# Puppy Management and Post-partum health issues in the bitch

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# Introduction to managing puppies

Puppies delivered by Cesarian section often require stimulation to start breathing. Revival procedures include:

- Brisk rubbing
- Aspiration of mouth and nostrils
- Supplemental oxygen (mask)
- 1-2 drops dextrose
- 1-2 drops Antisedan® (atipamezole)
- Naloxone® (0.1-0.2 ml/kg IV)
- Epinephrine (0.1-0.3 mg/kg IV or IO)
- Acupuncture (GV26, needle 27 g)
- Keep warm
- Keep going up to 30 minutes

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**Figure 6.** The JenChung GV26 acupuncture point used

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**Figure 5.** Suction of fluid from mouth and pharynx can be

# Critical neonatal concerns

**Initial health check:**

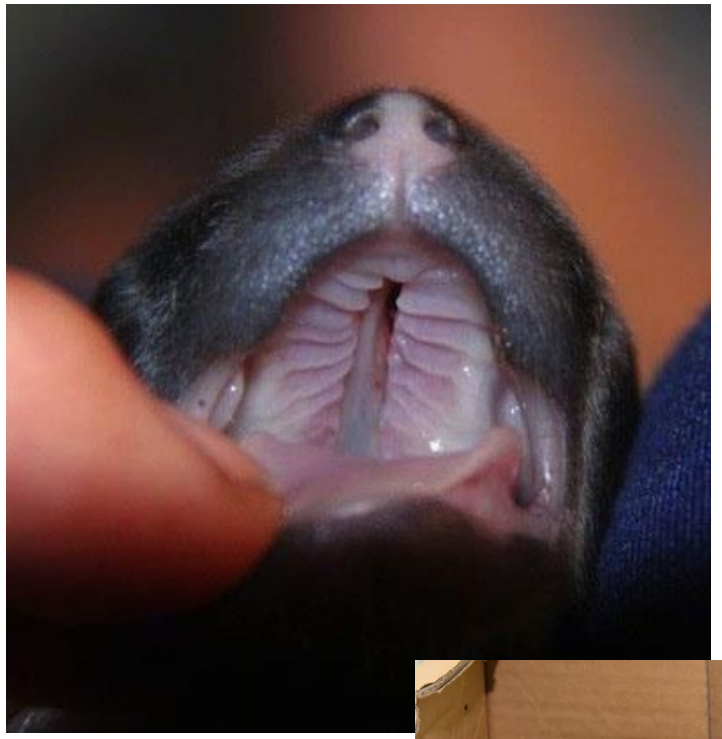
- Congenital defects (e.g., cleft pallet)
- Normal reflexes (sucking, pressing, righting)

**Normal behavior:**

- Nurse q 2-4 hours
- Crawl, sucking, distress vocalization
- Bitch stimulates urination and defecation

**Key concerns:**

- Prevent hypothermia (thermoregulation begins at about 6-8 days)
- Prevent dehydration (newborns require 13-22 ml/100 g body weight/day)



