

Policies and Procedures

SECTION: IACUC	NUMBER: 7.16			
CHAPTER: Miscellaneous Experimental Animal Use Policies	ISSUED: 5/23/2005	REV. A: 4/7/2009	REV. B: 11/2012	REV. C:
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Purpose

The purpose of this policy is to delineate and describe clear guidelines for surgical procedures utilizing the large animal model. This procedure is approved by the Creighton University Institutional Animal Care and Use Committee (IACUC). All investigators will follow this policy unless scientific justification is provided and approved by the IACUC.

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1. Introduction

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This Policy describes the standard of veterinary care expected to be provided by Principal Investigators who anesthetize large animals for performing surgical and non-surgical procedures as outlined in a Creighton University IACUC approved animal protocol. This document outlines the expected veterinary care that the Principal Investigator (PI) will provide the animal pre- and post-procedure, as well as during the procedure. Deviations from this procedure should be clearly spelled out and justified in the investigator's IACUC-approved protocol, as well as a revised version of this Policy.

Appropriate veterinary care must be provided to all experimental animals in accordance with the requirements of:

- The *Guide for the Care and Use of Laboratory Animals* (The *Guide*), Institute of Laboratory Animal Resources, National Research Council, 1996
- Animal Welfare Regulations (AWR, CFR 1985); and
- Public Health Service Policy on Humane Care and Use of Laboratory Animals (PHS Policy, 1996)

A key component of what is deemed appropriate veterinary care pertains to monitoring and documenting the animal prior to, during, and following an intervention. It is critical that all individuals involved in these procedures familiarize themselves with the forms required by the Creighton University IACUC and Animal Resource Facility. These forms (and directions for their use) are contained in the Animal Resource Facility Policies.

2. Responsibility

The major responsibility for animal protection and monitoring during and after a procedure lies with the PI. Any instances in which a PI or staff member fails to provide veterinary care in accordance with this Policy is considered an infraction by the Creighton University IACUC and may result in suspension of a protocol and/or the privilege of an individual to perform animal research. Serious infractions may result in a loss of the ability to utilize data generated as a result of the study. This Policy applies to any Creighton University faculty, resident, staff, student, or fellow who participate in the care of large animals which undergo anesthesia during surgical as well as non-surgical interventions. It is the responsibility of the PI to ensure that all individuals involved in a procedure on an animal are aware of their duties and responsibilities, the appropriate contact individuals should problems arise during or after a procedure, and that all individuals read and understand this Policy.

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A detailed listing of Responsibilities for Animal Protection and Monitoring is found in the policies of the Animal Resource Facility. Responsibilities included in that document cover the PI, the Animal Resource Facility, the Veterinarian-in-Charge, and the IACUC. All individuals involved in Non-Rodent Mammal Category D and E Procedures should read that document and understand their obligations prior to participating in these types of procedures.

3. Large animal Policy Cover Page

The cover page located in Appendix 1 must accompany the Investigator's Large animal Surgical Procedure SOP submission for approval. It must clearly identify the PI and protocol the SOP is intended to cover. Check the appropriate box indicating if the IACUC Standard Large animal Surgical Procedure will be followed or if modifications are proposed based on scientific or Investigator preferences.

4. Emergency Contact Information

An emergency contact list must be provided, must be protocol specific and will include the following information:

- A comprehensive list of responsible personnel, *in the specified order* of contact.
- Office, lab, home, pager, and/or cell phone numbers as applicable.

This list will be present in the Animal Housing area and will be utilized by Animal Resource Facility (ARF) personnel as well as Investigator's staff, in the event a medical emergency arises. It is imperative that responsible parties be readily available to respond to all animal health problems in order to remain in compliance with federal regulations requiring appropriate veterinary care. If the primary contact is not reachable or does not respond to paging within 15 minutes, the next person will be contacted. This process will continue through the list provided until such a time appropriately trained personnel are contacted to attend to the animal's medical needs. In the event contact personnel cannot be reached, the ARF Manager or Director will obtain treatment, appropriate to the identified health problem. This may include, but not be limited to, services provided by outside Veterinary professionals. The costs of such services will be the Investigators responsibility. An appropriate emergency contact chart is located in Appendix 2.

