

Iams Canine Pediatric Care Symposium



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Neonatal and Puppy Intensive Care

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INTRODUCTION

Neonatal emergency care is difficult as the newborn puppy has physiological differences, needs, and challenges much different than the adult canine. Newborn puppies do not have a gag reflex, cannot shiver to maintain their body temperature, and have normal body temperatures 5 to 6°F below those of older individuals. The following information can assist the veterinarian and breeder/client to recognize and respond to life-threatening conditions in the neonatal patient and puppy.



CONDITIONS, PROCEDURES, AND TREATMENT

Cardiac Arrest. Intra-cardiac epinephrine, closed heart massage, and oxygen.

Bradycardia. A newborn's normal heart rate should be >200 bpm. Atropine sulfate sublingual or intra-cardiac will increase the heart rate.

Apnea. Sublingual dopram, stimulating with a 27g needle at the Jen Chung acupuncture site or dilating the rectum with a thermometer can be used to stimulate breathing.

Hypothermia. A neonate's temperature is normally 96–97°F. Below 94°F, gut stasis occurs and feeding should not be attempted until a normal temperature has been achieved. Hyperthermia (>100°F) is as damaging as hypothermia. Neonatal temperatures should be monitored as many breeders tend to over supplement heat.

FLUID/DRUG THERAPY

1. **Sublingual.** This absorption is very rapid in the neonate. Dopram, glucose, etc. can be given in this manner.
2. **Oral.** If the body temperature is normal, gastric intubation can be used to administer nutrients, glucose or drugs. Many ill individuals do not have normal body temperatures, which limits oral dosing.
3. **Subcutaneous.** In minimally ill puppies, subcutaneous fluids and medication can be administered. In more severely ill puppies, peripheral vascular collapse occurs and the subcutaneous route may be detrimental rather than advantageous.
4. **Interosseous.** Any medication that can be given intravenously can be given intraosseously. A spinal needle of the appropriate size is inserted at the intertrochanteric fossa of the femur and threaded into the medullary cavity. Products given intraosseously should be warmed pre-administration and given slowly.
5. **Intravenous.** The jugular vein can be used for catheter placement and medication administered.

LABORATORY ANALYSIS

Samples can be obtained using the jugular vein. Puppies should be hand held or laid on towels. Never place a neonate or puppy on cold surfaces due to the tendency to become hypothermic.

Lab Test	Normal Values	
Packed Cell Volume (PCV)	32–37%	
BUN	5 mg/dl	<ul style="list-style-type: none">• BUN is low compared to adults due to the neonatal small liver mass• Any neonatal BUN testing in the adult range of normal should be evaluated for kidney dysfunction
Glucose	80–125 mg/dl	
T. Protein	3.5–4.5 gm/dl	

DEHYDRATION

Due to the lack of dermal fat, skin turgor cannot be used for evaluation of neonatal dehydration. All newborn puppies will “tent.” Better methods of accessing dehydration in a neonate is checking gingival moisture using one’s finger. If the finger “sticks” to the gum, dehydration is a concern. Checking urine color is also helpful.

Normal urine should be very dilute and be the color of lemonade. If the urine is the color of lemon peel, the puppy should be evaluated and treated for dehydration.

DRUG THERAPY

Puppies metabolize drugs differently than adults. Reduced stomach emptying, increased intestinal absorption, reduced drug metabolism, lack of blood-brain barrier all contribute.

Drugs given to neonates should be given at the recommended dose per kg, but only administered half as often as recommended (ie, s.i.d rather than b.i.d).

Antibiotics should be based on blood or urine culturing. Puppies are very prone to septicemia and aggressive action is required as soon as problems are encountered, (ie, weight loss, labored breathing, blood in urine).

Topical medications are very quickly absorbed through the neonatal skin, often resulting in extremely high systemic doses. Topical medication should be used with care in the neonate.

FEEDING

Puppies should only be fed when their body temperature is above 94°F. Nursing or bottle feeding is preferred as the amount can be controlled by the puppy’s appetite.

Gastric intubation is performed to supply nutrients to puppies unable to nurse. The goal is to return the puppy to

nursing as soon as possible.

The stomach tube is measured each time used, from the tip of the nose to the umbilicus. The puppy is allowed to “swallow” the tube. The tube should pass easily to the marked point.

A bitch milk replacement product should be used as the source of the nutrition. A one pound puppy should be given approximately 15ml/feeding and a total daily intake of approximately 90–120ml. Smaller amounts should be given initially. The puppy temperature should be monitored before each feeding and urination and bowel movements stimulated with a warm moistened cloth or cotton ball.



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QUESTIONS & ANSWERS

The following questions from dog breeders were addressed by Dr. Hutchison at The Iams Company Breeders Symposium held at the AKC/Eukanuba National Championship in Long Beach, California, December 2, 2003. These reflect common concerns voiced by both novice and experienced breeders.

Q: Please provide suggestions on bottle feeding. Should we always be terrified of aspiration?