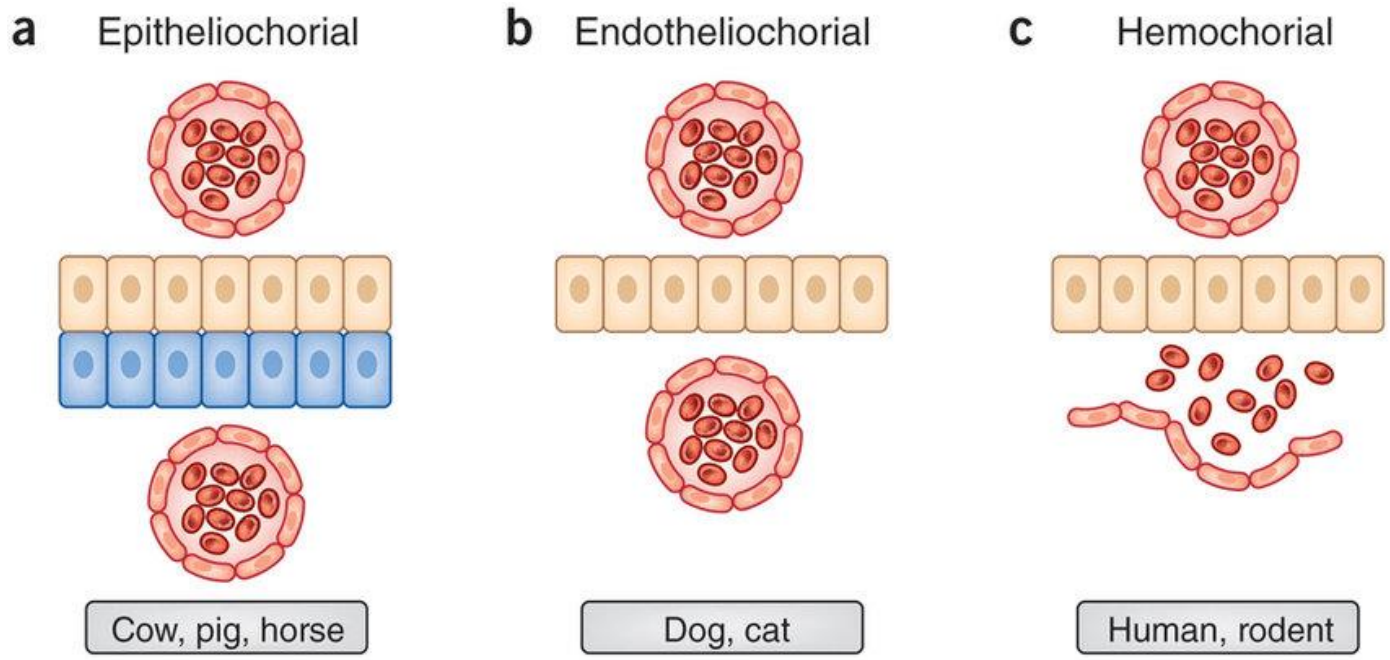
# Critical neonatal concerns (continued)

Placentation in the bitch does not allow transfer of maternal antibodies, so passive immunity from ingestion of colostrum in the first 24 hours is critical.

Colostrum is rich in IgG and IgA antibodies that persist for 6-16 weeks in the puppies, which may interfere with vaccine immune response.

Failure of passive transfer from colostrum may be treated by giving plasma from the bitch:

- Several drops orally q 2 hours
- up to 3-5 ml/pound body weight over first 24 hours



# Supplementary nutrition

**Puppies may need to be fostered or hand fed if:**

- The bitch dies
- She rejects the litter
- She is very aggressive toward the puppies
- Insufficient milk production/agalactia
  - ➢ True agalactia (rare, neurogenic inhibition of prolactin secretion; possible infection)
  - ➢ Temporary agalactia (early C-section; tx with metoclopramide 0.1-0.2 mg/kg SC q 6-8 hrs); encourage sucking from puppies
  - ➢ Inhibition of milk letdown (pain or stress response; 2-5 IU oxytocin q 6 hrs; diazepam may help very nervous bitches)
- Mastitis (may or may not be able to have the puppies on her)

# Hand feeding puppies

**Tube feeding:**

- #5-8 French rubber catheter
- Measure from nose to last rib, mark and use ¾ of the length

**Bottle feeding:**

- Human baby bottle with natural nipple
- Check hole size (invert and squeeze bottle)

**What to feed:**

- Use commercial puppy milk replacer or home-made recipe. Avoid cow's milk (diarrhea)

**How much to feed:**

- 1st week 12-13 ml/100g/day, ÷, q 2 hrs
- 2nd week 14 ml/100g/day, ÷, q 2 hrs
- 3rd week 18 ml/100g/day, ÷, q 2-4 hrs
- At 3-4 weeks start soft gruel mixture of puppy food and water 50/50

# Hand feeding puppies (continued)


**Key concerns with hand feeding puppies:**

Must weigh them at least once a day and record, to confirm that they are growing

Take temperatures for the first few days after birth prior to feeding (minimum 35.6° C)

Must stimulate urination and defecation

**Common pitfalls:**

- Overfeeding → diarrhea
- Underfeeding → dehydration

# Home-made milk replacer

1¼ cup of canned evaporated milk or (preferably) whole goat's milk (not cow)

85 ml cooled boiled water

1 raw egg yolk

225 ml plain yogurt (not skim or fat free)

½ teaspoon karo syrup or corn syrup (not honey); can substitute 225 g white sugar dissolved in 60 ml hot water

