

Minimum Recommendations for Equipment and Supplies for

Veterinary Emergency and Critical Care Facilities

The Veterinary Emergency and Critical Care Society (VECCS) has endorsed a standardized guideline that specifies the minimum recommended equipment and supplies that any emergency and critical care veterinary hospital should have available for the treatment of patients. This guideline is meant to raise the standard of care and increase the public and professional awareness of the level of care that is expected from a hospital that defines itself as a treatment facility for the emergent and critical veterinary patient.

PART 1: OPERATIONS OVERVIEW FOR A VETERINARY EMERGENCY FACILITY

Staffing

A licensed DVM must be on premises during operating hours. A working relationship with a Diplomate of the American College of Veterinary Emergency and Critical Care and/or other veterinary specialists with a special interest and experience in emergency and critical care is recommended to optimize patient care and facilitate patient referral if necessary.

Sufficient staff must be available to provide expedient patient care and allow:

- Processing of multiple patients concurrently.
- Performance of a wide range of life-saving procedures to include, but not be limited to, cardiopulmonary resuscitation and emergency surgery. This requires at minimum 2 people, including 1 veterinarian and 1 veterinary technician or assistant.
- The ability to call-in additional staff as needed.
- Provision of timely and appropriate in-hospital patient care.
- Appropriate and timely consultation with veterinary specialists.

Medical Records

A complete and thorough medical record for each patient should be kept on file at the emergency and critical care facility. Because of the importance of legibility and availability of medical records, all summary medical records should be computer-generated, digitally stored, and backed up. Additionally, the emergency and critical care facility must comply with state administrative codes for informed consent, patient record keeping and the release of patient records.

The medical record must include but not be limited to:

- Client information
 - Name
 - Address
 - Phone number

- Referring Veterinarian/Clinic
- Patient identification
 - Name
 - Species
 - Breed
 - Age
 - Sex (including reproductive status)
 - Color

- Patient vaccination status
- Patient history
- Patient weight
- Vital signs
 - Temperature
 - Heart rate
 - Respiratory rate and effort
 - Mucous membrane color
 - Mental status
 - Level of pain

- Physical examination findings
- Clinical pathology tests performed and their results

- Diagnostic imaging performed and their interpretation
 - Tentative and/or differential diagnosis
 - Procedures performed (including anesthetic and surgical release forms and reports)
 - All drugs administered, prescribed, or dispensed
 - Name
 - Dose
 - Route of administration
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- Progress notes
 - Additional treatment and nursing notes
 - Client and referring veterinarian communications
 - Discharge instructions, including follow-up instructions
 - All entries in the medical record should clearly identify the individual(s) who administered care and entered data with time and date included.

Communications

Effective communications must be maintained to allow efficient transfer of patient information between the emergency and critical care facility and primary care veterinarians in a timely manner. It is highly recommended that the emergency and critical care facility maintain an updated list of contact telephone numbers of primary care referring veterinarians. The list should include whether the veterinarians are willing to be and where they can be contacted after-hours. A copy of the discharge instructions should be given to the client at the time of discharge and a faxed or electronic report should be sent to the pet owner and primary care veterinarian within 12 hours of a patient's discharge in order to ensure immediate continuity of care and for inclusion in the patient's permanent record.

Continuing Education

Continuing education (CE) must be provided for professional and technical staff and must allow:

- Veterinarians and veterinary technicians to comply with CE requirements for state licensure.
- Veterinary specialists to meet specialty board CE requirements to maintain certification.
- Veterinary technician specialists to meet CE requirements of their respective speciality

academy to maintain certification.

All emergency staff veterinarians should obtain a minimum of 28 hours of CE every 2 years in the field of emergency medicine, surgery, and/or critical care medicine.

All technical staff (veterinary technicians and assistants) should obtain a minimum of 10 hours of CE every 2 years in the field of emergency and critical care medicine.

