

**Academy of Veterinary Emergency
And Critical Care Technicians**



Application for 2011 Examination

GENERAL INFORMATION

The Academy of Veterinary Emergency and Critical Care Technicians (AVECCT) would like to thank you for your interest in becoming a Veterinary Technician Specialist in Emergency and Critical Care – VTS (ECC). AVECCT's goal in certifying veterinary technician specialists is to assure the veterinary profession and the public that AVECCT certified technicians possess the knowledge and experience needed to work effectively in a well-equipped and staffed emergency or critical care facility. The requirements for eligibility for the examination are defined in the AVECCT constitution and bylaws (available at: AVECCT.org). Although AVECCT requirements are rigorous, they are not designed to be obstacles to prevent candidates from becoming certified. The requirements are intended to assure the public and the profession that technicians certified by AVECCT are truly qualified.

Each applicant, before he or she is declared eligible for examination must be a graduate of an AVMA-approved Veterinary Technician School and/or legally credentialed to practice as a Veterinary Technician (or foreign equivalent), in some state or province of the United States, Canada or other country. The credential requirements are set by each individual state, province or country where credentials were obtained.

ALL of the requirements must be met AFTER graduating from an AVMA-approved Veterinary Technician School or becoming legally credentialed for an applicant to be considered eligible for the examination.

For the purpose of eligibility requirements the definition of emergency and critical care as established by the Veterinary Emergency and Critical Care Society will be used and reads as follows:

- **Emergency Care** – action taken in response to an emergency. The term implies emergency action directed toward the assessment, treatment, and stabilization of a patient with an urgent medical problem.
- **Critical Care** – the care taken or required in a response to a crisis. In medicine, the treatment of a patient with a life-threatening or potentially life-threatening illness or injury whose condition is likely to change on a moment-to-moment or hour-to-hour basis. Such patients require intense and often constant monitoring, reassessment, and treatment.

The AVECCT Credentials Committee will use these definitions to determine:

1. if your work experience was in the field of emergency and critical care.
2. if the cases in the case log and case reports are emergency and critical care cases.
3. if your continuing education is related to emergency and critical care medicine.

You must submit three copies of your application. Each copy should be secured in a separate 3-ring binder, and assembled in the following order:

1. **Applicant information page** (a single copy of this form tops three application copies)
2. **Waiver, Release and Indemnity Agreement**
3. **Employment History**
4. **Photocopy of valid, current veterinary technician license/registration**
5. **Skills Form**
6. **Two Letters of Recommendation**
7. **Continuing Education Form**
8. **Case Log**
9. **Four Case Reports**

Please use/copy **ONLY** the forms provided in the downloadable application from the AVECCT website (AVECCT.org). **Do not modify any form.**

The three copies of your application, along with a check for \$40.00 made out to: 'AVECCT', should be mailed to:

VECCS, Attn. AVECCT Applications, 6335 Camp Bullis Road #12, San Antonio, TX 78257

Applications must be received at the address above on or before **January 6, 2011**. Applications received after this date will not be accepted.

The application fee will not be refunded if applicant is not approved to take the examination. Eligibility rulings are made by the Council of Regents on recommendation by the Credentials Approval Committee. Applicants will be notified of eligibility results no less than 6 months preceding the scheduled examination date.

Notification letters will be mailed by March 11, 2011. If you do not receive your letter by March 21, 2011, please contact AVECCT at: info@AVECCT.org by March 26, 2011.

AVECCT APPLICATION INSTRUCTIONS

Please read the instructions carefully. Incomplete or faulty applications will result in application rejection. Please be sure you are using the 2011 application form obtained from the website www.AVECCT.org. The application should be assembled in the following order:

1. Applicant information page (Form 1)

Before mailing your final application package, include one copy of the Applicant Information Form placed on top of the three application copies

2. Signed copy of 'Waiver, Release and Indemnity Agreement' (Form 2)

3. Completed 'Employment History' (Form 3)

A minimum of 3 years full-time work experience or its equivalent (5,760 hours), in the field of veterinary emergency and critical care medicine is required (see definitions of emergency and critical care on page 2). All experience must be completed within five calendar years prior to the application submission date. All work experience must be performed after becoming legally credentialed.

