



— ASSOCIATION OF —  
VETERINARY ANAESTHETISTS

Celebrating 50 years of championing safe anaesthesia

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The Association of Veterinary Anaesthetists'  
**ANAESTHETIC SAFETY CHECKLIST  
IMPLEMENTATION MANUAL**

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First Edition, 2014

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The checklist and implementation manual were written by the AVA  
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## Introduction

***Maintaining patient safety and comfort should be viewed as the primary function of any anaesthetic.***

The Association of Veterinary Anaesthetists (AVA) has a fifty year history of promoting safe anaesthesia in veterinary medicine. In 2013 at the spring meeting of the AVA in London, a proposal was made to further this by developing a number of initiatives to improve anaesthetic safety at all levels of veterinary medicine. The primary task was to produce safety checklists and guideline documentation for key points within the anaesthetic process.

Anaesthesia can often be viewed as a means to end; a state enabling surgery, invasive medical and/or diagnostic procedures to be undertaken. Unfortunately this outlook often fails to recognise the importance of maintaining the safety and comfort of our patients during these procedures. Is it “good enough” to have an “alive and awake patient” at the end of anaesthesia? The AVA strongly believes that we should challenge this view and strive to ensure that each patient’s anaesthetic is managed safely (by recognising and minimising risks and appropriately managing complications) and that significant measures are taken to ensure patient comfort.

Maintaining safety and comfort are simple enough sentiments but anaesthesia is a complex process involving many critical steps that need to be performed in a correct and timely manner. Within a busy veterinary clinic there can be a tendency to try and over-simplify this complexity which can lead to steps being missed and vital components of a “safe” anaesthetic process being overlooked. Each of us has the responsibility to do as much as possible to ensure that our patients are kept both safe and comfortable and therefore the AVA has developed a number of recommended procedures and checklists to act as cognitive aids during the peri-anaesthetic period to assist in achieving this goal.

## Objectives

The objectives of these recommended procedures and checklists are threefold:

1. To outline an appropriate manner and order in which to perform key procedures in the anaesthetic process
2. To reinforce recognised safe practices by ensuring critical safety steps are performed before moving between key points in the anaesthetic process
3. To improve teamwork and communication during the anaesthetic process

***Adhering to these checklists will not guarantee safety. However they can be successful if the culture of your practice is such that the patient is central to all of the systems and processes in place.***

## The Checklists: Background

***“....it is not the act of ticking off a checklist that reduces complications, but performance of the actions it calls for”  
- Lucian Leape, 2014***

A set of checklists has been devised that can be followed in almost all situations where anaesthesia is being performed. The checklists are not designed to be a comprehensive list of all steps in the anaesthetic process but rather a framework and set of tools to help ensure that critical safety actions are performed. Each of the checks and steps have been included to reduce the risk of significant avoidable harm that can occur during the anaesthetic process. Only those considered inexpensive both in terms of time and finances have been included to ensure they are achievable for all levels of veterinary practice. Running through the safety checklists we have developed at the relevant times should ensure that none of the critical safety steps are missed.

All members of the veterinary team are responsible for the safety of the patient during an anaesthetic, not just the veterinarian in overall charge of the case. In order to best ensure safety each team member must be made aware of the critical safety points of the anaesthetic process and any safety concerns regarding the patient and or procedure. Consequently the checklists have been designed to facilitate the communication of essential safety information between members of the veterinary team involved in the patient's anaesthesia and the surgical/medical/diagnostic procedure.

It is not the checklists themselves that are important; instead it is the efficient and effective performance of the safety actions and communication outlined within them that are key to improving safety. We therefore recognise that modifications may be required in individual practices to allow them to be implemented effectively alongside other standard operating procedures and protocols. It may be that the checklists will be more effectively implemented in some institutions by applying them at different time points, or by adding or removing certain items – and we would encourage practitioners to tailor the checklist to their own institutions.

