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First 48 hours

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The first 2 days of life are challenging for newborns, which have to succeed in many physiological adaptations from intra- to extrauterine life: finding oxygen and nutrients on their own are difficult but crucial steps for survival. These first 2 days of life are especially critical, and account for 35% of all neonatal deaths (0–21 days). Clinical examination and follow-up over these 2 risky days is based on a limited number of criteria (Figure 1), evaluating intrauterine growth (birthweight), cardiorespiratory function (APGAR) and energy provision (glycaemia, rectal temperature). Thresholds above which the risk of neonatal mortality is increased are defined by breed. Roughly, the 25% lightest puppies (within a given breed) require a specific nursing. The quality of passive immune transfer, usually assessed in large animals through IgG blood concentration, is more easily evaluated in puppies indirectly through growth rate over the first 2 days of life.

Day	Observation to be performed	Situation causing increased risk of neonatal mortality
BIRTH	Maternal behaviour (takes care of newborns or not)	Absence
	Presence of colostrum	Absence
	Congenital abnormality	Presence
	Birthweight	<breed-specific threshold
	Efficient suckling	Absence
	APGAR score	<6
DAY 1	Glycaemia	<5.1 mmol/l (< 92 mg/dl)
	Rectal temperature	<35°C
DAY 2	Glycaemia	<5.1 mmol/l (<92 mg/dl)
	Rectal temperature	<35°C
	Growth rate 0–2 days	<0 (did not get weight from birth)

Figure 1: Clinical examination of puppies in the first 2 days of life

Around 40% of puppies suffer from an energy and/or immune deficit over the first 2 days of life. In cases of negative growth rate over the first 2 days of life, risk of neonatal mortality increases seven-fold. Whereas a deficit in energy can easily be compensated, immune deficit cannot: the intestinal barrier is closed as early as 12 hours after birth. If the absence/insufficiency of dam colostrum can be anticipated, passive immune transfer can be obtained using frozen/thawed colostrum (but not effectively by oral administration of canine serum). Colostrum provides not only energy and IgG, but also IgA and a great variety of antibacterial substances (ensuring intraluminal local intestinal protection), together with hormones and growth factors, responsible for gut development and maturation. Even after intestinal barrier closure, colostrum ingestion is beneficial for puppies' health.

KEY LEARNING OBJECTIVES

- Learning the criteria determining the health status of a puppy within the first 2 days of life
- Knowing the critical thresholds (in numbers) indicating that specific nursing is required
- Learning specific nursing procedures to be implemented in case critical thresholds are reached

MULTIPLE CHOICE QUESTIONS

1. What is the critical threshold for glycaemia of the puppy at 2 days of age?
 - (A) 8.3 mmol/l
 - (B) 5 mmol/l
 - (C) 2.5 mmol/l
 - (D) 1.1 mmol/l
2. When is the intestinal barrier closed in puppies?
 - (A) 12 hours after birth
 - (B) 24 hours after birth
 - (C) 48 hours after birth
 - (D) 72 hours after birth
3. Which of the following statements about neonatal mortality risk is correct?
 - (A) Does not increase if the weight of the puppy decreases by 10% between birth and the age of 2 days
 - (B) Increases if the weight of the puppy is not higher than the birthweight
 - (C) Does not increase if the APGAR score within the first 8 hours of life is below 6
 - (D) APGAR score is predictive of survival only if performed within the first 10 minutes of life as in humans