4. Photocopy of valid veterinary technician license/registration/diploma

Applicants must provide proof of current license/registration or graduation from an AVMA-approved veterinary technology program. They may provide both, if applicable. Photocopies of the actual license/registration/diploma are the only proof that will be accepted. Cancelled checks or other documents will not be accepted. Information about requirements for technician credentialing on a state by state basis can be found on the AAVSB website: <http://www.aavsb.org/DLR/DLR.aspx>

It is strongly encouraged that the candidate be a member of a local, state, provincial, or the National Association of Veterinary Technicians in America, and a member of the Veterinary Emergency and Critical Care Society. Membership in any of these organizations is optional and will not be considered when your application is scored.

5. Completed 'Skills Form' (Form 4). Be sure to include both pages of this form.

The skills form documents those nursing skills that have been mastered by the candidate and are necessary to practice veterinary emergency and critical care nursing at an advanced level. The skills form is subject to change based upon the current state of the art in veterinary emergency and critical care nursing.

Each skill must be marked 'Yes' or 'No' to attest that the skill has been mastered by the applicant. AVECCT requires that a Veterinary Technician Specialist (ECC) or a veterinarian who has mastered the skill attest, by signature, to the applicant's mastery of the skill. Mastery is defined as being able to perform the skill safely, with a high degree of success, without being coached or prompted. Furthermore, mastery requires having performed the skill in a wide variety of patients and situations. AVECCT is aware that some states or provinces may not allow a skill to be performed by a licensed veterinary technician. Twenty-four of the thirty-three skills must be mastered for eligibility. Each skill must be clearly marked as 'Yes' or 'No' and include a signature; do not use quotation marks or arrows to indicate duplication.

6. Letters of Recommendation

Two letters of recommendation are required from a VTS (Emergency and Critical Care) member, a Veterinary Emergency Critical Care Society Veterinarian, or a Diplomat of the American College of Veterinary Emergency and Critical Care.

At this time letters of recommendation will also be accepted from non-VECCS emergency clinic veterinarians and board certified specialists in anesthesia, internal medicine, and surgery.

Letters must be typed.

7. Continuing Education Form (Form 5)

Include official proof of attendance documents for each CE event. Topic titles, attendance date, location, and length of lecture must be listed. A photocopy of a document provided by the organization or speaker must be provided as proof of the attendance. Cancelled checks or other documents will not be accepted as proof of attendance.

A minimum of twenty-five hours of continuing education related to veterinary emergency and critical care are required. The continuing education must be received from a nationally-recognized conference; local, state, regional veterinary medical or technician associations; accredited veterinary school or technician school sponsored CE programs; American Association of Veterinary State Boards (AAVSB); Registry of Approved Continuing Education (RACE) approved CE; or publically advertised local meetings delivered by instructors who are considered experts on the subject they are discussing.

The AVECCT definition of emergency and critical care will be used to determine whether or not your continuing education meets the requirement regarding content. If the title of the CE does not provide enough information to show that CE was related to emergency and critical care you may submit photocopies of the course description provided by the organization presenting the CE as proof that the continuing education was related to emergency and critical care.

The continuing education must be completed within the five calendar years prior to submitting the application.

8. Case Log (Form 6)

A case record log is to be maintained from January 1 – December 31 in the year immediately preceding the submission of the application. Only cases seen during this period qualify. The cases shall reflect the management of the emergent or critically ill patient and mastery of advanced nursing skills. The log should include the following: date, patient identification (name or number), species/breed, age, sex, weight, diagnosis, length of care, final outcome, and summary of nursing care techniques and procedures performed by the applicant on the patient. If the animal's weight, age, or sex is unknown enter 'not known' in the case log. Be sure that the case log is neat and that all entries are legible and **appear in chronological order**. List individual nursing skills you performed; do not use unspecific phrases such as "critical care nursing" or "intense monitoring. Provide a key if abbreviations are used.

Candidates must submit 50 cases that meet the AVECCT definition of emergency or critical care. However, if only 50 cases are submitted, a single unacceptable case could result in your application being rejected. Therefore it is **strongly suggested** that additional cases be submitted. The case log will be used to confirm your experience in emergency and critical care medicine and your mastery of a variety of advanced nursing skills, including those found within the AVECCT Skills List. Therefore, those skills should be clearly demonstrated within the case log.