No checklist can be universal and implementation cannot guarantee safety. These checklists can only be effective when used within a patient-centred approach to the anaesthetic process where safety and comfort are the priority.

## The Checklists: How to use them

In a small team of two or three people the checklists can be implemented as a team with no single person in charge of its completion, however in larger teams it is recommended that a single person be made responsible for running the checklists. Ideally it should be a member of the veterinary team that will be present throughout the procedure such as the veterinary nurse or technician assigned to monitor the case.

For the purposes of the checklists the anaesthetic process has been divided into three phases. The checklists have been designed to fit between these phases, slotting into natural breaks in work-flow to avoid major delays. The time points are:

1. immediately prior to induction of anaesthesia
2. immediately prior to the procedure beginning (e.g. before the first surgical incision is made)
3. immediately prior to recovering the patient

At each time point it should be confirmed that every check has been performed and that critical safety and relevant patient information has been communicated between team members. Not until all check points have been completed should the team move onto the next phase of the anaesthetic process.

These checks can be easily integrated into normal practice work patterns without causing major disruptions. The checks should be confirmed and communicated verbally to ensure each team member is made aware of them.

## The Pre-Induction Checklist

To reduce the potential for any error occurring, it is important not to rush into the induction of anaesthesia. So, prior to the administration of any anaesthetic drugs, it should be ensured that the following critical safety steps have been performed.

Patient **NAME**, owner **CONSENT & PROCEDURE** confirmed

It is vital to ensure that the team is aware of “who” the patient is, what procedure is planned for the patient and that appropriate informed owner consent for the anaesthesia and procedure has been obtained. The consequences of mistakes such as anaesthetising the wrong patient, performing an incorrect procedure or anaesthetising a patient without proper informed consent can be disastrous and every attempt should be made so these events never occur.

**IV CANNULA** placed & patent

It is the recommendation of the AVA that an intravenous cannula is placed for anaesthesia in all patients where this is practicable. This facilitates drugs being given to effect, allows additional intravenous drugs and fluid therapy to be administered appropriately throughout the anaesthetic period and ensures immediate venous access should an emergency occur. The placement of this cannula should be confirmed by flushing with saline or heparinised saline prior to the injection of any drugs.

**AIRWAY EQUIPMENT** available & functioning

A patent airway is a critical component of a safe anaesthetic. Although endotracheal intubation may not be necessary in all cases, the ability to place an endotracheal tube or other suitable airway device is vital. A selection of tube types and sizes should be available for all patients where intubation is possible. The patency of tubes and airway devices should be checked by visually inspecting the tube lumen.

Other airway equipment, if available, should be checked ensuring that it functions appropriately. In small animals useful airway equipment can include: local anaesthetic sprays, suitably sized syringes to inflate endotracheal tube cuffs, laryngoscopes, suction devices, and potentially malleable guide-wires or similar devices such as stiff dog urinary catheters (which can be used to insufflate oxygen into the trachea and as “guide-wires” to place endotracheal tubes over in difficult airways). In large animals useful airway equipment can include: mouth gags, a 50mL syringe to inflate endotracheal tube cuffs, a flexible endoscope and non-irritant water based lubricant.

### Endotracheal tube **CUFFS** checked

Where endotracheal tubes have inflatable cuffs, these should be checked by inflating them and ensuring that they do not deflate spontaneously. After checking, the cuffs should be deflated. This ensures that the cuff can be inflated in order to protect the airway and facilitate intermittent positive pressure ventilation if it is required.

### **ANAESTHETIC MACHINE** checked today

For the purpose of this document and the checklist the “anaesthetic machine” is considered to be any device used to administer oxygen and/or anaesthetic gases to the patient. This could range from a system as simple as an oxygen cylinder with a flowmeter to a full anaesthetic workstation with integrated mechanical ventilator. It is essential to ensure that the machine is able to fulfill all of its functions effectively.