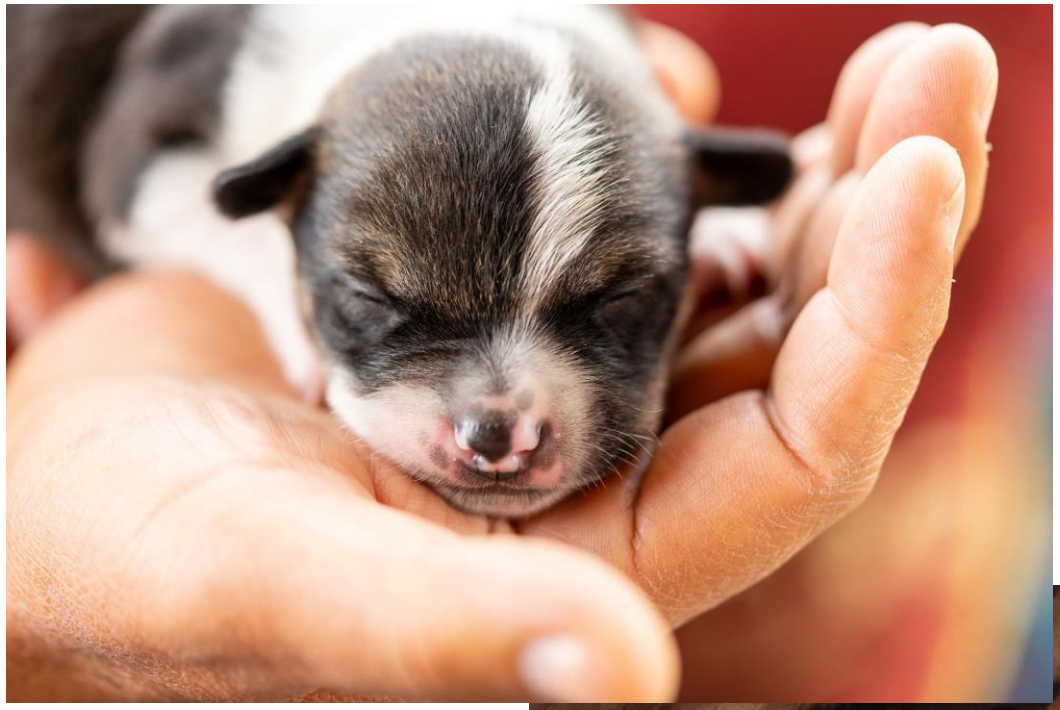
Blend with a wire whisk or gently in blender (no bubbles)

Keep cool and discard after 7 days

Warm amount being fed to body temperature (38° C)

Be sure mixture will drip out of nipple hole if bottle feeding (right thickness)


# Fading puppy syndrome



**Clinical signs in fading puppies:**

Anorexia

Weight loss/emaciation

Lethargy

Hypothermia

Death

**Two types of fading puppies:**

- Type 1: small at birth, weak, possible birth defects, dehydrated, anorexic → weight loss and lethargy → death
- Type 2: normal at birth and 1st week, then depressed, dehydrated, anorexic, etc.

# Fading puppy syndrome (continued)

**Diagnosis:**

**The puppies:**

- Clinical exam/history
- Lab results (CBC, UA, serum chemistry)

