

Here is a helpful summary you can use to complete your AKC Breeder Education Quiz.  
When you pass your test, AKC will send you an exclusive Breeder Education Certificate.

## STAGES OF PREGNANCY

### Stage 1: Preparatory

- Averages about 6 to 12 hours but can last as long as 36 hrs
- Signs:
  - Restless, nervous and becomes clingy to owner
  - Nesting
  - Refusal of food
  - Temperature will drop to 98°-99° 12-24 hours prior to stage 2
    - Occurs in 80% of bitches
    - Related to drop in progesterone levels
- Uterine contractions will start to organize but may not be visible to owner
- Cervix will start to dilate

### Stage 2: Active Labor

- A puppy is delivered every 30-60 minutes on average; although 2 hours can be normal for some as they take a break between deliveries
- Length of Stage 2 can be dependent on size of litter
  - 6-12 hours on average
  - Up to 24 hours for larger litters
- Abdominal contractions are strong and regular
  - Temporary pause in panting
  - Lift tail
  - Grunt

### Stage 2: Placenta Delivery

- Placenta is delivered 5-15 minutes after the puppy is born
- Delivery from 2 horns of the uterus, the order of puppy to placenta delivery may alternate:
  - For example, if a bitch delivers from the left horn and then a puppy from the right, delivery process may happen in different manners:
    - Puppy → Placenta → Puppy → Placenta
    - Puppy → Puppy → Placenta → Placenta

### Stress Effects during Stage 1

- Stress can affect labor progression:
  - Premature labor
  - Smaller puppies
  - Interfere with bitches ability to relax
- Create a low-stress environment:
  - Set up whelping area in a quiet/calm, warm, draft-free place
  - Have the bitch acclimated to whelping area well in advance
  - Keep the number of people involved limited
  - Keep in mind what is best for your bitch; each may have different needs

### Delivery of Puppies in Stage 2

1. Ferguson Reflex, a strong uterine contraction, begins as the puppy enters birth canal
  2. Chorioallantoic sac presents as puppy enters the vulva
  3. Puppy follows (sometimes with amniotic sac and sometimes without)
- 60% puppies are head first; 40% hind legs/tail first
  - The mother will tear amniotic sac and start licking puppy vigorously to clear nose and mouth to stimulate respiration

### Breeder Involvement during Stage 2

Not all bitches are great mothers and may need assistance:

- Removal of the sac and fetal membranes, clearing airways to stimulate breathing and clamping/tying/disinfecting the umbilical cord



**DYSTOCIA** is a medical emergency that puts the life of the puppies and the bitch at risk:

- Black or green vulvar discharge prior the delivery of the first puppy (after the first puppy, discharge is normal)
- Strong contractions (grunting and lifting tail) lasting for more than 20/30 minutes without delivery of a pup
- More than two-three hours elapsing between puppies with or without contractions or goes as long as 4 hours between puppies
- If puppy appears to be stuck in birth canal

## WHEN/HOW TO PREP FOR EMERGENCIES

- Seek advice when labor is not progressing normally
- Breeders should plan ahead of time since these emergencies can happen after regular clinic hours/at night
- Keep all clinic information available as well as 24-hour emergency clinic

## PREDICTIVE DYSTOCIA FACTORS

Physiologic issues in the mother

- Physical obstructions like vaginal stricture restricting the passage of the puppy
- Abnormalities in uterine function, effecting contractions
- Abnormalities in pregnancy, twist or torsion of the uterus

Issues with the puppy

- Large puppy that cannot pass through birth canal
- Abnormality in the puppy, including one that has accumulated too much water (walrus puppy)
- Abnormality in the presentation of the puppy; folded or turned which causes issues with birth canal entry

## VETERINARIAN EVALUATION DURING DYSTOCIA

Veterinarian will assess the overall health and stability of the bitch

- Blood work for metabolic complications
  - Low blood calcium or low blood sugar (in severe cases Negative Energy Balance Pregnancy Ketosis)
- Vaginal Exam: potential puppy lodged in birth canal
- X-Rays to determine number of puppies retained in uterus
- Ultrasound to check fetal heart rate and ways to safely intervene