A system of ongoing, in-service training should be provided for veterinarians and technical staff to assure teamwork and familiarity with current procedures and guidelines. The instructor's name, topic, number of hours, and attendance records should be documented.

Resources

The emergency and critical care facility must have appropriate and comprehensive references available to the staff at all times. Refer to Part 2 of this document for a list of the recommended references.

Internet access to online emergency and critical care resource information must be available.

Emergency Capabilities

The level of care and maintenance provided in areas of laboratory, pharmacy, medicine, surgery, anesthesiology, diagnostic imaging, infectious diseases control, and housekeeping should be consistent with currently accepted practice standards and comply with state, federal, and provincial directives. Instrumentation, pharmaceuticals, and supplies should be sufficient for the practice of medicine and surgery at a level of care consistent with that expected in the practice of veterinary medicine as directed by the individual country, state, or province practice acts.

All emergency and critical care facilities must have the capacity to:

1. Diagnose and manage life-threatening emergencies including cardiovascular, respiratory, metabolic, gastrointestinal, urogenital, neurologic, environmental, hematologic, hemorrhagic, toxicologic and coagulopathic problems.

2. Perform procedures to address life threatening problems including but not limited to:

- Cardiopulmonary resuscitation
- Placement and maintenance of thoracostomy tubes
- Emergency tracheostomy and tracheostomy tube care
- Blood product administration
- Oxygen supplementation
- Assisted ventilation

3. Perform emergency surgery including but not limited to:

- Surgical hemostasis, wound debridement, and application of wound dressings
- Stabilization of musculoskeletal injuries
- Aseptic thoracic and abdominal surgery

4. Treat circulatory shock using

- Crystalloid fluids
- Colloid fluids
- Blood products
- Vasoactive drugs

5. Allow accurate delivery of fluids using calibrated burettes and infusion pumps.

6. Administer natural and/or artificial blood products as well as type and cross match donor and recipient blood.

7. Administer analgesic therapy and anesthetic agents including but not limited to:

- Pure agonist opioids
- Non-steroidal anti-inflammatory medication
- Alpha-2 agonists
- Injectable and inhalation anesthetics
- Reversal agents for opiates and alpha-2 agonists
- Sedative medication

8. Provide intraoperative monitoring to include but not limited to:

- Body temperature
- Electrocardiography
- Blood pressure
- Capnography
- Pulse oximetry

9. Maintain an anesthetic log for all anesthetized patients documenting duration of anesthesia, monitoring parameters and medications administered.

10. Decontaminate and administer antidotes when indicated for toxin exposure.

11. Perform, in a timely manner, laboratory procedures listed in Part 3 of this document. Additionally the emergency and critical care facility must have laboratory supplies to collect, prepare and preserve samples for analysis at an offsite laboratory.

12. Perform diagnostic imaging to include but not limited to:

- Plain film radiography
- Ultrasonography with the minimum requirement that the staff veterinarians have proficiency in the detection life-threatening clinical problems to include but not limited to fluid in the thoracic, pericardial and peritoneal spaces.

PART 2: MINIMUM RECOMMENDED REFERENCE LIST FOR A VETERINARY EMERGENCY FACILITY

Textbooks

General Physiology - an edition of one of the following published within the previous 15 years

- Textbook of Medical Physiology, Boron and Boulpaep
- Review of Medical Physiology, Ganong
- Textbook of Medical Physiology, Guyton & Hall
- Berne & Levy Physiology, Koeppen & Stanton, et al.
- Textbook of Veterinary Physiology, Cunningham

Veterinary ECC – an edition of each of the following published within the previous 10 years

- Small Animal Critical Care Medicine, Silverstein & Hopper
- Manual of Trauma Management in the Dog and Cat, Drobatz, et al.