Use the enclosed 'Case Log' master form (Form 6) to make copies for completing your log. For your convenience, a computer version of the case log form that can be filled in using Adobe Acrobat has been included on the AVECCT website: www.avecct.org. If you wish to fill in your Case Logs on computer, use this form. Please carefully read the instructions included with the form. **Do not alter form.**

Please **highlight** the four cases used for your case reports.

9. Four case reports

See examples included in this package. The case reports must be selected from the case log and those cases should be highlighted in the case log.

The reports **must** be typed and **double spaced**. Case reports **must not exceed five pages each**. Case reports not meeting these requirements will be rejected. The following manuscript form should be used: Times New Roman font; margins justified and 0.5" top, bottom, and sides; top right of each page: **CASE REPORT # __**, **APPLICANT NAME, PAGE #**, font size 10, all caps, bold; **Headings** capitalized, font size 10, bold; body font size 10.

See case report examples.

Case reports must demonstrate expertise in the nursing management of a variety of veterinary patients requiring emergency and critical care. Case reports must be the original work of the applicant.

Select cases that will demonstrate your expertise in emergency and critical care nursing. Be sure that information such as the patient's name, identification number, and date the case was seen is included in the report. The case report should describe, in detail, how the patient was diagnosed and treated. The case report must also be used to demonstrate how you used your knowledge and experience to assist the veterinarian in diagnosing and treating the patient. It is important that the information in your case report can be clearly understood. Present each case in a logical manner, check spelling, use generic drug names, and define any abbreviations that are not commonly used, e.g. positive end-expiratory pressure (PEEP). It is important to show that *you* participated in the diagnosis, treatment, and nursing of the patient and were not just an observer. It is also important to demonstrate *your* depth and comprehension of knowledge about the case that you have chosen. Consider some of the following ways of demonstrating your knowledge and experience:

- Show how *your* observations, physical examination, and history-taking assisted the veterinarian with the diagnosis. The easiest way to do this is to write in the first person, using "I" statements. "I placed a 20g intravenous catheter in.....", "I was concerned about the patients vomiting and suggested.....", "The lab results showed.....and I"
- Explain why an observation was important or why *you* asked a certain question while taking the history.
- Describe the procedures *you* assisted with or performed. Explain why the procedure was indicated, possible contraindications, and nursing care requirements.
- Describe how *you* assisted the veterinarian in treating the patient.
- Explain how *you* helped determine whether the patient's treatment was being effective.
- Explain how *your* observations and monitoring helped the veterinarian modify the patient's treatment.
- Explain *your* role in planning the patient's care.
- Show *your* understanding of the problem being treated. Brief explanations of pathophysiology help to demonstrate your knowledge base.

FORM 1

AVECCT APPLICANT INFORMATION PAGE

A single copy of this page is to be placed on top of the three copies of your application before they are submitted. It will assure that you receive your notification letter and that your check is properly recorded. Please PRINT or type this page. It is important that we can read all information.

Applicant Name: _____

Current Address: _____

Address where you, the applicant, want your letter of notification sent: Same as Above () OR

Home phone #: _____

Work phone #: _____

An email address where we can contact you if needed: _____

Please attach a check or money order payable to “AVECCT” for \$40.00. Note for International Candidates, payment must be by Money Order or Bank Draft in US Funds.

WAIVER, RELEASE, AND INDEMNITY AGREEMENT

I hereby submit my credentials to the Academy of Veterinary Emergency and Critical Care Technicians for consideration for examination in accordance with its rules and enclose the required application fee. I agree that prior to or subsequent to my examination; the Board may investigate my standing as a technician, including my reputation for complying with the standards of ethics of the profession. I understand and agree that the application fee shall be nonrefundable.