## NON SURGICAL INTERVENTION

- Determine if due date is correct to avoid delivering prematurely: canine gestation is 63 days (+/- a day)
- During active labor, malposition puppies can be repositioned by experienced veterinarians during vaginal exams
- Medical therapies:
  - Oxytocin and/or Calcium therapy to stimulate contractions but be sure that there are no obstructions in birth canal before applying these therapies to avoid discomfort to bitch, harm to puppies or risk of serious damage like uterine rupture

## CANINE CESAREAN SECTION PREP

- Performed by highly skilled veterinarian team
  - Pre-anesthetic evaluation
    - Physical exam
    - Blood work
  - Intravenous catheter placed
    - Anesthesia drugs
    - Pain medications
    - Fluids during surgery
  - Prep externally as much as possible to minimize bitch's time under anesthesia
    - Clip hair on abdomen
  - Anesthesia options may include epidural or general anesthesia

## CANINE CESAREAN SECTION SURGERY STEPS

1. Veterinarians will administer a sterilized scrub to incision area
2. Incision is made in the mid to lower abdomen to exteriorize the uterus
3. A very small incision is made directly on the uterus in order to remove the puppies
  - In canines the uterus has a small short body and two very long horns where the puppies reside
  - In large litters, more than one incision may be required
4. Once a puppy is removed, it is passed to skilled technician team
  - Clear puppy airways to stimulate breathing
  - Clamp, tie, disinfect umbilical cord
  - Warm and dry puppy
  - Place in a warm, humidified incubator
  - Placentas are typically removed along with puppies but if difficult to remove or excessive bleeding, may deliver vaginally along with discharge
5. Uterine incision is sutured
6. Uterus is then placed back into the abdomen and inspected to make sure puppies delivered successfully, no abnormalities and no bleeding
7. Abdominal incision is sutured in several layers
8. When all done and bitch is recovered, puppies are encouraged to nurse to start the maternal/puppy bonding process





## POST PARTUM CARE

### Neonatal Care

- Once warm and dry, puppies should be actively seeking out nipple to nurse with strong rooting reflex
- Mucus membranes/gums may appear bright red (rather than pink) which is normal and indicative of the extra hemoglobin in their blood the first few days after birth
- Puppies should have tone to body and not feel limp
- Should vocalize when handled
- Newborn puppies are significantly less mature than other species; first 3 weeks is the most critical

### How to treat Unresponsive Puppies

- Fluid aspiration from the nose and mouth of the newborn
  - Be gentle
  - Avoid using a high powered suction vacuum to prevent injury
  - Bulb syringe or Delee Mucus Trap can be used to gently suction and remove mucus plugs restricting airways
- CPR
  - Apply to newborns not thriving or breathing readily
  - 1st clear airways
    - Keep in mind physiology of neonatal puppies
    - Susceptible to low oxygen (Hypoxia) caused by immature respiratory control mechanisms
    - Respiratory pattern is lower and more irregular than adult dogs
  - Respiratory reflexes in areas by umbilical cord and genitals are stimulated by mother's licking
  - Pressure point under the nose to stimulate breathing
  - Low heart rate is commonly due to poor ventilation and low body temperature
  - Veterinarians often work on a puppy for 30-45 minutes before discontinuing

### PHASES OF NEONATAL PUPPIES (BIRTH – 6 WEEKS)

- Perinatal: first day following birth
- Neonatal: day 2 – 3 weeks
- Maturation: 3 – 4 weeks
- Pre-weaning period: 4 – 6 weeks

### Weaning: typically 6-8 weeks

- Follow mother's lead and consider the following:
  - What is the mother's health
  - Weight
  - Energy
  - Nipple health: Mastitis
  - Size of litter
  - Willingness to have puppies nurse; puppy teeth can cause discomfort

### Birth to 3 Weeks

- Birth weight is strong predictor of survival; Weigh 2x a day for the first week of life
- Neonates have a lower body temperature than adult dogs; 96°- 98° during first week of life
- Neonates aren't able to regulate body temperature until week 3 when reflexes to shiver develop

### 3 Weeks

- Eyelids begin to open
- Ear canals open
- Regulate temperature
- Able to eat solid foods
- Able to urinate and defecate without stimulation