5. Potential Post-procedural Complications

Provide a detailed list of potential post-procedural complications specific to each surgical procedure approved in the applicable IACUC protocol. This information is likely to be included in the Assessment portion of the Animal Medical Record and may include a

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problem list, differential diagnosis, diagnoses. Provide a treatment plan for *each* complication using the SOAP format (detailed in the Animal Medical Records Policy 7.13).

- Subjective: Abnormalities likely to be observed and/or the relative severity of conditions such as decreased appetite or activity; diarrhea or constipation; bleeding; open wounds; coughing, sneezing, nasal or ocular discharge; depth and character of respiration; mental attitude.
 - Objective: Measurable clinical parameters, often the result of a physical examination, such as body temperature, heart rate, and respiratory rate (TPR); lesion size. Include details indicating how these parameters would likely deviate from normal (increase in heart rate, decrease in body temperature)
 - Plan: Plan for how to progress with diagnosis and care. This must detail specifics pertaining to treatment, observation and re-evaluation times, additional diagnostic tests, euthanasia. Include information relevant to first responders to assure appropriate support is provided immediately to the animal.

6. Pre-operative Care

- a. Purpose
The purpose of this Policy is to describe the steps taken to care for animals received and housed prior to undergoing IACUC approved operative procedures.
 - b. Application
This policy applies to all Creighton University faculty, staff, residents, students, and fellows who provide pre-operative care.
 - c. Associated Policies
Animal Medical Records 7.13
Aseptic Surgery 7.11

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d. Procedure

- Pre-operative care of animals received and being housed in the animal resource facility.
- i. Animals will be purchased from an approved vendor, housed at the Creighton University Animal Resource Facility and will be allowed a minimum of 7 days acclimation period. At the time of receipt, the tattoo number or other form of identification will be confirmed to be accurate based upon the Health Certificate or other applicable documents provided by the vendor.
 - ii. The animal will be received into the ARF and a physical examination (minimum Temperature, Pulse and Respiration (TPR); and body weight) will be preformed within 12 hours of receipt by ARF staff and recorded on Animal Medical Record Progress Notes (Form MED2).
 - iii. The tattoo number or other form of identification will be compared to that documented on the Animal Medical Record Summary and Progress Notes (Forms MED1 and MED2).
 - iv. The Principal Investigator or designee will perform a physical examination on the dog within 48 hours of arrival and just prior to (within 2 hours) the initiation of the surgical procedure. The results will be documented on Form MED2.
 - v. For all survival surgeries, the animal will be taken off food 12 hours prior to surgery.
 - vi. For all gastric surgeries, the animal will be taken off food for 24 hours and water 2 hours prior to surgery.

7. Anesthesia

a. Purpose

The purpose of this section of the Large animal Surgical Procedures Policy is to describe the steps taken when anesthetizing or sedating animals undergoing surgery or non-surgical procedures requiring sedation and/or anesthesia.

b. Application

This policy applies to all Creighton University faculty, staff, residents, students, and fellows who provide anesthesia support to the animal.

c. Associated Policies

Animal Medical Records 7.13

Aseptic Surgery 7.11

d. Procedure

Anesthetic care of dogs.

- i. Immediately prior to pre-medication, the dog will have a physical examination and findings recorded in medical record Form MED2. If significant abnormalities are found the procedure will be aborted and the Animal Resource Facility Manager and Veterinarian-in-Charge contacted to establish a plan of action for