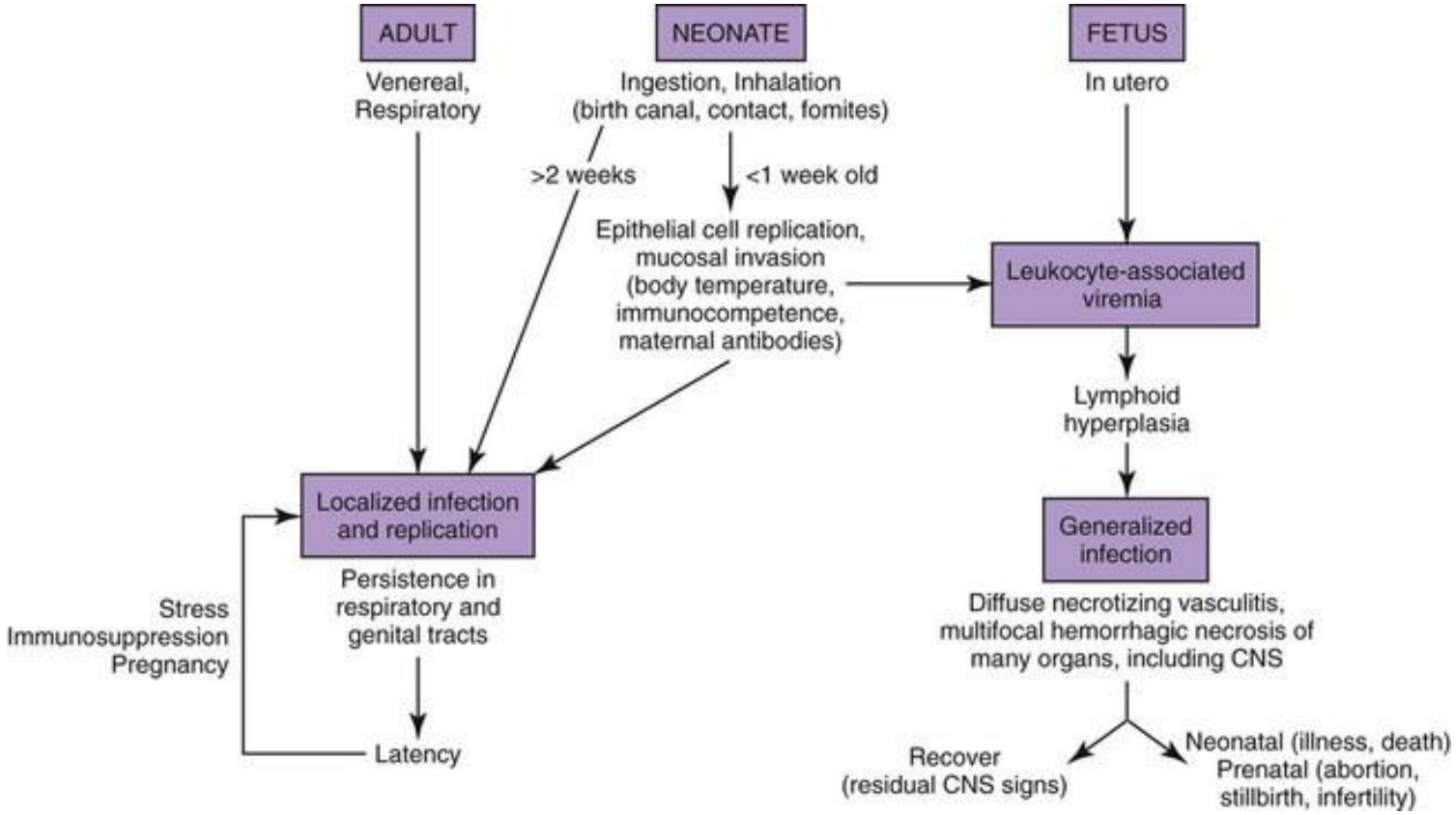
**The bitch:**

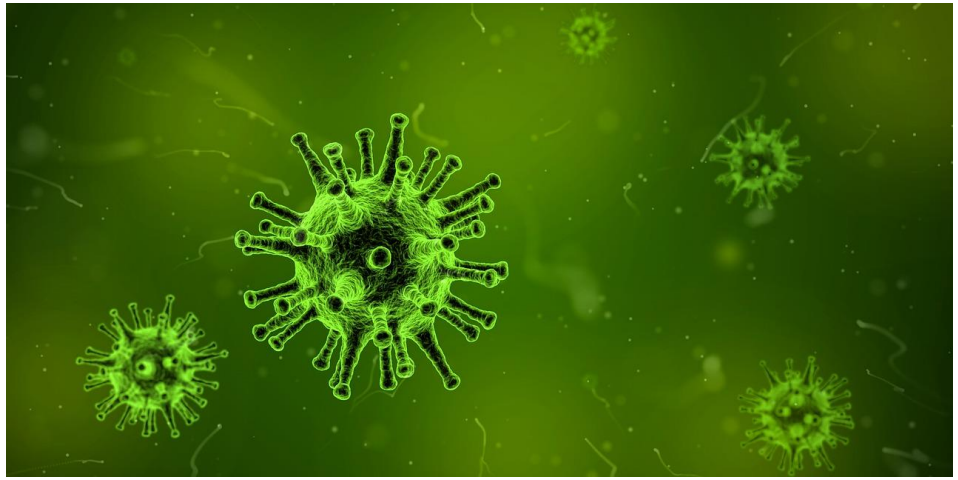
- Clinical exam/history
- Vaccination status (type and timing)
- *Brucellosis*, herpes virus, etc. (dog show exposure?)
- Diet change, supplements
- Trauma

**Treat what you see:**

- Hypothermia → warm slowly
- Hypoglycemia (< 30 mg/dl) → dextrose IV or IO)
- Dehydration → 3-4 ml/kg/hour, avoid overload

Can be difficult to manage. Considerations include potential reduced GI absorption, slow GI transit time, increased mucous in stomach, abnormal GI pH