I agree to abide by the decisions of the Board of Regents and thereby voluntarily release, discharge, waive and relinquish any and all actions or causes of actions against the Academy of Veterinary Emergency and Critical Care Technicians and each and all of its members, regents, officers, examiners and assigns from and against any liability whatsoever in respect of any decisions or acts that they may make in connection with this application, the examination, the grades on such examinations and / or the granting or issuance, or failure thereof, of any certificate, except as specifically provided by the Constitution and Bylaws of the organization. I agree to exempt and relieve, defend and indemnify, and hold harmless the Academy of Veterinary Emergency and Critical Care Technicians, and each and all of its members, regents, officers, examiners and assigns against any and all claims, demands and / or proceedings, including court costs and attorney's fees, brought by or prosecuted by my benefit, extended to all claims of every kind and nature whatsoever whether known or unknown at this time. I further agree that any certificate, which may be granted and issued to me, shall be and remain the property of the Academy of Veterinary Emergency and Critical Care Technicians.

I certify that all information provided by me on the application is true and correct. I acknowledge that I have read, understand and agree to abide by the above two paragraphs.

(Signature)

(Date)

(Please print your name)

EMPLOYMENT HISTORY

Name _____
(Last) (First) (Middle Initial) (Maiden)

Address _____
(Street) (City) (State/Province) (Zip Code) (Country)

Phone: Home (____) _____ Work (____) _____

Email: _____

Present Occupation: _____

Credentials (RVT, CVT, LVT, AHT): _____

Have you graduated from an AVMA approved school of veterinary technology? No () Yes ()

List school name _____

Date graduated _____ (month/year)

City & State _____

Are you *currently* licensed/registered/credentialed to legally practice in any state or province?

No () Yes ()

List all states you are licensed in

State _____ Date first issued _____ (month/year)

State _____ Date first issued _____ (month/year)

Estimate, as accurately as possible, how many hours you have spent practicing emergency or critical care veterinary nursing **since becoming** a credentialed veterinary technician in the last five years.

_____ hours

EMPLOYMENT HISTORY (cont.)

List your employment history as a credentialed veterinary technician. Print additional copies of this form as necessary.

Name of practice/institution Address, City, State Contact person telephone # Contact person email	Average number of hours worked per week	Type of practice (general, referral, emergency, etc.)	Starting date (MM/DD/YY) Ending date (MM/DD/YY)	Percentage of time devoted to emergency critical care medicine

SKILLS FORM

Name _____

The applicant is required to state whether or not he/she has mastered the skill on the form. **Mastery is defined as being able to perform the task safely, with a high degree of success, without being coached or prompted. Mastery requires having performed the task in a wide variety of patients and situations.** AVECCT is aware that some states or provinces may not allow a task to be performed by a licensed veterinary technician. AVECCT requires that a Veterinary Technician Specialist (Emergency and Critical Care) or a veterinarian who has mastered the skill, attest to your mastery of the skill.

Skill	Mastered (Yes or No)	VTS (ECC) or DVM who can attest to applicant's mastery of skill
Identify abnormal heart sounds with a stethoscope		
Identify abnormal lung sounds with a stethoscope		
Measure central venous pressure		
Measure systemic arterial blood pressure		
Measure arterial oxygen saturation with a pulse oximeter		
Insert a central venous catheter		
Insert a urinary catheter in a female dog or cat		
Insert a urinary catheter in a male dog or cat		
Insert a nasogastric tube		
Cystocentesis		
Placement of nasal cannula for oxygen administration		
Administer oxygen with a tracheal catheter		
Endotracheal intubation		
Intraosseous catheter placement		
Continuous chest drainage		
Positive pressure ventilation		
Collect an arterial blood sample		
Gastric lavage		
CPR chest compressions		
Defibrillation		
Blood culture collection		
Measure mucosal bleeding time		
Measure activated clotting time		

Continued on page 2

SKILLS FORM (continued from page 1)

Skill	Mastered (Yes or No)	VTS(ECC) or DVM who can attest to applicant's mastery of skill
Abdominocentesis		
Thoracocentesis		
Decompress the stomach using a needle or catheter in A patient with gastric dilatation and volvulus		
Resuscitate a newborn puppy or kitten after a c-section		
Care for a patient with a tracheostomy tube		
Care for a patient with a chest tube		
Care for a patient with a urinary catheter		
Recognize patients needing treatment for pain		
Recognize signs of respiratory failure		
Recognize signs of shock		

Please print the names of all persons who have signed this form attesting to your mastery of advanced nursing skills.