Veterinary ECC Technical Manuals – an edition of one of the following published within the previous 15 years

- Veterinary Emergency and Critical Care Manual, Mathews, 2nd ed.
- Veterinary Emergency and Critical Care Procedures, Hackett & Mazzaferro
- Manual of SA Emergency & Critical Care Medicine, Macintire, et al.

- Advanced Monitoring and Procedures for Small Animal Emergency and Critical Care, Burkitt-Creedon & Davis

Fluid Therapy/Acid-Base/Electrolyte - an edition of the following published within the previous 10 years

- Fluid, Electrolyte, and Acid-Base Disorders in Small Animal Practice, DiBartola

General Veterinary Internal Medicine – an edition of one of the following published within the previous 10 years

- Textbook of Veterinary Internal Medicine, Ettinger & Feldman
- Small Animal Internal Medicine, Nelson & Couto

Veterinary Surgery - an edition of one of the following published within the previous 15 years

- Small Animal Surgery, Fossum
- Textbook of Small Animal Surgery, Slatter
- Veterinary Surgery: Small Animal, Tobias & Johnston

Veterinary Anesthesia - an edition of one of the following published within the previous 15 years

- Veterinary Anesthesia & Analgesia, McKelvey & Hollingshead
- Lumb & Jones' Veterinary Anesthesia and Analgesia, Tranquilli, et al.

Veterinary Ophthalmology – an edition of one of the following published within the previous 15 years

- Essentials of Veterinary Ophthalmology, Gelatt
- Slatter's Fundamentals of Veterinary Ophthalmology, Maggs et al.

Veterinary Pharmacology – an edition of one of the following published within the previous 10 years

- Small Animal Clinical Pharmacology and Therapeutics, Boothe
- Small Animal Clinical Pharmacology, Maddison et al.

Veterinary Toxicology – an edition of one of the following published within the previous 15 years

- Veterinary Toxicology: Basic and Clinical Principles, Gupta
- Clinical Veterinary Toxicology, Plumlee
- Small Animal Toxicology, Peterson & Talcott

Veterinary Clinical Pathology – an edition of one of the following published within the previous 15 years

- Fundamentals of Veterinary Clinical Pathology, Stockham & Scott
- Duncan & Prasse's Veterinary Laboratory Medicine: Clinical Pathology, Latimer et al.
- Small Animal Clinical Diagnosis by Laboratory Methods, Willard & Tvedten
- Veterinary Hematology and Clinical Chemistry, Thrall

Veterinary Pediatrics – an edition of one of the following published within the previous 15 years

- Veterinary Pediatrics, Hoskins
- Small Animal Pediatrics, Peterson & Kutzler

Specific topic areas of Veterinary Medicine published within the previous 15 years

- Canine and Feline Endocrinology and Reproduction, Feldman & Nelson
- Infectious Diseases of the Dog and Cat, Greene
- Ferrets, Rabbits and Rodents, Quesenberry & Carpenter (**Level I**)
- Reptile Medicine and Surgery, Mader (**Level I**)
- Exotic Animal Formulary, Carpenter (**Level I**)

Veterinary Neurology – an edition of one of the following published within the previous 15 years

- Fundamentals of Veterinary Clinical Neurology, Bagley
- Handbook of Veterinary Neurology, Lorenz & Kornegay
- BSAVA Manual of Canine and Feline Neurology, Platt and Olby
- Veterinary Neuroanatomy and Clinical Neurology, de Lahunta and Glass
- Small Animal Neurology, Andre Jaggy

Veterinary Oncology – an edition published within the previous 15 years

- Small Animal Clinical Oncology, Withrow & MacEwen

Veterinary Cardiology – an edition of one of the following published within the previous 15 years

- Textbook of Canine and Feline Cardiology, Fox, et al.
- Small Animal Cardiovascular Medicine, Kittleson & Keinle
- Cardiovascular Disease in Small Animal Medicine, Ware

Veterinary Avian Medicine and Surgery – an edition of one of the following published within the previous 15 years

- Avian Medicine and Surgery, Altman (**Level I**)

