of the SSC working in the operating theatre, it was viewed by some of the team as a box-ticking exercise and not utilised to its full potential. It has also been noted that incidents of retained surgical swabs have still been reported in human theatres, despite the use of an SSC, (Gasson and Wager, 2013).

Haynes et al. (2009) noted a 36% reduction in major complication rates, a 47% reduction in deaths and a 50% reduction in infection rates. These results were outstanding and there is no reason to doubt that similar outcomes could be achieved within the veterinary profession.

The Royal College of Veterinary Surgeons (RCVS) has highlighted the

importance of clinical governance and clinical auditing; this is included in the Practice Standards Scheme (PSS). Clinical governance is a process of reflection, analysis and improvement in practice (RCVS, 2012). It may take the form of morbidity and mortality rounds or auditing of data such as anaesthetic records. It is not currently compulsory for veterinary practices to record such data although some practices are doing so.

The use of SSCs for promoting patient safety, effective teamwork and data collection for clinical auditing within the veterinary environment is the focus of this article.

Minimising the risk of error

Human error is unavoidable, and stressful, fast-paced theatre environments can lead to mistakes and miscommunication of information. Emergency procedures carry greater risk of morbidity and mortality due to the unstable nature of the patient, but also due to the impact the extra stress and the need to work quickly has on the team.

The American Society of Anaesthesiologists (ASA) developed a scale that determines anaesthetic risk in individual patients (Posner, 2007); ASA III and higher is associated with a higher risk of morbidity and mortality in the perioperative period. This scale, however, does not take into account the nature of the surgical procedure, the skill of the surgeon or theatre support staff, all of which can affect risk in terms of time taken, response to critical events and breaks in sterility.

The use of the SSC before the start of each surgery reminds staff of the critical steps required prior to the first incision, such as antibiotics, skin preparation and that all surgical instruments are sterile and available. It may be said that people could feel they do not need to use an SSC as they never make mistakes, or that its use could increase anaesthetic time and become detrimental to the patient. However, stressful or unfamiliar situations could lead to the basic critical steps being forgotten because staff members are concentrating on new or unfamiliar tasks. Taking time to complete an SSC would ensure that these critical steps are not missed.

Gawande (2009) found that surgeons were concerned about the time taken to complete the SSC but, in fact, Haynes et al. (2009) found that completing the checklist actually saved time during critical events. Identification of potential problems and risks is likely to improve outcomes as they are communicated and prepared for in advance. We know from human and veterinary practice that adverse events can occur during complicated or routine surgery (NHS, 2009). We can all forget to give an antibiotic or premedication, not because we are bad at our jobs, but rather we are only human and sometimes things are forgotten or mistakes are made.

The checklist

The WHO developed a 19-point checklist that details all of the critical steps that need to be carried out prior to surgical incision and patient recovery. It is split into three sections: 'Sign in', 'Time out' and 'Sign out'. Each section is designed to be completed within two minutes to avoid it becoming a time constraint and to ensure full co-operation from theatre staff (WHO, 2008).

Adaptation of the checklist for veterinary practice is necessary due to the difference in operating procedures in both fields. For example in human surgery, a large theatre team, that does not work together very often, may come together for one procedure in a medical theatre. This differs greatly from veterinary practice, where the team is likely to be significantly smaller and individuals are known to each other.

Sign in

The first part of the checklist is the Sign in and should be completed before induction. The Sign in is completed before induction of the patient. So any issues that may prevent induction going ahead are discussed. It covers items such as the anaesthetic machine check, determining airway risk, ensuring the correct patient is present and estimating expected blood loss. The Association of Veterinary Anaesthetists (AVA) has developed a pre-induction anaesthesia safety checklist (AVA, 2014). Vale Referrals practice has adopted the AVA pre-induction checklist as our Sign in as it is a veterinary-specific tool. Either the WHO or the AVA Sign in could be used, although the WHO Sign in requires some adaptation to the veterinary setting.

Time out

This section is completed before the first incision and is usually initiated by the circulating nurse. It is called Time out to highlight that fact that everyone in the surgical team should stop for a moment to complete the SSC and focus on the patient. Each item is read out loud and verbally confirmed by the others in the room. The team briefly stops to complete the checklist, this section covers the critical steps required to prevent adverse events. The patient and surgery site are confirmed, the administration of antibiotics, if required, and correct preparation of the surgery site are also confirmed. Equipment sterility and availability is verified. The veterinary nurse (RVN) and veterinary surgeon (VS) will communicate their specific concerns regarding the procedure and anaesthetic, such as expected blood loss, fluid therapy plans and peri-operative analgesia. Finally the swabs are counted in (**Figure 1**).

Sign out

At the end of the procedure, all instruments, needles and swabs are accounted for, post-operative concerns and plans are communicated, and any adverse events are recorded (**Figure 2**).

