

A small, fluffy white puppy is sitting on a dark, textured rock. The puppy has large, dark eyes and a black nose. The background is a soft-focus green field of grass and foliage, with sunlight filtering through, creating a warm, natural setting.

# Puppy Development: Early Neurological Stimulation (ENS)

Croney Research Group

# What is ENS?

- Brief exposure of very young (neonatal) puppies to mild stressors for short periods
- Is thought to improve their response to stress later in life
- May be as simple as picking puppies up and petting them from head to tail before returning them to the mother and litter





## How Does ENS Work?

Theory 1: Exposure to **mild stressors** “trains” the HPA (hypothalamic-pituitary-adrenal) axis, altering how the individual responds to stress later in life

Theory 2: **Maternal care** upon return to the nest changes alters how the individual responds to stress later in life

**Learn More:**

[At-a-Glance Development: Maternal Care](#)



## Inconclusive Research Findings

- Original studies were conducted using rodent models (not dogs)
- Studies in dogs have reported mixed results leading to uncertainty in our understanding of ENS



# When to Provide ENS?

- Begin at 3 days of age
- Continue for at least 10 days
- Once a day
- A few seconds per each exposure

**Learn More:**

[At-a-Glance Development: Stages](#)

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# Examples of ENS Stressors

- Different positions
- Gentle touches
- Cool temperatures

Note:

More research is needed to identify specific protocol parameters (e.g., length of exposure, total exposures, type of exposure)



A black and tan puppy is sleeping on a light-colored concrete surface. The puppy's head is resting on the ground, and its eyes are closed. The background is a blurred concrete wall.

## A Critical Note on ENS

\*\* Take extreme care  
in the **delivery** and  
**timing** of ENS in order  
to avoid over-stressing  
that can be harmful \*\*

## Potential Benefits of ENS

- Decreased fear
- Decreased stress with handling and restraint
- Enhanced learning
- Stress resistance
- Improved emotional development





# Who Benefits from ENS?

ENS may be particularly  
beneficial to puppies  
with otherwise limited  
early tactile stimulation



## Learn More:

- [At-a-Glance Development Application](#)
- [At-a-Glance Developmental Stages](#)
- [At-a-Glance Development: Maternal Stress](#)
- [At-a-Glance Development: Maternal Care](#)
- [Early Neurological Stimulation \(ENS\): Implications for canine welfare and management](#)
- [Implications of weaning age for dog welfare](#)



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