



SOP for Anesthesia of Pets

Document Number	Effective Date	Review Date	Version No
NVH-P-U2-01	01/01/2019	31/12/2021	001

Document Approval

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Revision History

Revision	Revision Date	Reason for Revision	Revised by

Prepared by NVH	Reviewed by Review Committee	Authorized by DoL
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1. Purpose

1.1 This SOP describes the methods for anesthetizing dogs and cats.

2. Scope

2.1 This SOP covers the procedures for induction, intubation, extubation and monitoring of patient during anesthesia.

3. Responsibilities

Sl. No.	Official Designation	Responsibilities
1.	Veterinarian	Prescribe the anesthetic drugs as per the animal's body weight. Oversee the anesthetic procedure. Administer anesthetic drugs to the animal.
2.	Paraveterinarian	Administer anesthetic drugs. Monitor the animal during anesthesia.
3.	Animal attendant	Restrain the animal.

4. Definitions

4.1 **AHD:** It refers to Animal Health Division under the Department of Livestock.


4.2 **Animal attendant:** It refers to a person who helps in restraining of animals and ensures the well being of the animals during the treatment procedures.

4.3 **Anesthesia:** It refers to insensitivity to pain, especially as artificially induced by the administration of gases or the injection of drugs before surgical operation.

4.4 **Capillary refill time (CRT):** It reflects perfusion of peripheral tissues. Press on an area of mucous membrane. The gums will "blanch" white as they are pressed and become pink again when pressure is released. Normal: < 2 seconds.

4.5 **Consent form:** A form signed by the pet owner prior to an anesthetic/ surgical procedure to confirm that he or she agrees to the procedure and is aware of any risks that might be involved. The primary purpose of signing of consent form is to provide evidence that the pet

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owner gave consent to the procedure in question.

4.6 **DRA:** It refers to Drug Regulatory Authority.

4.7 **DVH:** It refers to Dzongkhag Veterinary Hospital.

4.8 **Effective Date:** It is the date that a document becomes effective for use.

4.9 **Elizabethan collar (E-Collar):** It refers to a protective medical device worn by an animal, usually a cat or dog. Shaped like a truncated cone, its purpose is to prevent the animal from biting or licking at its body or scratching at its head or neck while wounds or injuries heal.

4.10 **Endotracheal tube:** It refers to a catheter that is inserted into the trachea for the primary purpose of establishing and maintaining a patent airway.

4.11 **Extubation:** It is the process of removal of endotracheal tube.

4.12 **Induction:** It is the process of initiating anesthesia to facilitate intubation.

4.13 **Intubation:** It is the process of placing a tube into the body for medical purposes. Typically, intubation refers to the placement of an endotracheal tube to assist the patient when they are not breathing effectively. The tube is placed into the trachea and connected to an assistive device for breathing.

4.14 **NVH:** It refers to National Veterinary Hospital, Thimphu.

4.15 **Para-veterinarian:** It refers to a person with diploma in Animal Science and is authorized to provide treatment to the animals.

4.16 **Pre-emptic analgesia:** is defined as a treatment that is initiated before surgery in order to prevent the establishment of central sensitization evoked by the incisional and inflammatory injuries occurring during surgery and in the early postoperative period.

4.17 **Procedure:** It refers to SOP.

4.18 **Review Committee:** It refers to a group of people from the department who will review the procedure to see if it should be improved, corrected, or changed.

4.19 **Restrain:** It refers to application of any procedure designed to restrict its movements in order to facilitate examination of patient.

4.20 **SOP:** It refers to Standard Operating Procedure.

4.21 **Stabilization:** It refers to the action of making the patient stable.

4.22 **Staff:** It refers to veterinarians, para-veterinarians and animal attendants.

4.23 **VHs:** It refers to veterinary hospitals in the country.

4.24 **Veterinarian:** It refers to a person holding a bachelors degree in Veterinary Science and Animal Husbandry and is authorized to practice veterinary medicine.