Adaptation of the SSC for veterinary practice

The use of an SSC in medical operating theatres has demonstrated excellent results in reducing the number of avoidable adverse events (Haynes et al., 2009). In most cases the veterinary operating theatre presents a very different scenario. There is a diverse range of veterinary practices from small to large, multi-disciplinary, referral centres. At one end of the scale, there may be a one-VS-one-RVN team that works together every day and will demonstrate a good level of communication, although this may be tested during an adverse event, as they may not regularly encounter non-routine situations. At the other end, is a scenario of teams of 5–6 people working in a referral-theatre environment. This situation presents similar communication challenges to the human surgical environment.

The research conducted by Haynes et al. (2009) was carried out in both developing countries where resources such as staff and equipment were limited, and in developed countries that had access to all the equipment required. The results

Surgical checklist Time out

Confirm patient name and procedure Temp at GA start:

Estimated preparation time:

Has the patient received IV antibiotics? Estimated surgery time:

Has the surgical site been prepped?

Can the vet list any possible complications/unexpected steps that the team may need to know about?.....

.....

Can the anaesthetist highlight any potential complications that the team may need to know about?

.....

.....

ASA grade I II III IV V (please circle)

Have the swabs been counted in?

Does the surgeon/anaesthetist have all the required equipment?

Is all essential equipment working correctly?

Figure 1. Vale Referrals SSC Time out form

following the introduction of the SSC were similar in that all experienced a reduction in adverse events. This demonstrated that the checklist could work in different situations and there is no reason to assume this cannot be true of the veterinary industry.

Human error is not predictable and many factors affect our ability to perform at our best. For example emergency surgery late at night may have to be carried out by the same staff that have

worked all day, or by a newly qualified VS assisted by RVNs with limited surgical or emergency theatre experience. The use of the SSC would ensure that critical steps were not missed and potential problems were prepared for. It would be important to back up the SSC with a set of protocols for adverse events. Vale Referrals has regurgitation, hypovolaemia, perioperative analgesia and CPR protocols in place for use during adverse events. This means that staff members can prepare adequately in

advance and will also have a protocol to refer to should they need it.

Researchers have reported improved communication and teamwork following the introduction of the SSC (Haynes et al., 2009). Research has shown the SSC is responsible for a reduction of missing key steps, such as administration of antibiotic therapy, by providing a checklist of items. It is also thought that the reduction in critical events seen is linked to the improved teamwork that

<p>Sign out</p> <p>Have the swabs been counted out? <input type="checkbox"/></p> <p>Any packs/purse-strings to be removed? <input type="checkbox"/></p> <p>Any equipment problems to report? <input type="checkbox"/></p> <p>.....</p> <p>.....</p> <p>Any surgical/anaesthetic complications to report? <input type="checkbox"/></p> <p>.....</p>	<p>Preparation time:</p> <p>Surgery time:</p> <p>GA time:</p> <p>Temp at end of GA:</p>
---	---

Item	IN	OUT
NEEDLES		
BLADES		
SMALL SWAB		
LARGE SWAB		

Estimated blood loss (if applicable):

Figure 2. Vale Referrals SSC Sign out form

occurs due to the team completing the SSC together as opposed to the SSC itself. (Gawande, 2009). The discussion of anticipated critical events is a key opportunity for concerns about the patient to be raised and blood loss anticipated. This allows the team to prepare for and be more alert to the possibility of their occurrence.

Gasson & Wager (2013) introduced an SSC into a veterinary referral practice in 2008 and reported a positive outcome. There is currently little veterinary evidence of reduction in adverse events, complication rates and improvement in teamwork following the introduction of a checklist, but this research is likely to follow in the future.

The SSC may also be a source of data that can be utilised for clinical audits within the veterinary practice. I currently collect data on surgical-site infections, anaesthetic and surgical complications and surgery times, in order to assess the effectiveness of practice protocols.

Conclusion

SSCs are useful tools for reducing human error and adverse events during surgical procedures. They also improve teamwork and communication in medical theatres and have the potential to do so in veterinary theatres. Their use in the veterinary setting is currently under-utilised but following the

introduction of the AVA checklist it is likely that using checklists will become more commonplace. Research into the effectiveness of these tools in the veterinary environment is the next step, along with education of the profession about the potential benefits.

References

Association of Veterinary Anaesthetists (AVA). (2014). Anaesthesia safety checklist. Retrieved from www.ava.eu.com (Accessed: 10th January 2015).

Forster, K., Anderson, D., Yool, D.A., Wright, C. and Burrow, R. (2011). Retained surgical swabs in 13 dogs. *Veterinary Record*, 169, 337–43.

Gasson, J. and Wager, C. (2013). Improving patient safety in the perioperative period: surgical safety checklists. *The Veterinary Nurse*, 4, 322–327.