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- that dog. If no significant abnormalities in the physical exam exist then the procedure may continue. The dog will be given an IM analgesic and the pre-anesthetic drugs and antibiotics if indicated. Dosage, time and route of administration will be recorded in the Animal Medical Record Anesthesia Record (Form VET1)
- ii. Twenty minutes after the pre-anesthetic drugs have been administered, the animal will be moved to the pre-operative room and an indwelling IV access catheter will be established. A bag of warmed IV fluids (0.9% NaCl) will be connected and administered at a rate of 10ml/lb the first hour, and 5 ml/lb the second and subsequent hours. The tattoo number or other form of identification will be compared that documented on the Animal Medical Record Summary and Progress Notes (Forms MED1 and MED2).
 - iii. The dog will be induced with Propofol intravenously (section 8 Large animal Drugs & Dosages) to facilitate endotracheal intubation. Time and amount given must be noted on Form VET1. The dog will be immediately intubated with a cuffed endotracheal (ET) tube appropriate to the size of the animal.
 - iv. The ET tube cuff will be inflated to ensure that the tube stays in place and to eliminate the possibility of aspiration of gastric contents.
 - v. The ET tube will be secured with rolled gauze around the tube itself and then around the nose or mandible of the dog. Both sides of the chest will be auscultated at this time to ensure proper placement of the ET tube.
 - vi. Immediately after intubation in all procedures, whether survival or acute, the heart rate, respiratory rate, palpebral reflex (eye blink), and pedal reflex (toe squeeze) will be tested to determine the level of consciousness.
 - vii. Based on the level of consciousness the Isoflurane gas percentage will be adjusted to achieve stage III plane II surgical anesthesia. The gas level will be recorded, along with the time it is started, on Form VET1.
 - viii. Stage III plane II surgical anesthesia is characterized by unconsciousness, muscular relaxation, absence of palpebral reflex, absence of pedal reflex, and a regular respiration rate of 10-12 breaths per minute.
 - ix. The anesthetic gas mixture percentage and time started will be noted as "Anesthesia Start Time" on Form VET1.
 - x. From anesthesia start time, vital signs will be monitored and recorded on Form VET1 a minimum of every 10 minutes throughout the procedure.
 - xi. Intra-operative monitoring will consist of measuring and recording capillary refill time (CRT) and mucous membrane color (MM) to establish adequate circulatory perfusion (CRT time of less than 2 seconds, MM color – pink). TPR will also be recorded with Heart rate (60-100 bpm), respiratory rate (10-12 rpm), and temperature.

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- xii. The surgical site will be prepared by shaving with electric clippers and all hair clippings will be vacuumed to minimize contamination. The patient is shaved and scrubbed in the prep area (Betadine scrub followed by Isopropyl alcohol rinse will be performed twice) and is given a final sterile scrub (final Betadine scrub and Isopropyl alcohol rinse followed by a Betadine solution paint which will be allowed to dry.) will be performed in the operating room.
- xiii. The animal will then be placed onto the operating table and the feet will be secured with a soft gauze roll. A warm water-circulating blanket will be in place on the table to help maintain body temperature. Blankets or towels may also be draped over portions of the dog to help maintain body temperature.
- xiv. Anesthesia will be maintained using a rebreathing bag allowing the animal to breathe spontaneously. The rebreathing bag will be sized according to the size of the animal. It should hold 3-5 times the tidal volume which is measured as 10-15 ml/kg.
- xv. The Oxygen flow rate will be determined by the ability of the anesthesia machine to keep the rebreathing bag $\frac{3}{4}$ full between breaths. The O₂ flow rate (l/min) will be recorded on Form VET1.
- xvi. A final sterile scrub is performed, Betadine scrub and Isopropyl alcohol rinse followed by a Betadine solution paint which will be allowed to dry. Prior to surgical incision, administer Carprofen SC.
- xvii. IV fluids will continue to be kept warm throughout the surgical procedure.
- xviii. A real time rectal or esophageal temperature probe will be put in place to measure body temperature throughout the procedure. A standard rectal thermometer will be used to verify the performance of the probe. The dog will be connected to an Electrocardiogram (EKG) and pulse oximeter to be monitored throughout the entire surgical procedure and if possible several print outs of the EKG will be kept in the medical record.
- xix. Vital signs will continue to be checked and recorded every ten minutes. Any vital signs that are found to be outside normal parameters will be reported to the surgeon and the vaporized anesthesia gas will be adjusted or discontinued accordingly. All adjustments will be recorded on both Form VET1 and Animal Medical Record Operative Report (Form VET2).
- xx. If vapor is discontinued, the anesthetic circuit will be removed from the animal, flushed with 100% Oxygen to clean out any residual gas, and replaced. The system will be flushed with Oxygen to refill the rebreathing bag with O₂ and the animal will be supported on 100% Oxygen until stable.
- xxi. The appropriate measures will be taken to bring vital signs into normal range and/or a decision will be made at that time by the investigator as to whether or not

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to proceed or to cancel the procedure. All such measures and any medications administered will be recorded on both Forms VET1 and VET2.

- xxii. The surgeon will be ready to proceed with the procedure.

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Large animal Drugs & Dosages

a. Purpose

The purpose of this section of the Large animal Surgical Procedures Policy is to provide recommended anesthetic, analgesic and euthanizing drugs and their dosages.

