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## PERINATAL CARE OF THE DOG

### 1. PURPOSE

- 1.1. The purpose of this Animal Care and Use Procedure (ACUP) is to describe the minimum standards for perinatal dog care. This ACUP is approved by the Cornell Institutional Animal Care and Use Committee (IACUC). Any deviation must be approved by the IACUC prior to its application.

### 2. SCOPE

- 2.1. This ACUP is intended for use by all personnel involved in the perinatal care of dogs used for Cornell Research Protocols.

### 3. INTRODUCTION

- 3.1. The perinatal period refers to approximately the last two weeks of gestation up to weaning of the pups.
- 3.2. A primiparous bitch is a bitch pregnant for the first time, or having given birth to only one litter.
- 3.3. Gestation is 63 days on average (56-72 days) from the first mating.
- 3.4. Contact the Center of Animal Resources and Education (CARE) at Cornell University by emailing [care@cornell.edu](mailto:care@cornell.edu) for more information or for assistance.

### 4. MATERIALS AND EQUIPMENT

- 4.1. Feed (dry and canned)
- 4.2. Vaccines
- 4.3. Whelping box
- 4.4. Drain cover
- 4.5. Heating pad or lamp

## 5. PROCEDURES

**NOTE:** Follow [ACUP 515 Dog Husbandry](#) for routine dog care in addition to specific perinatal guidelines below.

### 5.1. Before Gestation

- 5.1.1. Institute appropriate weight reduction of obese bitches prior to breeding. Do not pursue weight loss during pregnancy.
- 5.1.2. Feed underweight bitches a growth or performance food to rapidly correct their weight condition.
- 5.1.3. Prior to breeding, ensure that the vaccination status of applicable canines is current as per [ACUP 604 Preventative Health Program for Dogs](#).

**NOTE: DO NOT** give modified live vaccinations during pregnancy.

- 5.1.4. Ensure that other components of veterinary care (e.g., dental cleaning, deworming, etc.) are scheduled before gestation / lactation.

### 5.2. Gestation

- 5.2.1. Feed a good-quality maintenance dog food up to day 50 of gestation.
- 5.2.2. Feed bitches *ad lib* unless justified for scientific reasons (and approved by the IACUC) or for medical considerations (and approved by a CARE veterinarian or designee).
- 5.2.3. Feed a diet with a high caloric content at day 50 of gestation and continue to do so until the pups are weaned.
- 5.2.4. Place a whelping box and whelping paper in the pen one week prior to whelping.
- 5.2.5. Assure that the kennel's gutter drain is covered so as to prevent pups from getting stuck in the drain.
- 5.2.6. Place a heat lamp over the whelping box in the corner so that the bitch has a choice of being under it or not.

**NOTE: DO NOT** use a heating pad unless reviewed and approved by a CARE veterinarian.

- 5.2.7. Make sure animals cannot reach the lamp cord and place a safety screen over the bulb.
- 5.2.8. Unplug the heating device prior to using water to clean the kennel surfaces. Make sure the lights are turned back on after each cleaning.

### 5.3. Parturition

- 5.3.1. Observe for signs of parturition (see section 9.1.2).
- 5.3.2. During whelping, change the whelping box papers only if wet; otherwise, do not disturb.
- 5.3.3. Notify the Principal Investigator (PI) when the bitch is whelping and if any problems are seen or dead pups are found.

- 5.3.4. During second stage parturition, the bitch must be examined if:
- 5.3.4.1. She has greenish discharges and no pup is born within 2–4 hours.
  - 5.3.4.2. Fetal fluid was passed more than 2–3 hours previously but nothing more happened.
  - 5.3.4.3. The bitch has had weak irregular straining for more than 2–4 hours.
  - 5.3.4.4. The bitch has strong regular straining for more than 20–30 minutes.
  - 5.3.4.5. More than 2–4 hours have passed since the birth of the last puppy and more remain.
  - 5.3.4.6. The bitch has been in second-stage labor for more than 12 hours.
- 5.3.5. During third stage parturition, the bitch must be examined if:
- 5.3.5.1. All placentas have not been passed within 4–6 hours (although placenta numbers may be difficult to determine because of the bitch eating them).
  - 5.3.5.2. The lochia (post-partum vaginal discharge) is foul smelling.
  - 5.3.5.3. There is continuing severe genital hemorrhage.
  - 5.3.5.4. Rectal temperature is higher than 39.5° C / 103° F.
  - 5.3.5.5. The general condition of the bitch is affected.
  - 5.3.5.6. The general condition of the puppies is affected.