A full anaesthetic machine check should be performed at the start of each day or session. A more streamlined curtailed check should then be performed prior to each anaesthetic. See the AVA’s “Recommended procedure for checking anaesthetic machines and equipment”.

### Adequate **OXYGEN** for proposed procedure

Although it may not be necessary to perform a full anaesthetic machine check before every anaesthetic it is important to ensure that there is enough oxygen available to administer the planned flow for the likely or potential duration of the proposed procedure.



**BREATHING SYSTEM** connected, leak free & **APL VALVE OPEN**

Ensure that there is a method to administer the oxygen to the patient and the ability to perform manual intermittent positive pressure ventilation. This can be performed via an anaesthetic breathing system with a reservoir bag or self-inflating bag (such as an AMBU-Bag) in small animals and a large animal anaesthetic machine or demand valve in larger patients. The function of these systems should be confirmed via a visual and manual check and through ensuring they are leak free. Methods to leak test different anaesthetic breathing systems are described in the AVA's "Recommended procedure for checking anaesthetic machines and equipment".

A common error in anaesthesia at all levels is connecting a patient to a breathing system when the adjustable pressure limiting (APL or pop-off) valve has been left closed, this is especially common during periods where many actions have to be performed in succession such as induction. This can rapidly be fatal even with modern paediatric safety valves.

Person assigned to **MONITOR** patient

Things can go wrong even in what are considered to be 'routine' or 'simple' anaesthetics. It is fundamental that a suitably trained person is assigned to monitor the patient's physiological parameters and depth of anaesthesia during anaesthesia. Nothing can replace properly trained personnel in anaesthesia monitoring and the use of multi-parameter patient monitors should be considered an aid and not a replacement for a person.

It is imperative to ensure that all personnel monitoring and involved in anaesthesia understand the monitoring that is to be used, including any electronic monitoring available, and are able to interpret the outputs produced accordingly.

**RISKS** identified & **COMMUNICATED**

Every anaesthetic, even the most straightforward, carries some risk and there are a number of adverse events such as hypotension, hypoventilation, hypothermia and hypoxaemia that are commonly encountered. However, there are a multitude of specific species, breed, disease

and procedural risks that should also be identified and planned for prior to anaesthesia. A properly performed pre-anaesthetic assessment and plan (as outlined in the recommended procedure for pre-anaesthetic case assessment) will highlight potential complications and outline interventions that should be undertaken. It is paramount that the patient specific risks and proposed interventions are communicated to the entire veterinary team involved with the anaesthetic to facilitate early identification and allow prompt and appropriate action in a crisis.

### **EMERGENCY INTERVENTIONS** available

Despite meticulous planning and implementation potentially fatal crises can occur during any anaesthetic. Being able to perform basic cardiopulmonary resuscitation, gain an emergency airway, administer intermittent positive pressure ventilation and administer fluid therapy and drugs should be considered a basic requirement for all situations.

The list of equipment below should be available when performing anaesthesia in order to allow these fundamental procedures to be performed.

## EMERGENCY EQUIPMENT AND DRUGS LIST

(MINIMUM RECOMMENDED REQUIREMENTS)

*Endotracheal tubes (cuffs checked)*

*Airway aids (e.g. laryngoscope, urinary catheter, lidocaine spray, suction, guide-wire/stylet)*

*Self-inflating bag/anaesthetic breathing system suitable for IPPV  
(or demand valve for equine anaesthetics)*

*Epinephrine/adrenaline*

*Atropine*

*Antagonists (e.g. atipamezole, naloxone/butorphanol)*

*Intravenous cannulae*

*Isotonic crystalloid solution*

*Fluid administration set*

*Drug charts and CPR algorithm (<http://www.acvecc-recover.org/>)*

At this point the **PRE-INDUCTION CHECKLIST** is completed.