Name _____ **Credentials** _____ **Date** _____

Phone Number _____ **Email** _____

Name _____ **Credentials** _____ **Date** _____

Phone Number _____ **Email** _____

Name _____ **Credentials** _____ **Date** _____

Phone Number _____ **Email** _____

Name _____ **Credentials** _____ **Date** _____

Phone Number _____ **Email** _____

(Applicant's Signature)

(Date)

Please print out an additional form for each CE event attended

Revised 2007

FORM 5

CASE LOG

Applicant's Name _____ Page _____ of _____

Date _____ Species _____ Sex _____ Age _____ Wt _____ Patient ID _____

Diagnosis _____

Nursing procedures I performed _____

Outcome _____ Length of care _____

Date _____ Species _____ Sex _____ Age _____ Wt _____ Patient ID _____

Diagnosis _____

Nursing procedures I performed _____

Outcome _____ Length of care _____

Date _____ Species _____ Sex _____ Age _____ Wt _____ Patient ID _____

Diagnosis _____

Nursing procedures I performed _____

Outcome _____ Length of care _____

Date _____ Species _____ Sex _____ Age _____ Wt _____ Patient ID _____

Diagnosis _____

Nursing procedures I performed _____

Outcome _____ Length of care _____

Date _____ Species _____ Sex _____ Age _____ Wt _____ Patient ID _____

Diagnosis _____

Nursing procedures I performed _____

Outcome _____ Length of care _____

CASE REPORTS

The following two examples are for you to use as a guide while writing your case reports.

SIGNALMENT:

Bailee, 3 year old Staffordshire Terrier (FS), weight 21kg, # 8675309

HISTORY:

Bailee was referred to the Ontario Veterinary Hospital for evaluation of possible septic peritonitis. She had undergone an exploratory laparotomy and multiple enterotomies six days previous to remove a linear foreign body from the jejunum. Prior to that, she had a two week history of intermittent vomiting and diarrhea.

INITIAL PHYSICAL EXAM:

Upon presentation, Bailee appeared very depressed. She was pyrexia (39.7C), a little tachycardic (120bpm), respiratory rate 40, with very injected and tacky mucous membranes. Dorsal pedal pulses palpable, but non-invasive BP measurements revealed hypotension (115/53, MAP 69). Dehydration was estimated at 10%. A grade II/VI systolic heart murmur was noted. Lung sounds were normal. Her abdomen was distended and a fluid wave was palpable. Serosanguinous fluid was seen dripping from the abdominal incision site. EKG revealed a normal sinus rhythm.

INITIAL INTERVENTIONS:

I placed two cephalic, 18G 2" IV catheters. A 2L bolus of P-148 was initiated and given over the next hour. A 300 ml bolus of Pentastarch was given as an initial intervention for the hypotension. Antibiotics were started (enrofloxacin 5mg/kg). I drew the entry blood for our ICU's quick assessment tests, in addition to a CBC. An abdominal tap was performed by the veterinarian. It revealed many degenerative neutrophils and both intracellular and extracellular bacteria (rods and cocci). An immediate exploratory laparotomy was planned.

LAB RESULTS:

Laboratory tests revealed an elevated PCV (55%) and moderate hypoproteinemia (TS 4.6/L). Considering her hypovolemic state, her true PCV/TS were assumed to be considerably lower. Glucose was low normal at 3.7mmol/L. Her blood urea nitrogen stick (Azostix) was elevated at 30-40mg/dl. Electrolytes showed a hyponatremia (129mmol/L) and a decreased chloride (100mmol/L), potassium was normal. Blood gases revealed a metabolic acidosis with little or no respiratory compensation (pH 7.330, PaCO2 36.4, HCO3 18.1, ABE -5.6). Her activated clotting time (ACT) was prolonged at 135 seconds. I placed a urinary catheter and Bailee was taken to surgery.

SURGICAL INTERVENTION:

The exploratory laparotomy revealed a large volume of serosanguinous fluid with particulate matter. All three previous enterotomy sites had dehisced. A markedly inflamed and edematous pancreas was seen. Cultures and tissue samples were

taken. Two enterotomy sites were debrided and repaired. Eight inches of jejunum around the last enterotomy site was dissected and an anastomosis performed. The abdomen was lavaged with large amounts of sterile saline, but due to the severity of the septic peritonitis, the abdomen was left open to facilitate drainage and a sterile abdominal bandage was applied.