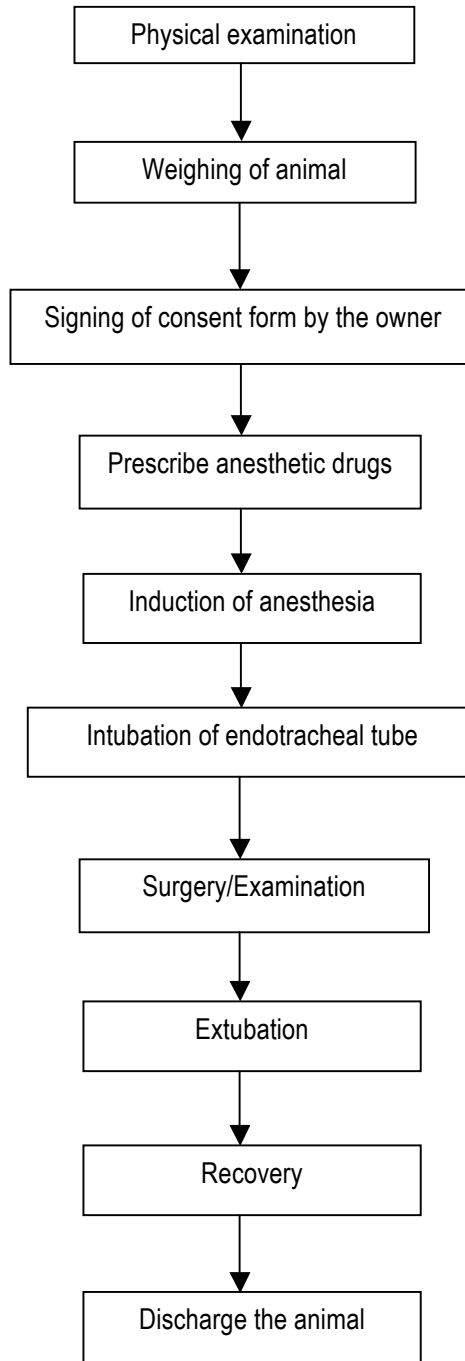
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5. Process Map in Flow Chart



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6. Procedure

- 6.1 All the technical staff involved in administering anesthesia in pets should wear clinical dress (blue) or white lab coat (properly buttoned) with nametag.
- 6.2 Perform a thorough physical exam and obtain an accurate body weight of the animal.
- 6.3 Inform about the risk associated with anesthesia and obtain consent from the owner. The consent form should be dully filled and signed by the owner.
- 6.4 Induction
 - 6.4.1 Induction/ Pre-anesthetic drugs used are Xylazine and Atropine sulphate.

Routes	Xylazine		Atropine sulphate	
	Intramuscular	Intravenous	Intramuscular	Subcutaneous
Dog	1mg-2mg/kg	0.5mg/kg	0.2mg/kg	0.2mg/kg
Cat	1mg/kg	0.5mg/kg	0.3mg/kg	0.3mg/kg

*** For dogs weighing more than and equal to 10kg, 1ml of Xylazine can be administered. The total volume of Xylazine shouldn't exceed 1ml in dogs.**

6.5 General Anesthesia

- 6.5.1 Ketamine and Diazepam are given 10min after pre-anesthetic medication.


Routes	Ketamine		Diazepam	
	Intramuscular	Intravenous	Intramuscular	Intravenous
Dog	10mg/kg	0.5mg/kg	2mg/kg	0.2mg/kg
Cat	11mg/kg	0.5mg/kg	2mg/kg	0.3mg/kg

*** Ketamine and Diazepam can be mixed in one syringe.**

6.6 Top - Up anaesthetic medicine.

- 6.6.1 1:2 ratios of Diazepam and Ketamine respectively is mixed in one syringe and given as per the requirement.
- 6.6.2 The top-up mix is administered preferably through intravenous route.

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****The anaesthetic drugs used during the surgery should be entered in the Anaesthetic Drug register.***

6.7 Other medications

- 6.7.1 Administer antibiotics before the surgery.
- 6.7.2 Pre-emptic analgesia with painkillers.

6.8 Placement of intravenous catheter/ Scalp vein.

- 6.8.1 Choose the site for intravenous injection.
 - 6.8.1.1 The sites for venipuncture are cephalic veins (front of front legs), lateral saphenous veins (outside lower rear legs), medial saphenous veins (inside upper rear legs) for cats and jugular veins.
- 6.8.2 Clip the hairs or shave the area.
- 6.8.3 Hold below elbow (cephalic vein) and above knee (saphenous vein).
- 6.8.4 Use thumb to roll cephalic vein outside.
- 6.8.5 Wipe the site with cotton dipped in spirit.
- 6.8.6 Use IV cannula size 24G (yellow) for cats & small pups, 22G (blue) for average sized dog and 20G (pink) for larger dogs.
- 6.8.7 Insert the tip of the needle into the vein and when blood begins to flow into the hub of the catheter, advance the catheter forward over the needle into the vein.
- 6.8.8 Remove the needle and connect the cannula to the IV fluid.
- 6.8.9 Apply plaster over the wing of the cannula around the limb of the animal to secure the cannula.