PRE-ANESTHESIA		
Drug	Dose	Concentration
Glycopyrrolate	0.011 mg/kg IM	0.2 mg/mL
Acepromazine	0.11 mg/kg IM (maximum 1 mg)	10 mg/mL
Butorphanol	0.2 mg/kg IM	10 mg/mL
Mix glycopyrrolate, acepromazine and butorphanol in one syringe and give IM for pre-medication		
In addition, administer Carprofen SQ (see recommended dose below) prior to incision.		
INDUCTION		
Drug	Dose	Concentration
Propofol	3.0-4.0 mg/kg IV to affect to induce for intubation	10 mg/kg
INHALANT ANESTHESIA		
Agent	Use	Concentration
Isoflurane Precision vaporizer delivery	Induction Maintenance	3-4% 1-2%
ANALGESIC (pre and post operative)		
Drug	Dose	Concentration
Carprofen nonsteroidal anti-inflammatory approved for post op pain- start 24 hours after pre-op dose	4.4 mg/kg SC, q 24 hours	50 mg/mL
Carprofen *not recommended post-op for gastric surgery	2.2 mg/kg *p.o.	25, 75, 100 mg
<i>If pain control is needed in addition to Carprofen one of the following analgesics may be administered:</i>		
Butorphanol	0.2-0.4 mg/kg q 1-4 hours IM or SC if more pain control is needed besides carprofen.	10 mg/mL
Buprenorphine	0.01-0.015 mg/kg Q 6-12 hours IM or SC	0.3 mg/ml
EUTHANASIA		
Beuthanasia-D	1.0 mL/10 lb IV	

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9. Intra-operative Monitoring

a. Purpose

The purpose of this section of the Large animal Surgical Procedures Policy is to describe the steps taken to monitor the intra-operative health and anesthetic depth of animals undergoing anesthesia or sedation.

b. Application

This policy applies to all Creighton University faculty, staff, residents, students, and fellows who work in the research surgical area.

c. Associated Policies

Animal Medical Records 7.13

Aseptic Surgery 7.11

d. Procedure

Intra-operative care and monitoring of animals.

- i. Each anesthetic case, whether a survival or acute surgery, will have a veterinary technician assigned to exclusively monitor the anesthetized animal.
- ii. Vital signs, as outlined in as in Anesthesia section (7.d.x-xi), will constantly be monitored intra-operatively and will continue to be recorded Form VET1 every ten minutes for the duration of the procedure
- iii. Every 10-15 minutes, during the procedure, the animal will be given a “sigh”. To perform a “sigh,” the rebreathing bag will be filled by Oxygen flush, then approx 3 times the animals’ tidal volume will be introduced into the lungs. This is done to minimize the risk of long-term collapse of lung alveoli, also known as atelectasis.
- iv. The anesthetic regimen will be recorded on Form VET1.
- v. The principal investigator will provide personnel to circulate within the operating room.
- vi. Any vital signs that are found to be outside normal parameters will be reported to the surgeon and the vaporized anesthesia gas will be adjusted or discontinued accordingly. All adjustments will be recorded on both Form VET1 and Animal Medical Record Operative Report (Form VET2). If vaporized anesthesia gas is discontinued flush the circuit as detailed in Anesthesia section (7.d.xx) and administer 100% Oxygen.
- vii. The appropriate measures will be taken to bring the animal into physiologic stability. When, in the opinion of the surgeon, the animal is determined to be stable by vital signs; anesthetic depth will be determined and then returned to stage III plane II and the procedure will continue.

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- viii. The name of the surgeon, any surgical assistants, anesthesiologist, and any other personnel involved directly in the surgical procedure will be recorded on both Forms VET1 and VET2.
- ix. A description of the surgical intervention will be described on Form VET2.
- x. Any and all complications and corrective measures taken will be recorded appropriately on Form VET2.
- xi. In the event of any cardiac event, including but not limited to, changes in rhythm, bradycardia, supraventricular tachycardia, ventricular tachycardia, or fibrillation, the surgeon will be immediately notified and events will be recorded in the complications section of Form VET2. The surgery will be stopped, Isoflurane gas will be discontinued and the circuit flushed as detailed in Anesthesia section (7.d.xx). Corrective action will be taken as detailed in Section 10 Large animal Cardiac Emergency Procedures.
- xii. The end of the surgical procedure will be recorded Form VET1 as the time that the skin sutures are placed.
- xiii. Anesthesia gas will be shut off and the circuit flushed as detailed in Anesthesia section (7.d.xx). This time will be recorded on Form VET1. The dog will be kept on oxygen for a minimum of 10 minutes or until swallowing reflex returns. Prior to this the dog will be untied from the surgical table, the iv catheter will be flushed with heparinized saline and taped in place, one last EKG print out or notation in the record will be made.