PATIENT MANAGEMENT CONCERNS:

- Hypotension; due to decreased oncotic pressure secondary to protein loss into the abdomen, and/or hypovolemia due to third spacing into the abdomen, and/or vasodilation related to sepsis (visible by Bailee's already injected mucous membranes)
- Pain management; involving both the post-operative requirements and the potential for severe pain from the concurrent pancreatitis
- Decreased renal perfusion; an issue due to the potential for hypotension and hypovolemia (if MAP is <60, then renal perfusion can be compromised)
- DIC (Disseminated Intravascular Coagulation), a concern in any severe trauma or disease state due to the large inflammatory response, and Bailee's elevated ACT
- Rapid correction of the hyponatremia: if the Na is increased faster than 0.5mEq/hr, there is danger of neurological signs secondary to the loss of cellular equilibrium in the brain. Na moves quickly into the cells and water moves too quickly out, the cell shrinks resulting in possible lethargy, seizures, and coma
- Adequate nursing care; due to the recumbent nature of the patient and the known potential for extreme fluid loss in the abdomen, watching for seepage from the abdominal bandage, and closely monitoring this patient's ins and outs is vital

IMMEDIATE POST-OPERATIVE INTERVENTIONS:

A nasal cannula was placed by the ICU nurse and oxygen was delivered at 2L/min, as during surgery Bailee's oxygenation was poor. The first of two FFP transfusions over the next 8 hours was started (following standard test dose protocol and monitoring for reaction). Her post-operative PCV was 32%, with a TS of 3.0g/L. Bailee was very hypotensive (52/35, MAP 40). A dopamine CRI was started at an inotropic dose of 5ug/kg/min, this was eventually increased to 10ug/kg/min, needed to maintain her Map over 60.

Over the next 8 hours, urine production was poor, just reaching 1ml/kg/hr with sp. G 1.040-1.050. Crystalloid therapy remained P-148, at 3-4 times maintenance rates. Several 150ml boluses were given to increase urine production and to keep up her blood pressure. A 20ml/hr CRI of Pentastarch was also maintained. In addition to the FFP, this was given to try and maintain her oncotic pressure and keep fluids in the intravascular space.

Oxymorphone IV (0.05mg/kg) was given frequently for pain management. Temperature, heart rate and respiration were monitored constantly, all remained elevated. Continuous EKG showed a normal sinus rhythm. Her post-operative ACT was significantly greater (>4 min.). Bailee continued to have a metabolic acidosis. Her electrolytes were slowly improving and by 12 hours post presentation, her sodium was 134mmol/L.

Her bandage was monitored for signs of seepage, which would make a bandage change necessary. If the outer layers of the bandage get wet, they can 'wick' bacteria into the open abdomen. Clindamycin (10mg/kg) was added to her antibiotic regime.

FURTHER INTERVENTIONS:

Into the second day, Bailee became more stable. Blood pressure improved (MAP 100), and the dopamine CRI was slowly weaned off. Urine production improved to normal limits. The metabolic acidosis had resolved. The fluids were changed to 0.9% NaCl with 20 mEq/L KCl to further improve her slight hyponatremia. Fluids remained at four times maintenance rates, but potassium administration did not exceed 0.5mEq/kg/hr. Arterial blood gases showed good oxygenation, and the oxygen administration was decreased to 1L/min.

Her ACT had increased slightly (140 sec). The veterinarian decided she should receive two additional FFP transfusions through the day, to treat increasing ACT and the growing concern of DIC. Heparin therapy was also initiated to prevent possible DIC. Her total solids were maintained from around 3.2 to 3.4g/L. A human albumen transfusion was started, but after a few hours of administration, Bailee developed significant facial swelling. I stopped the transfusion, notified the veterinarian, and she was treated with diphenhydramine IV (2mg/kg). The swelling subsequently improved. Her PCV decreased by 8%, and a packed RBC transfusion was given. The PCV subsequently increased to 24%.

I assisted with the placement of a double lumen jugular catheter (MILA). Partial parenteral nutrition was then initiated. Due to the pancreatitis and the state of her GI tract, it would be a while before Bailee would be able to have any oral nutrition. Oxymorphone continued to be administered as needed (q4hr), and bandage changes occurred almost every 8 hours. She continued to lose copious amounts of fluid into her abdomen.