6.9 Intubation of Endotracheal tube

- 6.9.1 Select the appropriate endotracheal:
 - 6.9.1.1 For Endotracheal (ET) size refer annexure 1.
 - 6.9.1.2 Length of endotracheal tube is determined by holding the ET tube next to the patient, with the tip on the thoracic inlet. If the length of the ET tube exceeds the thoracic inlet, ET tube can be cut to suitable length.
- 6.9.2 Lubricate endotracheal tube.
- 6.9.3 With the animal on sternal recumbency, extend the neck and head so that they are in a straight line.
- 6.9.4 While holding the upper jaw, pull the tongue forward so that it lies between two lower canines. Pull the lower jaw downwards by pulling the tongues down until epiglottis is visible.
- 6.9.5 Use the laryngoscope to disengage the epiglottis from the soft palate, exposing the glottis and vocal chords.
- 6.9.6 Gently push the epiglottis down with the tip of the tube and insert gently past the vocal folds into the trachea (this can be timed with exhalation).
- 6.9.7 The tube must not be introduced too far or endotracheal intubation may occur. This results in ventilation of one lung only.

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- 6.9.8 Confirm proper of endotracheal tube in the trachea (rather than esophagus). This can be performed by holding a piece of fur or cotton near the end of the tube and observing its movement as the patient exhales. However, care should be taken to ensure the material used is not inhaled into the tube
 - 6.9.9 If the endotracheal tube is cuffed, inflate the cuff just enough to prevent gas escaping.
 - 6.9.10 Secure the endotracheal tube by tying a piece of gauze around the tube then behind the animal's head.
- *Over inflation of endotracheal cuff can damage the tracheal mucosa or cause occlusion of the tube. Under inflation enables the patient to breathe around the tube and foreign material may pass into the trachea.**
- 6.10 Intra venous fluid administration
 - 6.10.1 Isotonic fluids like 0.9% Normal saline or Ringers lactate is preferred.
 - 6.10.2 Before giving the fluids to the animal, the fluids should be warmed to the body temperature.
 - 6.10.3 If the animal is dehydrated or under trauma, the fluid loss needs to be corrected before the surgery
 - 6.10.4 The surgical fluid rate is 10ml/kg/hr in cats and dogs with normovolemia. (Loading rate cats: 3ml/kg/hr, dogs: 5ml/kg/hr).
 - 6.10.5 Calculate drops per minute.
 - 6.10.6 Total Volume of fluid (ml)/min * drops per ml.
 - 6.10.7 Monitor the response of the animal throughout the surgery.
 - 6.11 Surgery
 - 6.11.1 Refer SOP for major and minor surgery for pets.
 - 6.12 Extubation
 - 6.12.1 Release the tie holding the endotracheal tube in place
 - 6.12.2 Deflate the cuff.
 - 6.12.3 Withdraw the tubes as the animal exhales in a slight downward arc:
 - 6.12.3.1 In dogs the tube is left in place till the swallowing reflex or gag reflex returns.
 - 6.12.3.2 Cats should be extubated before the swallowing reflex. Signs of impending arousal include tail, limb, and head movement of active palpebral reflex. Delayed extubation may lead to laryngospasm.
 - 6.13 Post Operative Care.
 - 6.13.1 If clinical indications (Capillary Refill Time (CRT), respiratory rate, heart rate etc) are normal, the IV cannula/ scalp vein can be removed. Refer Annexure 2 for normal parameters.
 - 6.13.2 Check the bleeding from the venipuncture site with the help of dry cotton and mild pressure over the venipuncture site.

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- 6.13.3 Carefully place the animal on the floor.
- 6.13.4 Keep the animal under the observation and discharge the animal upon recovery only.
- 6.13.5 Advise the owner to check the animal from self-mutilating the surgical wound. If required advice for over the counter or self improvised E-Collar or body brace bandage or scrotal bandage.
- 6.13.6 Advise the owner to bring the animal for suture removal after 7-10 days or to bring the animal as soon as they observe discharge (Serous/ purulent/serosanguineous) from the surgical wound.
- 6.13.7 Advise the owner the importance of compliance with completion and dose rate of antibiotics.

7. Related Forms or Work Instructions

- 7.1 SOP for Surgery of Pets.
- 7.2 SOP for Customer care.

8. References

- 8.1 SOP on SOP format – Drug Regulatory Authority, Thimphu.
- 8.2 Pet Registration Booklet.
- 8.3 SOP no 116 – Dog Anesthesia, McGill.
- 8.4 Vets Beyond Border drug protocol.
- 8.5 Humane Society International surgery protocol.
- 8.6 Clinical procedures in veterinary nursing, Butterworth Heinemann.
- 8.7 Small Animal Anesthesia Techniques, Wiley Blackwell.

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