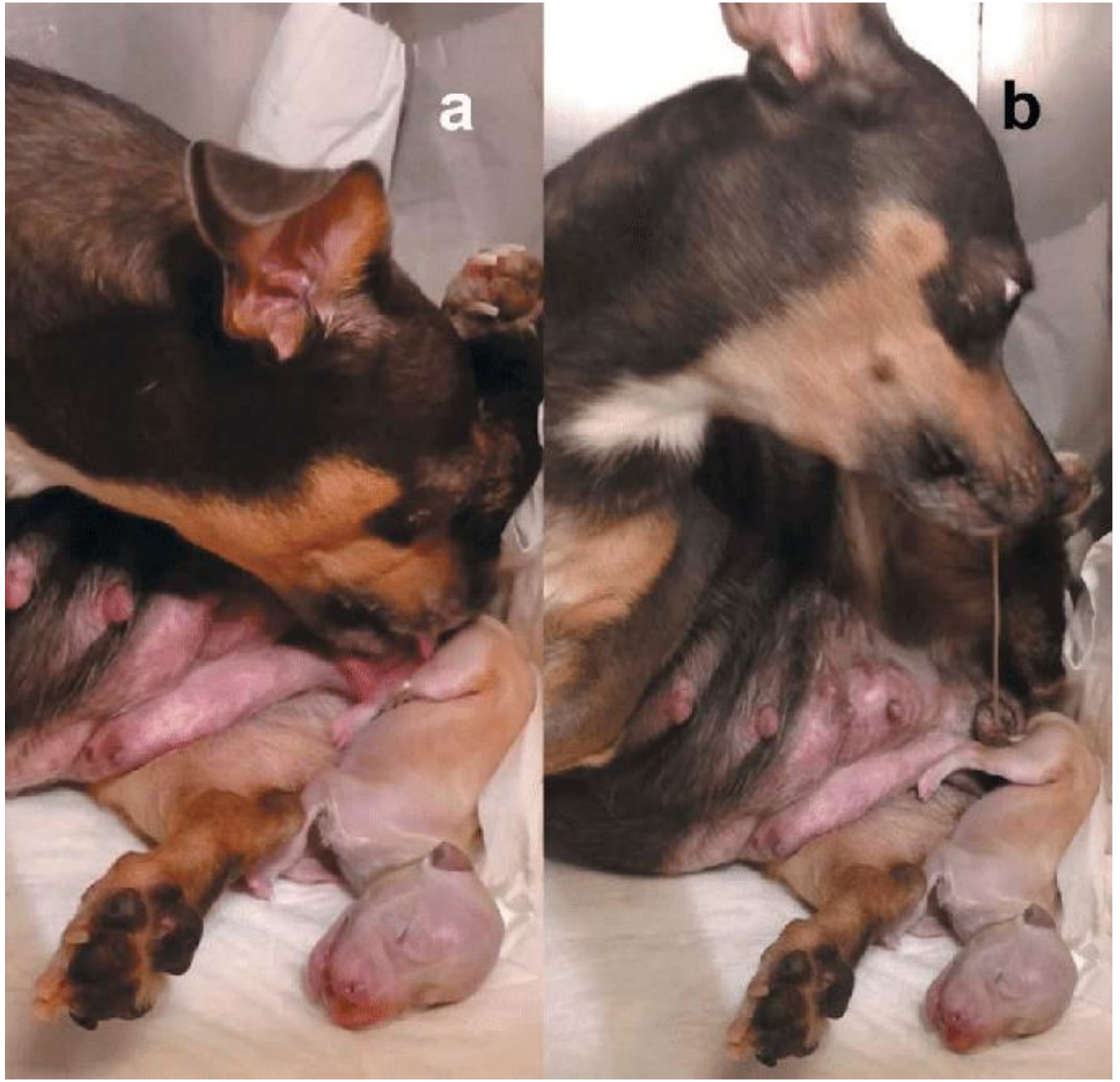
# Post-partum issues in the bitch

**General health concerns post-partum:**

- Hypotension
- Hypoglycemia
- Hypocalcemia
- Exhaustion
- Abnormal vaginal discharge (normal to have serosanguinous discharge for 5-6 weeks)

**Maternal behavior is determined by:**

- Hormones (oxytocin, progesterone, estrogen, prolactin)
- Previous experience
- Stimulus from the puppies (pheromones)



# Post-partum issues in the bitch (continued)

**Maternal behavior (continued)**

Normal bonding occurs in less than 24 hours

**Bad mothering/failure of bonding:**

- Characteristic of some breeds
- Close emotional attachment to owner
- Post-caesarean section (keep placentas)
- Post-partum pain
- Hypocalcemia
- Nervous disposition or inexperience (may try acepromazine 0.01-0.02 mg/kg)