Gawande, A. (2009). *The Checklist Manifesto*. London: Profile Books.

Gordon, P. C. and Reed, A. R. (2012). The anaesthetist and the World Health Organisation surgical safety checklist. *South African Journal of Anaesthesia and Analgesia*, 18, 6–7.

Haynes, A.B., Weiser, T.G., Berry, W.R., Lipsitz, S.R., Breizat, A.S., Dellinger, E. P., Herbosa, T., Joseph, S., Kibatala, P.L., Carmela, M., Lapitan, M., Merry, A. F., Moorthy, K., Reznick, R.K., Taylor, B. and Gawande, A. (2009). A surgical safety checklist to reduce morbidity and mortality in a global population. *New England Journal of Medicine*, 360, 491–499.

Mayhew, P., Freeman, L., Kwan, T. and Brown, D.C. (2012). Comparison of surgical site infection rates in clean and clean-contaminated wounds in dogs and cats after minimally

invasive versus open surgery: 179 cases (2007–2008). *Journal of the American Veterinary Medical Association*, 240, (2), 193–198.

National Health Service. (2015a). Never events. Retrieved from www.england.nhs.uk/ourwork/patientsafety <http://www.england.nhs.uk/ourwork/patientsafety/never-events/ne-data/> (Accessed: 10th January 2015).

National Health Service. (2015b). Consultant outcome data. Retrieved from www.nhs.uk/consultantdata (Accessed 11th January 2015).

National Health Service. (2009). Patient Safety First Campaign. Retrieved from www.patientsafetyfirst.nhs.uk (Accessed: 10th January 2015).

Posner, L.P. (2007). Pre-anaesthetic assessment. In C. Seymour and T. Duke-Novaskovski (Eds.), *BSAVA Manual of Canine and Feline Anaesthesia and Analgesia* (2nd Ed.). Gloucester: BSAVA.

Royal College of Veterinary Surgeons. (2012). Clinical Governance Retrieved from www.rcvs.org.uk. (Accessed on 15th December 2014).

Treadwell, J. R., Lucas, S. and Tsou, A. Y. (2013). Surgical checklists: A systematic review of impacts and implementation. *BMJ Quality and Safety*, 23, 299–318.

World Health Organisation. (2008). Safe surgery saves lives Retrieved from www.who.int/patientsafety/safesurgery. (Accessed on 30th January 2015).

Multiple Choice Questions

1. What is a Surgical Safety Checklist (SSC)?

- (a) A tool to reduce the risk of preventable complications during the perioperative period
- (b) A list of equipment that will be required during the surgery
- (c) A tool to ensure that all staff in the practice are prepared for an emergency situation
- (d) A document listing all the roles of staff members in the operating theatre

2. In human centred operating theatres, data tells us that the use of SSC has :

- (a) Made operating times and waiting lists shorter
- (b) Helped staff members get to know each other better
- (c) Improved communication and reduced preventable incidents in theatre
- (d) Reduced waste in the operating theatre

3. The three parts of a SSC are:

- (a) Sign on, Time on, and Sign Out
- (b) Log in, Time on, Exit
- (c) Sign in, Time out, and Sign out.
- (d) Log in, Time out, and Sign out.

4. During which part of the SSC do the team confirm the patient identification?

- (a) Time out
- (b) Sign in
- (c) Sign out
- (d) Log in

5. During which part of the SSC do the team discuss the equipment that is needed during the surgery?

- (a) Time out
- (b) Sign in
- (c) Sign Out
- (d) Log in

6. At which part of the SSC do the team discuss their concerns and any potential critical events?

- (a) Time out
- (b) Sign in
- (c) Sign out
- (d) Log in

7. Why is it useful to discuss potentially critical events before surgery starts?

- (a) It allows staff to inform owners of patients about their concerns
- (b) It allows staff to prepare for and be more alert to the possibility of such events
- (c) It allows staff to prepare the rota and ask extra staff to stay late
- (d) It allows staff to plan how the theatre will be cleaned after the operation

8. Which of the following is an example of a potentially critical event that might be discussed during the SSC?

- (a) The diet that the patient will need after the surgery
- (b) Acute blood loss and the planned action required if it occurs
- (c) The time that the owners will likely be able to collect their animal
- (d) The use of suture material during the surgery

9. What is clinical governance?

- (a) Working according to the Code of Conduct
- (b) Ensuring that you keep your CPD hours up to date
- (c) Working using the latest textbook and online information
- (d) A process of reflection, analysis and improvement of practice

10. Clinical audits and Morbidity and Mortality (M+M) rounds are both examples of:

- (a) Collected data and opinion that may facilitate clinical governance
- (b) Useful CPD hours
- (c) Ways to try and use electronic records better
- (d) Activities that all practices must do weekly

For the answers to the MCQs, please go to: <http://www.bvna.org.uk/publications/veterinary-nursing-journal>