

Guidelines for Safety in Veterinary Anaesthesia

Minimal structural, technological, and organizing requirements for veterinary operating theatres.

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1. Functional relationships with other units

The surgical unit area, which can be represented by a single theatre, or more, possibly adjacent rooms, should grant a good connection with other areas such as wards, emergency, and imaging.

The structure of the surgical unit area should allow a free in/out flow of staff, patients and materials, with doors and corridors of suitable size, allowing the passage of equipped stretchers.

2. Specific environmental outfit

In the surgical unit area the following minimal requisites are envisaged.

Spaces should be organized in order to allow transit through areas with an increasing level of sterility, from entrance to operating theatre.

The following three main areas should be scheduled.

- a) Preparation area
- b) Operating theatre
- c) Recovery area

a) Preparation area (Prep area)

It should include an area for premedication, intravascular line placement, trichotomy, and cleaning of the patient; the same area could also be used for deep sedation, induction and maintenance of general anaesthesia, and the performing of peripheral or central regional anaesthesia/analgesia.

b) Operating theatre

Taking into account the existing veterinary practices, the minimal surface for an operating theatre should allow the surgical team and the anaesthetist to work freely, without being a handicap to one another.

For newly-created practices, a minimal area of 20 square metres should be provided.

In 24-hour emergency veterinary practices, an operating theatre available any time day and night is required.

For newly-created practices, it is also suggested that all rooms used for diagnostic/therapeutic procedures and for minor surgical procedures requiring deep sedation or general anaesthesia should be located by the surgical unit area, so allowing an easy use of the high-tech equipment available in the surgical unit if necessary.

These rooms may be smaller than the above mentioned operating theatres.

c) Recovery area

As far as immediate post-anaesthesia care is concerned, carrying it out in a fully-equipped area is desirable, adjacently to the operating theatre, and accordingly to ISVRA advice (see Enclosure1, Recommendations for Post-anaesthetic Care).

The following spaces should be added to the ones designed as above: a "filter" area at the entrance, a scrub-in area for the surgeon, a store for clean material (sterile objects, drugs, anaesthesiological and surgical tools and equipment).

3. Technological requirements

The following minimal requirements are envisaged:

General features

There must be an electric system complying with safety rules and supplied with a suitable number of sockets.

The centralized medical gas dispensing system - if present- should grant a working pressure of 4/5 atmospheres, with gauges inserted in the pipe circuit well on sight. This pressure should remain unaltered, with a 20 litres per minute fresh flow for each plug.

A powerful aspirator is necessary, or a plug connected to a central vacuum system (suction).

An efficient exhaust gas scavenging system is also necessary.

a) Preparation area

The area should have the following technological features.

A suitable number of electric sockets, oxygen line, suction and exhaust gas scavenging. Moreover, it should be equipped with an emergency trolley (containing emergency drugs and tools), and an aspirator (if a centralized vacuum system is not available). An ECG monitor, a pulseoxymeter, and a system for constant assessment of body temperature should be readily available.

b) Operating theatres

Electric system: a minimum of six sockets for each operating table is required.

Air conditioning: The system should keep the theatres at a temperature range between 20 and 25 C°, except different directions are given.

Ventilation: as for newly established veterinary practices, they should allow a minimum of six total changes per hour of the air contained in the rooms, for staff safety.

Medical gas supply system: At least one oxygen and one vacuum plugs per each table should be scheduled, or a powerful aspirator in absence of a centralized vacuum system.

The following devices and monitoring apparatuses are **essential** for each operating table:

1. an anaesthetic apparatus provided with:
 - high precision safety flow-meters;
 - vaporizers with safety-pin loading system of inhalational anaesthetics;
 - a breathing system allowing manual ventilation;
 - if a ventilator is available, it should have an airway pressure acoustic alarm system and an alarmed spirometer reading volumes from the expiratory limb of the breathing system;
 - an exhaust gas scavenging system, possibly using vacuum.
2. one oxygen cylinder for emergencies;
3. one body temperature measuring system;
4. one pulseoxymeter;
5. one trolley with anaesthesia drugs and equipment (laryngoscope, endotracheal tubes of all necessary internal diameters, respiratory bags, 'difficult airways' tools, intravenous catheters).

The following are devices and monitoring equipment which should be available on occurrence:

1. ECG monitor, handheld pulseoxymeter;
2. non-invasive arterial pressure monitor;
3. fluoroscopy and /or x-ray machine;
4. heating/cooling systems for the patient.

Monitoring systems during anaesthesia are described in the paper called 'Recommendations for minimal patient monitoring during anaesthesia' (see Enclosure 2).

As far as medical gas plugs are involved, the European Committee for Standardization prescriptions on the refreshing or new building of operating theatres should be kept in mind, even though these prescriptions are still on the making.

c) Recovery area

The recovery area should have an adequate number of electric, oxygen and vacuum sockets.

If the area has no windows, a minimum of six air changes per hour is necessary, to ensure staff safety.

Furthermore, all emergency drugs and tools (oxygen therapy systems, breathing systems, Ambu bag) should be readily available in the area.

ECG monitor, pulseoxymeter, body temperature sensors, and body heating systems should be available as needed. The number of these devices is related to the number of patients and to the kind of surgical illnesses the surgery deals with; in any case, the number should not be simply determined on a cage number basis.

4. Organization

Pre-anaesthetic evaluation

Pre-anaesthetic evaluation should be carried out by a veterinary surgeon who usually performs anaesthesia, with the aim of assessing the patient's conditions, pointing out the suitable pre-operative tests to be done and giving advice on preparation to surgery. This preparation will have to consider the envisaged type of surgical procedure, advice from the surgeon and the requests suggested by the pet's owner (see Enclosure 3, 'Recommendations for Pre-anaesthetic evaluation preceding elective therapeutic and diagnostic procedures').

Operating theatre

- *Elective activities*

Anaesthesia must be carried out by a veterinary surgeon who has skills and knowledge to perform the procedure.

The anaesthetist's tasks include pre-anaesthetic evaluation of the patient, check of equipment, materials and drugs before induction, delivery of anaesthesia (deep sedation, general anaesthesia, regional anaesthesia); constant monitoring of recovery from anaesthesia, and post-anaesthesia care.

As far as more complex pathologies or surgical treatments are involved, more than one anaesthetist may be required to carry out the procedure.

The presence of a veterinary surgeon who regularly performs anaesthesia is also necessary for all the diagnostic and therapeutic activities which require deep sedation or general anaesthesia (endoscopy, MRI, CT, angiography, x-ray imaging in 'difficult' patients, biopsy, other diagnostic or therapeutic procedures).

Post-anaesthesia care

A veterinary surgeon who has skills and knowledge in anaesthesia should be in charge during recovery from anaesthesia. Surveillance and assistance over this period of time should be carried out by fully trained paramedic staff, under supervision of the veterinary surgeon in charge.

ISVRA Task Force on 'Guidelines for Safety in Veterinary Anaesthesia'

References

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