# Uterine disorders

## Retained placenta or fetus

**Clinical signs:**

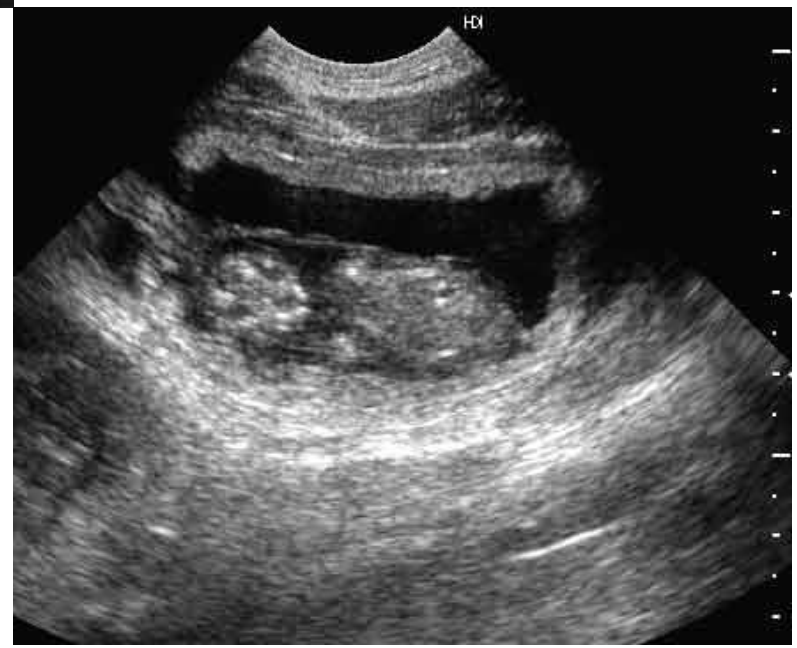
- Thick dark or green vaginal discharge
- Restless, not nursing well
- More common in toy breeds
- If not treated → anorexia, fever, depression, septicemia, toxemia, death

**Diagnosis:**

- Ultrasound
- Endoscope
- Palpation (can be misleading)

**Treatment:**

- IV fluids ± shock treatment
- Broad spectrum antibiotics (amoxicillin, clavamox, cephalosporins)
- If within 24 hours of whelping → repeated doses of oxytocin (1-5 IU/dog SC or IM q 6-12 hours, up to 3 days)
- Careful “milking”
- Forceps
- Ovariohysterectomy



# Uterine disorders (continued)

**Metritis**

**Clinical signs:**

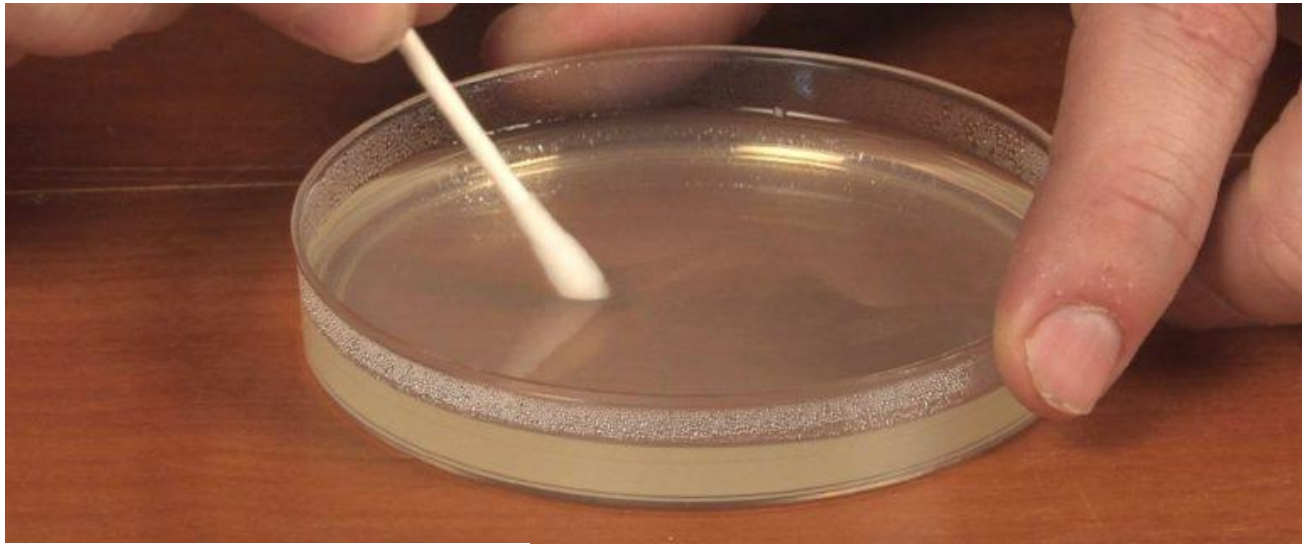
- Lethargy, anorexia, poor mothering, ↓ milk
- Fever, depression, malodorous discharge
- Septicemia, toxemia, death