All vitals continued to be monitored frequently (she was at risk for fluid overload and subsequent pulmonary edema, due to the hypoproteinemia and high fluid rate). All remained within normal limits. Fluid ins and outs were closely monitored and appeared balanced. Recumbent patient care was initiated. The patient was moved from right to left lateral recumbency to decrease the risk of lung atelectasis and peripheral edema. Physiotherapy was initiated. All catheters were checked and maintained to reduce the risk of infection.

CONTINUED CARE: Over the next 3-6 days, Bailee continued to improve. On the third day she went back to surgery for a laparotomy and lavage and on the sixth day this was repeated and the abdomen closed. Post-operative blood pressures remained

stable. She continued to receive a number of FFP transfusions during this time to keep up with the protein losses and because of her pancreatitis. Vital stats remained within normal limits. Laboratory values remained stable, including the ACT, which was within normal limits on the fifth day. Urine production was good and her fluid rate was decreased slowly. Bailee's attitude and demeanor were improving rapidly.

By the sixth day, blood work revealed normal pancreatic values and that evening she was started on oral food. Small amounts of an intestinal formulation (very easily digestible) were offered and accepted readily. Once her oral intake met her caloric requirements, the PPN was discontinued. The urinary catheter was pulled. She developed frequent episodes of diarrhea, but this was attributed to a number of factors; gastrointestinal irritation and motility problems secondary to the resolving septic abdomen and the reintroduction of solid food. This slowly improved. Bailee was discharged home 11 days after presentation to the unit.

SIGNALMENT

Frankie, one-year-old male Australian Shepherd; approximately 50#; MR #606184

HISTORY

Frankie presented to the referring veterinarian at 0900; one half hour after being kicked by a horse. The owners did not know what part of his body had been kicked. Frankie was found 10 minutes later, unresponsive and gasping for breath. A cephalic IV catheter was placed and approximately 1500 mls LRS and 500mg prednisolone sodium succinate was given. An attempt was made to lower the dog's temperature (106.4F) by cool water rinsing. Oxygen therapy by mask was also delivered until time of transfer to our emergency service at 1300hrs.

INITIAL PHYSICAL EXAMINATION

Frankie presented to the ICU laterally recumbent. Upon my triage exam, I found Frankie to be unresponsive, hypoventilating, and hyperthermic (104F). He was cyanotic, tremoring with muscle fasciculations, and both pupils were miotic and fixed (negative pupillary light response). Frankie was tachycardic at 170bpm, and I heard considerable upper airway noise on inspiration. His expiratory efforts were quite diminished giving a gasping effect to every breath. No external signs of trauma were present aside from scleral hemorrhages OU.

INTERVENTIONS

I applied pulse oximetry and continuous ECG immediately. A SpO2 of 89% indicated Frankie needed oxygen supplementation; and according to his presenting signs of head trauma, we also needed to lower his CO2 in an effort to reduce intracranial pressure. Given the patient's stuporous mentation, intubation was possible without any sedation or anesthesia; although it did prove to be quite difficult due to a large amount of laryngeal swelling present. Once intubated, bloody fluid refluxed up through the endotracheal tube indicating pulmonary edema, most likely of neurogenic origin. It is believed that neurogenic pulmonary edema can result from head trauma or secondary brain injury. It could also result from the direct thoracic trauma. Careful suctioning was done to clear the airway. I was cautious due to a danger of increasing intracranial pressure if Frankie coughed. A vagal response of decreasing heart rate and possible cardiac arrhythmias might also occur with careless suctioning.. An arterial blood gas/electrolytes revealed high CO2 and O2 (on 100% O2), and acidosis (CO2 58.9mmHg, O2 500mmHg, and pH 7.148).

Frankie was placed in sternal recumbency (to fully ventilate his lungs equally) with his head at approximately a 20 degree angle (to help decrease intracranial pressure ICP). Hyperventilation was also used to try to decrease ICP. The cool metal table and cold packs around Frankie helped to decrease his temperature. Intravenous fluids were not pushed due to both the pulmonary edema and the neurologic signs. The ECG tracing remained stable with a normal sinus rhythm, but still slightly tachycardic (150bpm).

