

CONSULT THE EXPERT

DEVELOPMENTAL STAGES OF PUPPIES

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Many dog owners have certain expectations regarding the behavioral traits of an ideal canine companion. Most prefer their dog to be friendly, affectionate, and responsive.¹ When these behavioral expectations are not met or undesirable behaviors occur, the risk for a dog being relinquished or euthanized increases.^{2,3} The human–animal bond may weaken as owners wait for puppies to “outgrow” undesirable behaviors.



The veterinary healthcare team plays an important role in ensuring puppies mature into well-behaved dogs. With an understanding of normal development, clinicians can be a primary source for providing appropriate guidance to owners during the 4 developmental stages of dogs to help prevent undesirable behaviors.

The 4 Developmental Stages

Behavioral development is integrated with physical maturation and development of the nervous system. Puppy development is divided into 4 stages: neonatal, transitional, socialization, and juvenile.⁴ However, these stages are not rigidly fixed; different breeds may develop at different rates,⁵ and environmental factors can affect genetic expression. Prenatal conditions (eg, diet and health of the dam) can influence puppy development. Research in other species has shown that the offspring of mothers subjected to stressful handling are more sensitive to stressors.^{6,7} However, these 4 periods continue to be useful reference points for discussions of puppy development.

Neonatal Stage

The neonatal stage ranges from birth to ≈2 weeks of age; eyes are not yet open, and ear canals are closed, so puppies experience the world mainly through touch and olfaction.^{8,9}

Despite an immature nervous system, neonates respond to their environment. In a study, puppies that received more maternal care during this period scored higher for social and physical engagement as adults than those raised by less attentive mothers.¹⁰ In another study, puppies gently handled by humans starting at 3 days of age were calmer and more confident at 8 weeks of age as compared with controls.¹¹ Foster families and breeders should be advised to introduce soft handling of puppies as early as possible.

Transitional Stage

The transitional stage lasts ≈7 days (range, ≈14-21 days of age).^{8,12} Eyes and ears begin to function, and muscle coordination improves. Social commu-

nication (eg, growling) and interactions (eg, play) are first observed during this period. Puppies become more aware of their environment and are able to eliminate without maternal stimulation. Because puppies can move further from the nesting area, this is an ideal time to introduce an appropriate elimination substrate.

Socialization Stage

Socialization refers to the process of developing appropriate social behaviors toward conspecifics. In practice, “socialization” is applied more broadly to include the development of social behaviors toward any species and the process of adjustment to relevant environmental stimuli.

A sensitive period is considered a phase in which external stimuli are particularly likely to have a long-term effect on development. Preferences are acquired more readily during this period.¹³ The sensitive period of socialization in puppies begins at 3 weeks of age and lasts until 12 to 14 weeks of age.^{8,9,12} Puppies that have not been socialized during this time have a tendency to react fearfully to novel humans or situations.⁴

Controlled exposure to humans during the socialization period is crucial. Even small amounts of handling can result in beneficial effects. In one study, puppies not handled until 7 weeks of age were more hesitant to approach humans than were puppies handled at 3 to 5 weeks of age.¹⁴ Puppies not handled until 14 weeks of age remained persistently fearful and resistant to handling.¹⁴

Negative experiences during the sensitive period can also have a profound impact on behavioral development. Abrupt weaning, particularly when paired with sudden separation from littermates, may have long-term consequences on behavior. Puppies removed from the dam and litter prior to 6 weeks of age have been shown to be more fearful and have exhibited more undesirable behaviors as adults as compared with puppies that remain with the litter through 8 weeks of age.^{15,16}

Juvenile Stage

The juvenile stage represents the time from the end of the socialization period to sexual maturity. Sexual behavior is generally observed at ≈ 6 months of age, although it may be delayed in large and giant breeds.⁹

Dogs remain behaviorally immature even after they have reached sexual maturity. Large-breed dogs may not mature socially until they are 18 months of age or older.⁸ Because behavior problems are frequently reported during this period, adolescent behavioral well-care visits should be encouraged.

Designing a Socialization Program

It is never too early to start socializing a puppy, and, as long as the puppy remains calm and not fearful, it is never too late to begin. The owner's goals should be considered when customizing a socialization program, and stimuli relevant to their puppy's future should be introduced.