#### 5.4. Early Lactation Through Weaning

- 5.4.1. Ensure all pups are feeding and that the bitch has no signs of mastitis (e.g., redness, heat, abnormal swelling of the mammary tissue, lethargy, fever).
- 5.4.2. Observe the bitch for post-whelping complications (see section 9.1.3.1).
- 5.4.3. Record the total number of pups (alive and dead), their sex and ID number in the bitch's health record and notify the PI immediately.
- 5.4.4. Place dead pups in a plastic container, labeled with the bitch's number, in the designated refrigerator.
- 5.4.5. Remove the bitch and pups from the pen (leaving the pups in the whelping box for the first 2–3 days) and hose down the area as noted above for daily cleaning.
- 5.4.6. Transfer pups to a clean box after 2-3 days.
- 5.4.7. Change papers in the whelping box daily, including the day of whelping.
- 5.4.8. Clean and sanitize the whelping box on as per facility SOPs.
- 5.4.9. Continue to feed the bitch and pups a high caloric food through weaning.
- 5.4.10. At 3-4 weeks of age, start providing the pups with small amounts of growth formula food mixed with warm water. Continue to feed this to the pups until they are weaned from the bitch and known to eat dry food.
- 5.4.11. Feed pups dry food (growth formula) *ad lib*, until 9 months of age or as prescribed by the veterinarian or PI.

## 6. PERSONNEL SAFETY

- 6.1. Medical Emergencies: **CALL 911.**
- 6.2. When working with animals wear appropriate PPE, observe proper hygiene, and be aware of allergy, zoonosis, and injury risks. Refer to the [CARE Occupational Health and Safety webpage](#) for more information.

## 7. ANIMAL RELATED CONTINGENCIES

- 7.1. Post contact information for emergency assistance in a conspicuous location within the animal facility.
- 7.2. Emergency veterinary care is available at all times including after working hours and on weekends and holidays by using the CARE (pager 1-800-349-2456)
- 7.3. Non-emergency veterinary questions & requests for care, email CARE veterinary staff at [care@cornell.edu](mailto:care@cornell.edu).

## 8. REFERENCES

- 8.1. Ettinger, S.J.; Feldman, E.C. *Textbook of Veterinary Internal Medicine*; W.B. Saunders Co: Philadelphia, PA. 2000.
- 8.2. *Kirk's Current Veterinary Therapy XIII, Small Animal Practice*; Gentz, N., Ed.; W.B. Saunders Co: Philadelphia, PA. 2000.
- 8.3. Clinical Theriogenology, *Vet. Clin. N. Am., Small Animal Practice*, Vol. 31. 2001.
- 8.4. Birchard, S.J.; Sherding, R.G. *Saunders Manual of Small Animal Practice*; Elsevier Health: New York, 2000.
- 8.5. ACUP 515 Dog Husbandry:  
[http://ras.research.cornell.edu/care/documents\\_k/ACUPs/ACUP515.pdf](http://ras.research.cornell.edu/care/documents_k/ACUPs/ACUP515.pdf)
- 8.6. ACUP 604 Preventative Health Program for Dogs:  
[http://ras.research.cornell.edu/care/documents\\_k/ACUPs/ACUP604.pdf](http://ras.research.cornell.edu/care/documents_k/ACUPs/ACUP604.pdf)
- 8.7. CARE Occupational Health and Safety webpage:  
<http://ras.research.cornell.edu/care/OHS.html>

## 9. APPENDIX

### 9.1. Perinatal Details

#### 9.1.1. Gestation Notes

- 9.1.1.1. At about three weeks of gestation, the bitch may experience a loss of appetite, with occasional nausea and mild vomiting. Appetite typically will return at about week 4.
- 9.1.1.2. Do not feed vitamins or other supplements unless under the direction of the facility veterinarian and the PI.