I administered furosemide IV within the first 15 minutes, followed by a mannitol infusion over 30 minutes. These were given to treat the increased ICP. Frankie was beginning to tremor more and was exhibiting opisthotonus, so diazepam was given IV to

control seizures. A neurology consult advised full radiographs, CT scan, and careful use of mannitol. That advice (regarding mannitol) is due to a contraindication of this drug administered in the presence of intracranial hemorrhage. Mannitol may leak out into the brain at the site of the hemorrhage and actually pull more fluid into that specific area. A routine CBC, serum chemistry, and repeat arterial blood gas were submitted. A CT scan of the skull, along with cervical spine and thoracic radiographs were requested. I placed an indwelling urinary catheter to monitor urine output and assist in cleanliness.

The thoracic radiographs showed no further evidence of pulmonary edema; but did reveal a moderate interstitial pattern compatible with hypoinflation. Frankie's cervical radiographs showed no abnormalities. The skull radiographs revealed multiple fractures of the right parietal and right temporal bones. The CT scan of the skull further defined the fractures as including the occipital bone. Ventral displacement of the occipital bone segments, along with medial displacement of the parietal and temporal bone segments were visualized. Obscured visualization of the right ventricle and displacement of the midline falx to the left indicated the high degree of inflammation present. Also, increased densities in the ventral cerebrum were indicative of acute hemorrhages. Debate followed among the neurologists concerning surgery to remove segment of bone in order to alleviate ICP. The owners requested a few hours to thoroughly consider the option.

Two and one half hours after admission, Frankie was returned to ICU to be placed on a ventilator. Since admission, the patient had been manually hyperventilated on 100% oxygen. I set up the BEAR 2 Adult Volume ventilator with the humidifier chamber (temperature controlled), and the color-coded lines (to ease set up). No sedation or anesthesia was necessary due to the patient's mentation (now comatose). Frankie no longer vocalized in response to any kind of stimulus.

The goal in setting the ventilator would be to lower his CO₂ (again, to decrease the intracranial pressure), and maintain the pliability of his lungs by full inflation. After the initial settings, adjustments were made according to arterial blood gas results taken at q30 minutes. By means of hyperventilation, the CO₂ was kept between 27-30mmHg. The ventilator settings were as follows: simultaneous intermittent mandatory ventilations (SIMV) mode; tidal volume @ 10mls/kg; normal pressure limit at 20ml; O PEEP (none planned until lungs show noncompliance); 40% oxygen.

One hour after the start of ventilation, Frankie began to have seizure activity. Diazepam was administered again, followed by a loading dose of phenobarbital IV. I placed a double lumen catheter in the right saphenous vein in preparation for total parenteral nutrition (TPN) administration. I did not use a jugular vein due to risk of increasing ICP. A jejunostomy tube would be another option for nutrition during Frankie's hypermetabolic state (due to head trauma). This would have to be placed surgically, if he went for cranial decompression. Both a PEG tube and an NG tube are inappropriate due to his mentation (risk of vomiting and aspiration). An attempt to place an arterial catheter was unsuccessful, so doppler blood pressures were monitored until an arterial line could be placed. Frankie was started on a minimal IV infusion of hetastarch along with his LRS (colloid/crystalloid combination) to maintain

his fluid volume and blood pressure. His diastolic pressures remained at 80-85mmHg. Minimal adjustments to the endotracheal tube were made in an attempt to avoid any stimulus that would cause an increase in ICP (example: cough). I made slight changes in cuff inflation, and very slight changes in position, every hour. Saline flushes and suctioning were scheduled for BID only.

OUTCOME

Six hours after ventilation support, Frankie's body temperature and heart rate began to increase. His rectal temperature was >106F, and his heart rate reached 180bpm. Frankie's pupils remained fixed (no pupillary light response), but were now dilated. Generalized muscle rigidity was beginning to appear. Neurological signs of this nature indicate cerebral herniation or very severe brain stem damage. There was no real chance for this patient to recover from the amount of trauma and secondary injury (edema and hemorrhage) to the brain. After a discussion with the owners by telephone, Frankie was euthanized. No necropsy was performed.