A: You do not want to use pet nurser bottles (the ones you have to poke the holes in); these are not made for puppies and you should be terrified of aspiration if you use these. If you do need to bottle feed, the best thing to use is an Evenflo® angled bottle because puppies are used to nursing on their belly. Use a nipple designed for premature babies as it will be easier for the puppies to adapt.

Warm the milk replacer to normal body temperature, around 95–96°F. Puppies like sweet things so if they are a little reluctant to take the bottle, use just a little bit of corn syrup or honey on the nipple. Try to keep them on their belly, have the milk replacer at body temperature, use a nipple of a size they can handle, and you should not have to worry about aspiration problems.

Q: *Do you see a slower growth rate or development in premature pups; ie, pups taken by C-section before the due date because of off-color vaginal discharge?*

A: Puppies that are taken early because there are signs of placental separation or other problems in the bitch do not necessarily grow at a slower rate. However, because the puppies' livers may not be producing blood clotting elements, we may have to supplement them with vitamin K. Premature puppies' lungs are very immature and sometimes we will use a product called dexamethasone to stimulate surfactant production in the lungs. Surfactant stops the lungs from sticking together.

Premature puppies are indeed a challenge, and we do everything we can to avoid premature delivery. But in certain situations if there is a chance that they will not survive if we leave them in the uterus, I prefer to have them in my hands and take my chances.

Q: *Is there anything we can do to help toy puppies under two ounces?*

A: The most important thing you can do for tiny puppies weighing less than two ounces is to make sure they are getting adequate nutrition. Their stomachs hold such a small amount, they almost have to be fed or nourished hourly. We try to maintain their body temperature because they have very little insulation. A little artificial heat is necessary, but be careful not to over-heat them. A puppy is 80% water; if you get them too warm they "evaporate". A newborn puppy's temperature should be 96–97°F regardless of size. Weigh them twice a day on an accurate electronic scale to be sure that they are gaining weight. Some biochemical or liver problems can occur in the little puppies because the liver mass is so small. Raising them is a challenge, but it can be done successfully.

Q: *Any tips for performing at-home puppy CPR? What can we do to "get the puppy going"?*

A: If the puppy's respiratory tract is clear of fluids, been rubbed and stimulated, has a heart beat, but the puppy just won't breathe — take a small hypodermic needle (25 gauge) and insert it at the same place you would push underneath your own nose to stop a sneeze. By twisting the needle in, an acupuncture point is stimulated and causes the puppy to start breathing. If there is no heart beat, we do closed-chest massage, similar to the human CPR procedure.

In some situations, manual stimulation is not enough and we turn to drugs. Having a product such as Dopram® on hand at home is helpful. Check with your veterinarian about providing you with a supply if you are expecting a litter. Placing a drop or two under the puppy's tongue will stimulate respiration. In a hospital situation where a puppy's heart rate is very slow or stopped, we will administer other drugs that would not be available in a home environment.

Q: *I have a tiny, hyperactive puppy that is a strong nurs-er, but can't take the time! I've used sugar water for two or three days, and later goat's milk and yogurt. Is this alright?*

A: For tiny puppies or puppies that won't nurse, it's okay to give them sugar water. Sugar water, however, has no nutrients other than glucose. We actually worry about the glucose getting too high in little puppies. Since they don't have a blood-brain barrier, glucose can cause brain swelling and actually kill them. I usually recommend getting them on the bitch or a milk replacer. Goat's milk is high in sugar, but is still better than using pure sugar water. The key idea here is to maintain the nutrients and calories, and hope as they get bigger and stronger that they're able to start nursing normally. It is important for any puppy that is being raised on a bottle to get back to nursing on the bitch, if she's available, as soon as possible.

Q: *How much frozen colostrum should be given to a newborn? Do you freeze in zip lock bags or plastic bottles?*

A: Depending on the size of the puppy, try to determine how much volume the stomach holds. The stomach of a one-pound puppy usually holds up to 20cc (or 20ml). Give about 5–7cc of colostrum and repeat it one or two times. We actually freeze it in small screw-top vials; that way we only thaw as much as we need and don't have to keep refreezing the colostrum. If kept frozen, colostrum will keep for about a year.

Q: *How stressful to puppies is removal of dew claws? When should the procedure be done? Is there risk associated? Is it uncommon to lose a puppy after the procedure?*

A: Removal of dew claws causes minimal stress to puppies. We usually perform the procedure at day three. Since this takes place after the colostrum can be absorbed, we are not jeopardizing the puppy's protection and immune system. Occasionally we'll get a little infection in the removal site. It is extremely uncommon to lose a puppy after dew claw removal.

Q: *What is your opinion on what causes water puppies?*

A: Water puppies (walrus puppies) or anasarcosis, is a genetic disease. We see this condition in English Bulldogs, Clumber Spaniels and Yorkies, as well as a few other breeds. This condition is usually due to some type of a heart defect affecting the circulation.