

The Facts About Modern Electronic Training Devices

Today's technology is surprisingly subtle, more effective

Both radio-controlled and behavior-activated electronic devices have been recognized as effective and humane training equipment when used properly and in accordance with humane principles.¹

No comparable techniques or tools currently available can match the efficacy and safety of the e-collar for establishing safe and reliable off-leash control. If minimizing the intensity, duration, and frequency of aversive stimulation during training is recognized as a significant factor in the definition of humane dog training, then the radio-controlled e-collar must be ranked as one of the most humane dog-training tools currently available.²

Electronic training is most effective when it is used to enhance basic modules and routines previously shaped by means of conventional reward-based training.³

Electronic canine training devices have existed for over thirty years. The misconceptions and apprehension surrounding their use is rapidly dissipating through new, improved technological developments and case studies which examine their performance and safety. The technological advances implemented in this new generation of electronic training devices developed at an astonishing rate, and the result is a more reliable, versatile product. Persons outside the electronic training device industry may not be aware of recent advances, or the uses of electronic training devices.

This white paper was created to provide the latest information for a thorough understanding of the effectiveness and application range of today's generation of electronic training devices. The use of electronic training devices is one of many different options available for a wide variety of behavior modification issues. This paper does not explore alternative options, but focuses on the value that can be achieved by properly using electronic training devices to correct undesirable behavior or modify behavior in general. Sales of electronic training devices continue to grow steadily, as new models are demanded and accepted by consumers who make educated decisions, and who report positive results.

Relinquishing pets to shelters because of behavioral problems is a growing crisis across the nation. "...death from behavior problems is the leading cause of pet mortality," according to Nicholas Dodman, Director of the Animal Behavior Clinic at Tufts University School of Veterinary Medicine and author of the books *The Dog Who Loved Too Much* and *The Cat Who Cried for Help*.⁴

According to Public Broadcasting Service's *Nova Online* — *Animal Hospital*, "Many of the pets brought to shelters are surrendered there because of behavior problems that their owners believe to be permanent. Approximately 70 percent of these animals end up being "put to sleep," making death

from behavior problems the leading cause of pet mortality, ahead of trauma and disease. It is estimated that between five and 10 million dogs and cats come to an untimely end in the nation's shelters and pounds each year—a veritable holocaust. To put these figures into perspective, at least three times as many dogs are destroyed annually because of behavior problems as die of cancer, another leading cause of death. With dogs and cats, the problems range from aggression and house soiling to fear and anxiety-based conditions, including various compulsive behaviors.”⁵ It is our intent to explain why the use of modern electronic training devices can be beneficial in reducing behavioral issues that may cause relinquishing of pets to shelters and how they can be used to improve the human-pet bond.

In the 30+ years since the first “shock collars” became widely available in the United States, these increasingly popular behavioral training devices have been refined to produce more effective results in a proven humane manner, easily adaptable for each pet. While the technology behind modern electronic training devices has come a long way, a few veterinarians and consumers continue to harbor misconceptions about these products and their effect on dogs, based upon their impressions of first-generation devices which were manufactured using outdated technologies and from misleading information from other sources. To the contrary, recent clinical studies offer conclusive evidence that the proper use of modern electronic training devices does not lead to adverse physiological or behavioral effects on dogs. Today's advanced electronic training devices offer improved reliability, versatility and safety features that are state-of-the-art, and result in technology that is responsive to behavioral issues—a factor which can enhance the pet ownership experience, strengthening the bond between pets and their human companions.

This paper presents case studies, conclusions and informed opinions on the risks versus benefits of electrical training devices. Findings are presented from researchers at the Tuskegee University College of Veterinary Medicine,

international canine behavior experts, practicing veterinarians, animal welfare organizations, professional dog trainers, sport dog enthusiasts and persons who have tested and observed the effects of electronic training devices on dogs in shelters and laboratories, in the field and in other real-world settings.

This literature illustrates that a wide range of credible experts believe that the average dog owner with basic knowledge of training techniques can effectively and humanely use electronic training devices for behavioral modification, obedience training and containment needs.

Myths About Electronic Training Devices

“We recognize that older products were often unreliable and difficult to use humanely. But we feel that new technology employed by responsible manufacturers has led to products that can be and are being used safely and effectively to preserve the safety and well-being of many dogs and strengthen the bond with their human companions.”⁶

Veterinarians and Technicians are concerned about the overall well-being of their patients and they understand that many pet behavioral issues are directly attributable to the alarming rise in shelter populations and euthanasia statistics. Veterinary professionals are in a unique, credible position to proactively educate dog owners about behavioral health, thus it is necessary for them to be aware of the latest tools that dog owners may employ to help their pets succeed as valued, permanent family members. In many cases, electronic training devices enable the owner to resolve even the most severe or challenging behavior problems, thus reducing the dog's likelihood of relinquishment to a shelter, or abandonment.

This paper will dispel many myths about electronic training devices, including assertions that:

- They make dogs aggressive

Or, conversely:

- The devices work only on aggressive dogs
- They “shock” the dog
- Electronic collars can cause burns (see “Suggested

Additional Reading” for websites that help dispel this myth)

- Dog owners must be expert trainers to use the devices

Uses for Electronic Training Devices

A review of current literature from canine behaviorists, psychologists, and veterinary researchers suggests that many behavioral problems other than aggression, fears and anxiety-related behaviors may be addressed by the appropriate use of electronic training devices. Since each dog is different, just as no two people are alike, it is recommended that in many cases a combination of training methods may be employed for optimal success. It may also be discovered that electronic training devices are not ideal to correct certain behavior issues. No dog training method provides a blanket solution for all behavior issues.