- Avian Medicine and Surgery in Practice, Doneley (**Level I**)
- Essentials in Avian Medicine and Surgery, Coles (**Level I**)

Journals

- Journal of Veterinary Emergency and Critical Care
- Journal of the American Veterinary Medical Association

PART 3: MINIMUM RECOMMENDATIONS FOR A VETERINARY EMERGENCY FACILITY

Facilities

ER receiving/triage area

ICU area

Dedicated isolation area with documented infection control plan

Dedicated surgical room

Radiology room that complies with federal and state radiation safety regulations

Oxygen (ER receiving/ICU/ISO/SX/Radiology)

Anesthetic scavenging (ICU/SX/Radiology)

Suction (ER receiving/ICU/SX)

Equipment sterilization capability and quality control

Emergency preparedness plan or onsite backup power supply in case of power outage

In-Patient Support

Anesthesia

Warming support (FA, CWB, or HD)

Logs/Records

Small animal blood products

Blood typing capability (canine and feline)

Fresh frozen plasma

Canine

Feline

Packed red blood cells

Canine

Feline type A

Feline type B (or readily available donor)

And/or a readily available screened canine and feline donors (onsite or local blood bank with 24 hour service)

Red blood cell substitute (if available)

Fluid therapy

Crystalloids

Replacement

Isotonic buffered

0.9% Saline

Carrier (D5W)

Synthetic colloids

Fluid pumps

Syringe pumps

Calibrated burettes

Intravenous catheter types

Peripheral

Nutritional

Naso-esophageal or naso-gastric tube feeding

Pharmacy

Activated charcoal

Analgesia

Injectable agonist opioids

Nonsteroidal anti-inflammatory agents

Alpha-2 agonist

Local anesthetics

NMDA receptor antagonists

Oral analgesic agents

Antibiotics

Injectable (Minimum: beta lactam, fluoroquinolone, aminoglycoside, metronidazole)

Oral

Antihistamine (injectable)

Anti-seizure medications

Injectable

Oral

Corticosteroid

Injectable

Oral

Dextrose (injectable)

Drugs for CPR

Epinephrine

Vasopressin

Atropine

Glycopyrrolate

Electrolyte additives

Calcium gluconate

Potassium chloride

Insulin- Regular

Lipid solution (20%)

Sedative medications

Injectable

Oral

Vasoactive/Antiarrhythmic drugs

Dopamine

Dobutamine

Lidocaine

Propranolol or Esmolol

Respiratory support

Oxygenation (nasal/cage)

Ventilation

Ambu bag/ anesthetic machine

Anesthetic ventilator

Monitoring

Blood pressure

Indirect

Body temperature

Capnometry/ capnography

Electrocardiography

Pulse oximetry

Tonometry

Urinary catheter and closed collection system

Diagnostics

Radiography

300 Ma radiography machine (standard or digital)

Automatic processor (with standard radiography)

Ultrasonography

Laboratory equipment and testing in house

Packed cell volume

Refractometric total solids

CBC with manual differential reading

Glucose

Lactate

Dry chemistry analyzer

Electrolytes

Blood gas

Coagulation

PT

APTT

FIV/FELV antigen testing

Cytology

Urinalysis

Fecal flotation

Parvoviral antigen testing

Abbreviations:

APTT activated partial thromboplastin time

CBC complete blood count

CWB circulating warm water blanket

CPR cardiopulmonary cerebral resuscitation

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|------|-------------------------------|
| D5W | 5% dextrose in water |
| DVM | doctor of veterinary medicine |
| ER | emergency room |
| FA | forced air |
| FIV | feline immunodeficiency virus |
| FELV | feline leukemia virus |
| HD | Hot Dog thermal unit |
| ICU | intensive care unit |
| ISO | isolation |
| PT | prothrombin time |
| NMDA | N-methyl d-aspartate |
| SX | surgery |

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