e. Laparotomy Closure

The abdominal peritoneum and rectus fasica will be closed with 2-0 PDS in a simple interrupted pattern. (Note the rectus fascia must be incorporated as this is the strength layer. Approximately 1/2 centimeter bites of rectus fascia should be taken). Close the subcutaneous tissue if it is thicker than 2 1/2 cm to prevent dead space. Use 2-0 vicryl in a simple continuous pattern. The subcuticular should be closed with 2-0 vicryl in a simple interrupted pattern or simple continous pattern. Close the skin with simple interrupted pattern of 2-0 nonabsorbable nylon or stainless steel. Stainless steel sutures take some practice to avoid getting them too tight. All skin sutures should be placed apositional and fairly loose. Skin sutures need to be removed in 10-12 days. This will need to be documented.

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10. Large animal Cardiac Emergency Procedures

EMERGENCY	ACTION	DRUG	DOSAGE
BRADYCARDIA HR below 60 bpm	<p>1. Discontinue anesthetic gas and flush circuit with O₂ 2. Notify surgeon 3. Maintain animal on 100% O₂</p> <p>If HR does not recover in 3-5 min or continues to decline administer Atropine IV, followed by a fluid bolus. If there is no IV line, double the dose and dilute the dose with 3-10 mL of sterile saline and administer through ET tube followed by several rapid ventilations.</p>	Atropine 0.54 mg/mL	0.05 mg/kg iv, it
ASYSTOLE	<p>1. Discontinue anesthetic gas and flush circuit with O₂ 2. Notify surgeon 3. Maintain animal on 100% O₂</p> <p>Start cardiac compressions at a rate of 100 compressions per minute (round chested dogs in dorsal, narrow chested dogs in lateral position) Have someone check femoral pulse for effective compressions. Breathe for the dog at 20-30 rpm (1:2 inspiratory to expiratory time). Watch ECG for Rhythm.</p> <p>If no ECG administer Epinephrine IV, followed by fluid bolus. If there is no IV line, double the dose and dilute the dose with 3-10 mL of sterile saline and administer through ET tube followed by several rapid ventilations.</p>	Epinephrine 1:1000	0.01 mg/kg iv, ic, it
VENTRICULAR FIBRILLATION	<p>1. Discontinue anesthetic gas and flush circuit with O₂ 2. Notify surgeon 3. Maintain animal on 100% O₂</p> <p>Initiate or continue CPR. Defibrillate. If unsuccessful double the energy dose and repeat. Administer Lidocaine IV, followed by a fluid bolus. If there is no IV line, double the dose and dilute the dose with 3-10 mL of sterile saline and administer through ET tube followed by several rapid ventilations.</p>	Lidoacine 20 mg/ml	2-4 mg/kg iv, it

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11. Immediate Post-operative Monitoring

a. Purpose

The purpose of this section of the Large animal Surgical Procedures Policy is to describe the steps taken to care for animals post-operatively.

b. Application

This policy applies to all Creighton University faculty, staff, residents, students, and fellows who work in the research surgical area.

c. Associated Policies

Animal Medical Records 7.13

Pain Recognition and Assessment 7.11

d. Procedure

Post operative care and monitoring of animals recovering from surgery.

- i. In survival surgery, the post operative period will begin when the skin sutures are placed.
- ii. At this time, Isoflurane anesthesia gas will be shut off and the breathing circuit will be flushed as detailed in Anesthesia section (7.d.xx). This time will be recorded on Form VET1.
- iii. A temperature, pulse rate, and respiratory rate (TPR) will be checked and recorded on Animal Medical Record Anesthesia Recovery (Form VET3).
- iv. The animal will be allowed to breathe 100% Oxygen and will constantly be monitored. When swallowing reflex returns, the animal will be extubated. A TPR will be checked and recorded and the time of extubation will be noted Form VET3. At this time an Elizabethan or cervical collar is placed to assist in protecting the incision line from excessive manipulation by the animal.
- v. After extubation, the animal will be taken to a post-operative recovery cage. The room will already be warmed to 75° F and the animal will be placed on a fleece pad to help maintain warmth and comfort. A TPR and the time will be checked and recorded.
- vi. The time which the following events occur will be recorded on Form VET3: return of spontaneous respiration; return of swallowing reflex; animal able to lift its head; animal regains sternal recumbency; and when it is able to stand. A TPR will be recorded at the intervals specified in Form VET3. In addition, the animal will be observed for responsiveness, vomiting, stool, urine, excessive drooling with observations recorded in SOAP format (detailed in the Animal Medical Record Policy 7.13).
- vii. Prophylactic analgesics will be administered for 24-48 hours post-operatively. Increased dosages and frequency or addition of other analgesics will be based on pain assessment.

