

# Puppy Development: Maternal Stress

Croney Research Group



## Maternal Stress


The physiological response of stress during and after gestation (pregnancy) has short- and long-term implications for many body systems of both the dam and puppies

A black and white dog is lying on a dark, textured surface. Several small black and white puppies are huddled around the dog's belly, nursing. The dog's fur is long and shaggy. The puppies are also long-haired and have black patches on their white fur.

## Causes of Maternal Stress

May include:

- Poor physical health
- Inadequate nutrition
- Unpredictable environment
- Unpredictable caretakers



## Impact of Maternal Stress on Dams

- Reduced welfare
- Enhanced adrenocortical response (e.g., stress response)
- Changes in neuroendocrine functioning (e.g., hormonal imbalance) may alter maternal care

# Impact of Maternal Stress on Puppies

- Increased morbidity
- Decreased birth weight
- Lowered immune functioning
- Impacted brain neurotransmitter systems (e.g., neurological abnormalities, emotional regulation)
- Altered hypothalamic–pituitary–adrenocortical axis functioning (e.g., stress response)



## Impact of Maternal Stress on Puppies

- Reduced welfare
- Increased risk for behavior problems
- Altered cognitive abilities



## Learn More:

- [At-a-Glance Development Application](#)
- [At-a-Glance Developmental Stages](#)
- [At-a-Glance Development: Maternal Care](#)
- [At-a-Glance Developmental: ENS](#)



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