**Diagnosis:**

- Clinical signs
- Vaginal swab (guarded swab, aerobic and anaerobic culture)
- *Escherichia coli* most common pathogen

**Treatment:**

- IV fluids with electrolytes, ± shock treatment
- Broad spectrum antibiotics
- Uterine evacuation (prostaglandin F2α 0.10-0.20 mg/kg q 12-24 hours for 3-5 days)
- Ergotamine (0.02-0.2 mg/kg IM one time; with caution, may cause uterine rupture/closed cervix
- Ovariohysterectomy




# Uterine disorders (continued)

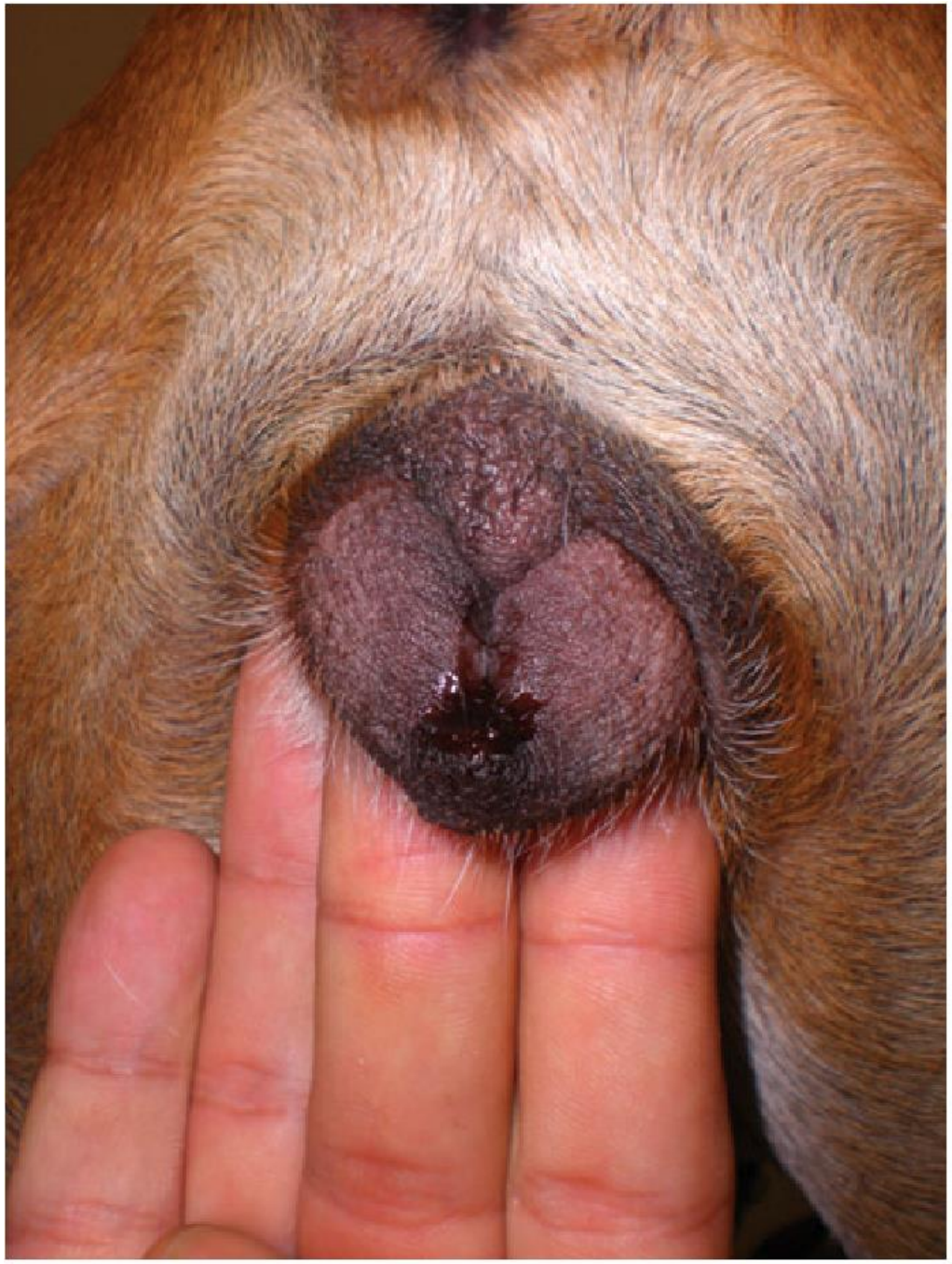
**Subinvolution of placental sites (SIPS)**