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- viii. All animals will be monitored extensively post-operatively utilizing the Animal Medical Record Post Operative Evaluation/Treatment (Form VET4a and VET4b). Any individual making post-operative evaluations or providing post-operative treatment shall record and initial each entry unless it is all done by the same person. If this is performed by one individual he/she shall initial the Date/time observed section.
- ix. The temperature of the animal should stay above 99°F. If at any time it is cooler the following steps should be taken to warm it up.
- x. Increase the temperature of the recovery room and provide a blanket and/or wrapped hot water bottle.
- xi. If that is ineffective, then IV will be started to administer warm fluids and a space heater will be provided.
- xii. Any animal with an IV fluid line that is able to stand must be monitored to protect the line from being accidentally pulled out.
- xiii. Any action taken to support the animal will be recorded on Form VET3.
- xiv. Immediate post-operative complications, such as but not limited to, respiratory distress, cardiac arrest, hemorrhage, etc., which result in the animal being returned to the operating room and necessary support or action will begin by qualified people who are named on the protocol. The principal investigator will be quickly recalled to the lab.
- xv. Any action taken in such circumstances will be recorded Form VET2.
- xvi. Food and water will continue to be withheld to protect the animal from vomiting or drowning in food and water containers.
- xvii. Monitoring should continue and post operative pain medications and other medications as listed in the protocol should be strictly followed and recorded.

12. Post-operative Days 1-10

a. Purpose

The purpose of this section of the Large animal Surgical Procedures Policy is to describe the steps taken to monitor post-operative health of animals for the first ten days following surgery.

b. Application

This policy applies to all Creighton University faculty, staff, residents, students, and fellows who work in the research surgical area.

c. Associated Policies

Animal Medical Records 7.13

Pain Recognition and Assessment 7.03

d. Procedure

Post-operative evaluation and treatment for post-surgical days 1 through 10.

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- i. The animal will be checked daily at a minimum, or as indicated in the protocol, by the PI or designee and the following information recorded in Form VET4a or VET4b.
- ii. Principal Investigator or Veterinarian instructions. Examples: special diet (hamburger & rice, prescription diet), bandaging, placing Elizabethan collars, etc.
- iii. The following observations (iv – vii) should be made before feeding the animal in the event food is needed to facilitate observations or medication.
- iv. The animals' interest in food and water.
- v. The absence or presence and character of any excretory function.
- vi. TPR will be recorded. If the animal is very active an attempt will be made with food to distract the animal.
- vii. Assessment of pain with a description of all signs of pain observed (if applicable). The appropriate analgesics and other medications will be administered as indicated in the protocol. The drug, dose, route, and time of administration will also be recorded. Note: Unless otherwise specified in approved IACUC protocol, if pain is not alleviated within 15 minutes of pain medication administration then the Principal Investigator and ARF Manager will be notified. ARF personnel will assess the animal and contact the Veterinarian-in-Charge.
- viii. The condition of the surgical site will be observed and documented including signs of incision site integrity and condition (inflammation, color, exudate, bleeding, etc.).
- ix. If there is a surgical dressing, it will be replaced every day and will be noted on Form VET4a and 4b. Any additional comments necessary, with regard to the dressing, will also be recorded on the form.
- x. The individual making the observations shall date/time stamp and initial form VET4a and 4b daily at a minimum.
- xi. ARF Personnel observing any animal experiencing post-surgical complications will immediately notify the Principal Investigator and ARF Manager, who will assess the dog and contact the Veterinarian-in-Charge.

13. Post-surgical care following day 10

a. Purpose

The purpose of this section of the Large animal Surgical Procedures Policy is to describe the steps taken to monitor post-operative health of animals after the tenth day following surgery until completion of the study.

b. Application

This policy applies to all Creighton University faculty, staff, residents, students, and fellows who work in the research surgical area.