Healthy puppies of any age can begin to visit new places at least twice a week. Owners should take care to avoid locations frequented by dogs of unknown health and vaccination status. The puppy should be allowed to explore at its own comfortable pace. Bringing treats and toys can make the experience more pleasant, but if the puppy becomes too frightened to play or take a snack, the session should be ended.

The puppy should be introduced to a variety of humans, beginning with quiet adults. Children that are old enough to be quiet and gentle with dogs should then be introduced. Puppies can be carefully socialized with healthy puppies and adult dogs that are known to be gentle with puppies.

For some puppies, even mild stimuli may seem overwhelming. The socialization plan for these puppies should be modified accordingly. If fear is profound or persistent, a more in-depth behavioral

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THE 4 DEVELOPMENTAL STAGES



NEONATAL STAGE

The neonatal stage ranges from birth to ≈ 2 weeks of age.

TRANSITIONAL STAGE

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SOCIALIZATION STAGE

The sensitive period of socialization in puppies begins at 3 weeks of age and lasts until 12 to 14 weeks of age.^{8,9,12}

JUVENILE STAGE

The juvenile stage represents the time from the end of the socialization period to sexual maturity. Sexual behavior is generally observed at ≈ 6 months of age, although it may be delayed in large and giant breeds.⁹

treatment plan should be discussed with the owner, and referral to a boarded veterinary behaviorist is never premature. Repeated exposure in the face of profound fear can lead to sensitization and may not be reversible.

Puppy Socialization Classes

Puppy socialization classes are an opportunity for puppies to learn how to behave calmly around humans and dogs. Puppies that attend socialization classes are less likely to be rehomed than puppies that do not attend similar classes.¹⁷

POLL

Do you offer puppy socialization classes at your clinic?

- A. Yes
- B. No
- C. Not yet, but we are planning to in the future.

Scan the QR code to submit your answer and see the other responses! The poll is located at the bottom of the article.



Using QR codes from your mobile device is easy and quick!

Simply focus your phone's camera on the QR code as if taking a picture (but don't click!). A notification banner will pop up at the top of your screen; tap the banner to view the linked content.

A survey-based study found that the risk for a puppy contracting canine parvovirus at a socialization class is low.¹⁸

It is important to be aware that puppies do not complete vaccinations until they are 12 to 16 weeks of age. However, a survey-based study found that the risk for a puppy contracting canine parvovirus at a socialization class is low,¹⁸ and inadequate behavioral inoculation may result in rehoming. Evaluating enrollment requirements for local puppy classes may be beneficial in minimizing this risk. An instructor who requires initial vaccinations and veterinary health certificates is ideal. The classes should be well-run so that puppies are not overwhelmed or frightened.

The First Veterinary Visit History

A brief behavioral history should be obtained for all puppies. Owners should be asked about any concerns they are experiencing with their puppy. Handouts should be provided to pet owners to help them manage normal but undesirable behaviors (eg, mouthing, house soiling, destructive behavior, barking). Such behaviors typically do not resolve on their own and may often escalate if owners attempt inappropriate techniques based on their own research.

Physical & Behavioral Examination

Puppies are usually presented for initial examinations while in their sensitive period for socialization. Positive and negative experiences have a profound impact on future behavior. Puppies that experience positive veterinary visits are more likely to become cooperative patients that can receive good healthcare for years to come.

Both physical and behavioral observations should be included in the patient's medical record. Normal puppies will explore the room and relax during the physical examination,¹⁹ whereas fearful puppies need special attention to assure a positive experience; some may require behavioral therapy.

Behavior Monitoring

Clinicians should follow up with owners to ensure they remain committed to providing excellent socialization opportunities for their puppy. As

puppies mature, new behavioral concerns often develop. A plan should be developed to provide behavioral check-ups every 4 to 6 months until social maturity is reached.

Conclusion

Clinicians are in a unique position to positively affect the social development of puppies. Early, accurate behavioral advice increases the strength of the bond between the owner and the puppy,

improves the puppy's ability to accept excellent medical care, and helps create a strong clinician-owner-patient relationship. ■

RELATED ARTICLE

For a related article, please see [*Developmental Stages of Kittens*](#) on page 30.

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Suggested Reading

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