## The Pre-procedure Checklist

Before the procedure begins it is recommended that the entire team take a short “time out” in order to perform the Pre-Procedure Checklist. This ensures that each part of the process is in place and that each team member is ready and aware of the current situation.

### Patient **NAME & PROCEDURE** confirmed

At this point the name and specific procedure the patient is undergoing should be confirmed again. While it may seem repetitive, ensuring all team members are aware of the basics of the case is essential for ensuring that they are prepared for what is to follow and that the correct procedure is performed on the correct patient.

### **DEPTH** of anaesthesia appropriate

Prior to commencing the procedure it is imperative to ensure that the patient’s depth of anaesthesia is appropriate. Problems in anaesthesia often occur around times where there is a sudden change in stimulation level as seen when going from the preparation phase (i.e. clipping and aseptic preparation) to making the first incision.

### **SAFETY CONCERNS COMMUNICATED**

At this point any patient concerns that members of the team have should be communicated. Effective communication between members of the veterinary team is a critical component of maintaining safety during the peri-anaesthetic period. This builds from the **RISKS identified & COMMUNICATED** check and opens a forum for members of the team to highlight any current concerns that they have about the patient, anaesthetic or procedure. This also presents an opportunity for these problems to be addressed and to ensure that an intervention plan is in place and prepared for.

At this point the **PRE-PROCEDURE TIME OUT CHECKLIST** is completed.

## The Recovery Checklist

We only have a limited understanding of how many complications occur during recovery; however we do know that the proportion of anaesthetic related deaths occurring during this period is high, especially within the first 2-3 hours following extubation (Brodbeck et al, 2008). From this, it would appear that this is an area of patient management that often fails in veterinary anaesthesia. It is therefore vital that all requirements for the patient's post-anaesthetic care are carefully considered and properly communicated at this stage. Staff handovers at this point in the process are common as different nurses / technicians and or veterinary surgeons are often responsible for the recovery or ward areas as compared to the anaesthetic and procedure. Each team member should be made aware of the patient's condition and specific needs.

### **SAFETY CONCERNS COMMUNICATED**

Airway, Breathing, Circulation (fluid balance), Body Temperature, Pain

Clear and concise communication of the patient's current condition is paramount. This should include: the procedure performed, any complications which occurred under anaesthesia, current parameters including body temperature and any other key concerns regarding potential complications for the recovery period (e.g. a compromised airway, breakthrough pain, haemorrhage etc).

### **ASSESSMENT & INTERVENTION PLAN** confirmed

The monitoring and care plan for each patient will differ on an individual basis and an outline of this plan should be communicated to those managing the recovery period. Clear guidelines should be given as to what needs to be provided for the patient, which parameters should be monitored and recorded and how often these should be done. Interventions should also be set out so that all staff involved in the case are aware of what should be done if complications arise. This can be as simple as knowing who to approach if a problem is encountered and at what point they should be notified.

### **ANALGESIC PLAN** confirmed

The provision of analgesia (drug, dose, time and route of administration) will have been recorded on the anaesthetic monitoring chart but should also be clearly communicated to the person or team responsible for recovery. Pain assessment plans (such as pain scoring methods) should be outlined to help prevent too much or too little analgesia being provided to the patient. When assessment is next due should be highlighted and a clear plan to manage breakthrough pain should be discussed and recorded.

### Person assigned to **MONITOR** patient

It is imperative that there is an individual assigned to monitor the patient during the recovery period. Again this person should have suitable training and experience as the success of the above planning and communication is completely dependent on the person assigned to monitor and care for the patient.

At this point the **RECOVERY CHECKLIST** is completed.

### REFERENCES

Brodbelt, D.C., Blissitt, K.J., Hammond, R.A., Neath, P.J., Young, L.E., Pfeiffer, D.U., and Wood, J.N.L. (2008). The risk of death: the Confidential Enquiry into Perioperative Small Animal Fatalities. *Veterinary Anaesthesia and Analgesia*, 35, 365-373.