#### 9.1.2. Parturition Notes

- 9.1.2.1. Several days before parturition, the bitch may become restless, seek seclusion or become excessively attentive and refuse to eat food. Notify the CARE if the bitch refuses to eat food.
- 9.1.2.2. In primiparous bitches, lactation may be established less than 24 hours before parturition, whereas after several pregnancies, colostrum can be detected as early as 1 week prepartum.
- 9.1.2.3. The bitch may exhibit nesting behavior 12–24 hours before parturition concurrent with increasing frequency and force of uterine contractions.
- 9.1.2.4. A drop in rectal temperature occurs 8–24 hours before parturition.

**9.1.2.5. First Stage of Parturition:**

- 9.1.2.5.1.** Duration: 6–12 hours. May last up to 36 hours in primiparous bitches.
- 9.1.2.5.2.** Vaginal relaxation and dilation of the cervix occur during this stage.
- 9.1.2.5.3.** Intermittent uterine contractions, with no signs of abdominal contractions or straining are present.
- 9.1.2.5.4.** The bitch may appear uncomfortable and the restless behavior may become more intense.
- 9.1.2.5.5.** Panting, tearing up and reorganizing of the bedding, shivering, and occasional vomiting may be seen.
- 9.1.2.5.6.** Some bitches show no behavioral evidence of first-stage labor.

**9.1.2.6. Second Stage of Parturition:**

- 9.1.2.6.1.** Duration is usually 3–12 hours.
- 9.1.2.6.2.** If one or more of these signs have been observed the bitch is in second-stage labor:
  - 9.1.2.6.2.1.** The passing of fetal fluids.
  - 9.1.2.6.2.2.** Visible abdominal straining.
  - 9.1.2.6.2.3.** Rectal temperature returning to normal level.
- 9.1.2.6.3.** At onset of second-stage labor the rectal temperature rises to normal or slightly above normal.
- 9.1.2.6.4.** Expulsive uterine contractions are accompanied by abdominal straining.
- 9.1.2.6.5.** Allantochorionic membranes may rupture and a discharge of clear fluids may be noted.
- 9.1.2.6.6.** The first fetus is usually delivered within 4 hours after onset of second-stage labor.
- 9.1.2.6.7.** Normally, the bitch will break or tear the fetal membrane, lick the neonate intensively and sever the umbilical cord. At times, the bitch will need assistance to open the fetal membrane. The umbilical cord can be clamped with hemostats and cut with blunt scissors, leaving about 1 cm of the cord.
- 9.1.2.6.8.** In normal labor, the bitch may show weak infrequent straining for up to 2-4hours before giving birth to the first pup. If the bitch is showing strong, frequent straining without producing a pup this indicates the presence of an obstruction and veterinary advice must be promptly sought.

**9.1.2.7. Third Stage of Parturition:**

- 9.1.2.7.1.** Expulsion of the placenta and shortening of the uterine horns follows within 15 minutes of the delivery of each fetus.

**9.1.2.7.2.** The bitch should be discouraged from eating more than one or two of the placentas because she may develop diarrhea and vomiting.

**9.1.2.7.3.** Lochia (greenish postpartum discharge of fetal fluids and placental remains) will be seen for up to about 3 weeks.

### **9.1.3. Early Lactation Through Weaning Notes**

**9.1.3.1.** Post-whelping complications include red or abnormally swollen mammary tissue and elevated temperature. Notify CARE if this occurs.

## **10. HISTORY**

<b>Date:</b>	<b>Event:</b>
02 FEB 17	Most Recent Annual Review – Reviewed by: Dr. N. Kollias
18 MAR 16	New Format – Converted by: J. Kirby
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