Policies and Procedures

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- c. Associated Policies
 - Animal Medical Records 7.13
 - Pain Recognition and Assessment 7.03
- d. Procedure
 - Post-operative care and monitoring of animals being maintained in the animal resource facility after day 10 and continuing until the completion of the study.
 - i. After post operative day 10, if the dog is completely recovered from surgery (incision completely healed, eating normally and acting normal as documented on Form VET4b) the Principal Investigator or designee may check the animal every other day until post-operative day 30. All observation must be recorded on Form MED2. Note: all animals are checked on by ARF personnel at least daily.
 - ii. After post operative day 30, if the dog continues to be physically within normal limits the Principal Investigator or designee may check the animal weekly until the completion of the study, again recording all observations on Form MED2.
 - iii. When checking the animal, the PI's staff shall consult Form MED2 for any notations made by ARF personnel.
 - iv. The general health, TPR, and mood of the animal will be checked and noted on Form MED2, again all entries must be initialed and date/time stamped.
 - v. Appetite and excretory function will be checked.
 - vi. The incision site will be inspected as outlined in Post-operative Days 1-10 section (12.d.viii).
 - vii. Duties pertaining to specific post-operative requirements such as special diet, weight assessment at specified intervals, etc. as outlined in the protocol, will be performed by the PI or designee and recorded on Form MED2.
 - viii. If an animal is subjected to any intermittent procedures as outlined in the protocol, or caused by a course of action taken with regard to any post-operative complications, daily monitoring or more as indicated will resume. All such procedures shall be documented on the appropriate Animal Medical Record Form.

14. Euthanasia

- a. Purpose
 - The purpose of this section of the Large animal Surgical Procedures Policy is to describe the steps taken to carry out euthanasia procedures in research protocols.
- b. Application
 - This policy applies to all Creighton University faculty, staff, residents, students, and fellows qualified to administer and determine the efficacy of the euthanasia procedure.
- c. Associated Policies
 - Animal Medical Records 7.13

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d. Procedure

- Intra-operative or post-operative euthanasia conducted at the completion of the study.
- i. Tattoo numbers will be verified before signing for the animals release from the Animal Resource Facility.
 - ii. The animal will be appropriately fasted according to the procedure to be performed.
 - iii. General anesthesia will be induced, maintained, monitored and recorded as outlined in Section 7 Anesthesia.
 - iv. Euthanasia will be carried out while the animal is still under general anesthesia and on the operating room table.
 - v. The investigator will advise the technician when he/she is ready for the animal to be euthanized.
 - vi. The appropriate dose of Beuthanasia-D (Section 8 Large animal Drugs & Dosages) will be drawn into a syringe and injected as a bolus into the IV line of the animal.
 - vii. The euthanasia solution will be flushed through the IV line by withdrawing 10mL of fluid from the IV line and pushing it as a bolus behind the euthanasia solution.
 - viii. The animal will be checked for spontaneous respiration by watching for the chest to rise and movement of the anesthetic rebreathing bag. A femoral pulse will be checked and the ECG tracing will be evaluated. The chest will be auscultated for heart sounds.
 - ix. Absence of all of the above mentioned signs will be interpreted as clinical death.
 - x. The anesthesia gas and the Oxygen and air flows will then be discontinued and the animal will be disconnected from the anesthesia circuit.
 - xi. On the anesthesia forms, this will be recorded as the “time procedure ended”.
 - xii. All Animal Medical Record forms will be evaluated for completeness and, along with the animals’ cage card, be turned in to the Animal Resource Facility Manager (by the end of the working day following euthanasia) for review by the Veterinarian-in-Charge.

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Appendix 1**CREIGHTON UNIVERSITY****LARGE ANIMAL SURGICAL PROCEDURE COVER PAGE**

PRINCIPAL INVESTIGATOR _____

IACUC PROTOCOL NUMBER _____

- Standard Large animal Surgical Procedure
- Modified Large animal Surgical Procedure

Policies and Procedures

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Date Approved: _____

Appendix 2**EMERGENCY CONTACT NUMBERS**

Personnel	Position	Office #	Pager #	Cell #	Home #
*	ARF Manager				
*	University Veterinarian				

* Contact the IACUC Office for the ARF Manager and the University Veterinarian contact information.

Note: The Principal Investigator on the Protocol is the first person to contact in an emergency, then their Co-Investigators. Otherwise, follow the order of the table above.