**Clinical signs:**

- Persistence of serosanguinous, hemorrhagic vulval discharge post-partum; resembles normal estrus-related discharge
- Normal blood work
- Not clinically ill
- Cause unknown

**Treatment:**

- Ovariohysterectomy
- Focal involution of uterine wall at former placental attachment sites



# Mammary gland disorders

**Mastitis**

Inflammation with or without infection of one or more mammary glands

Can occur post-partum or if pseudo-pregnant

**Clinical manifestations of mastitis:**

- Acute → usually caudal gland(s), swollen, hot, reddened, painful, ± fever, lethargic; secretion brownish, purulent or hemorrhagic; possible death of puppies from toxic milk syndrome
- Gangrenous → often progression of severe acute mastitis; abscesses and necrosis of gland(s), glands darkened, cold and/or ulcerated, signs of septicemia/toxemia
- Chronic/subclinical → very limited information regarding incidence and significance; suspect when puppies are not gaining weight and/or increase in neonatal mortality


# Mammary gland disorders
# Mastitis (continued)

**Diagnosis:**

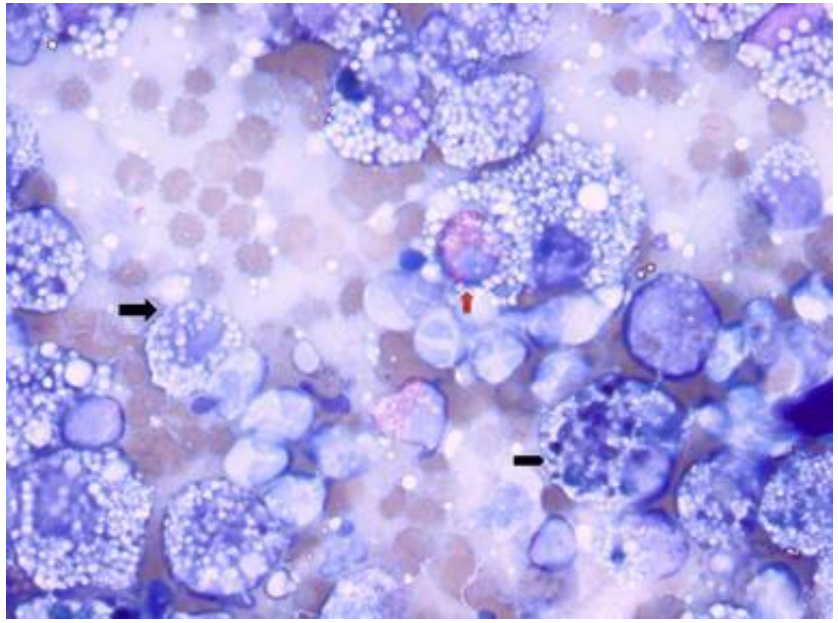
- CBC → neutrophilic leucocytosis (acute)
- Milk cytology → large numbers of degenerate neutrophils (> 3000/µl) with ingested bacteria and macrophages
- Culture

**Treatment of acute mastitis:**

- Milk pH determines antibiotic choice (pH < 7.3 → trimethoprim/sulfadiazine 15-30 mg/kg IO q 12 hours; erythromycin 10 mg/kg IO q 8 hours; lincomycin 15 mg/kg IO q 8 hours) (pH > 7.4 → ampicillin 20 mg/kg IM q 8 hours; cefalexin 30 mg/kg IO q 12 hours)
- IV fluids; analgesics
- Hot packing of affected gland(s)
- Strip affected gland(s)
- Removal of puppies is controversial → may continue natural feeding except where gland is abscessed or gangrenous

**Treatment of gangrenous mastitis:**

- Appropriate antibiotics, IV fluids, analgesics
- Surgical drainage
- Potential mastectomy



# Questions?