Origin, Evolution and Popularity of Modern Electronic Training Devices

U.S. pet owners purchased more than 2 million remote training devices, pet containment systems and bark collars in 2006.⁷

Electronic training devices are known by many monikers—most notably and most graphically incorrect as “shock collars.” Other terms include “electronic collars,” “e-collars,” and also “remote trainers,” when used in a generic sense. The preferable and more accurate term “electronic training device” recognizes that while the products do incorporate a degree of electrical or more accurately “static” stimulation, the term “shock” is a misnomer for today’s technology. “First, at low levels, the term shock is hardly fitting to describe the effects produced by electronic training collars, since there is virtually no effect beyond a pulsing tingling or tickling sensation on the surface of the skin. Second, the word shock is loaded with biased connotations ...third, the e-stimulus or signal generated by most modern devices is highly controlled and presented to produce a specific set of behavioral and motivational responses to it.”⁸

The distinctions between first-generation products and today’s devices will be explored throughout this paper.

The first electronic training devices were used by outdoors enthusiasts to train their hunting dogs. When the products proved effective and popular with sport dog owners, leading manufacturers expanded their product lines and reduced the cost to make the devices accessible to companion dog owners. Today there are at least eight major manufacturers of electronic training devices marketing their products globally at retail outlets, through mail order catalogues, and online.

As the benefits to owners and pets have become more widely known, sales of electronic training devices have grown steadily from approximately 200,000 units in 1996 to more than 2 million units today. Unit sales of electronic training devices are projected to reach 5 million annually by 2014 —indicating acceptance of and satisfactory results achieved by a rapidly growing number of consumers worldwide.⁹

Types of Electronic Training Devices

Although the types of electronic training devices vary by function, they are similar in the fundamental delivery of the static stimulation. Modern electronic training devices deliver a low-energy electrical stimulation through contact points attached to a dog collar. Training devices are generally broken down into three classes, each with its own intended use:

Pet containment systems offer a method to confine a dog within an outdoor area, while removing the necessity of constructing a physical barrier. These systems may be installed in-ground for aesthetics as a stand-alone solution, or above ground as reinforcement for an existing barrier that the dog does not respect. In addition to recent wireless models, there are also systems designed for indoor use that can be scaled from small areas (two-foot circle) to larger spaces (twenty-foot circle). Today’s pet containment systems are far more sophisticated than ever before, and offer a variety of features designed to provide a trusted resource for pet containment needs.

Bark control collars are used to curb excessive or nuisance barking by delivering an automatic stimulation from the collar. While these collars come in electronic, spray and sonic varieties, this paper addresses electronic stimulation bark control collars only.

Training collars or “remote trainers” allow the handler to train the dog at close range or at a distance, even when the dog is off-lead or otherwise out of immediate reach. Electronic remote training devices consist of a collar with a receiving unit, and a remote hand-held transmitter carried by the user. When the appropriate button is pressed on the hand-held transmitter, the collared dog receives a warning tone or stimulation (electronic, vibration, etc.). In addition to being useful for deterring undesired behaviors, remote trainers have also proven highly effective for reinforcing the teaching of obedience and other commands.

As with all training protocols or products, we recommend a thorough physical examination and consultation with a veterinarian to determine any health or temperament problems that could be treated with medical care, prior to any training or attempt to change an undesirable behavior.

Veterinarian Survey on Electronic Training

A survey of veterinarians and veterinarian technicians attending the 2003 North American Veterinary Conference found a generally positive attitude about the use of electronic training devices, with **80% of veterinary professionals** stating that they would recommend them in many cases.¹⁰

What about the other 20 percent? Of those who would not recommend the devices in most cases, their primary concerns were:

- Could owner misuse of the product result in adverse physical and/or psychological effects?
- Might the dog be subjected to undue discomfort?

The following research project provides reassurance to veterinary professionals who have concerns about potentially adverse effects of modern electronic training devices.

Case 1 – Tuskegee University Study Finds No Lingering Adverse Effects of Bark Collars

Pet behavior problems are a key contributor to the rising animal shelter population, thus research was conducted in shelter and rescue environments to gauge the effectiveness of electronic training devices.

In 2003 a team led by Janet Steiss, D.V.M., PhD, Tuskegee University College of Veterinary Medicine, conducted a four-week study of adult shelter dogs’ physiological and behavioral responses to bark control collars.

Dogs were randomly assigned to either an electronic collar, a spray collar, or the control group.

At the conclusion of the study, Dr. Steiss and her team concluded that electronic bark collars were not only effective in controlling excessive barking, but that they also did not cause any lingering adverse physiological effects.¹¹

From a behavioral standpoint, the amount of barking was significantly reduced starting on the second day that dogs wore the electronic collars. Physiologically, the dogs registered a mild yet statistically significant increase in blood cortisol level (an indicator of stress) only on the first day of wearing the collars (as compared to the Control Group.)

Table 1: Summary of Salivary Cortisol Concentrations (mean ± SD, nmol/L) for Dogs in Bark Collar Study

Samples were taken 20 minutes after the collar was removed, on week 4, day 3, the last day of the study.

	Week 4, day 3 (6th day wearing active collar)
Control collar (n = 4)	2.04 ± 1.61
Electronic collar (n = 3)	1.56 ± 0

Notes:

- Values were reported as µg/dl and converted to nmol/L (conversion factor: x 27.59)
- No blood contamination of the saliva samples was found on the blood detection kit (transferring < 0.08 mg/dl)
- Salivary cortisol standard curve extends from 0.008 to 1.6 µg/dl.

- Samples taken from 2 non-racing Greyhounds housed in the Small Animal Clinic, Tuskegee University, had values of 1.65 and 1.38 nmol/L.

Source: Janet Steiss, D.V.M., PhD, PT, et al.

Case 2 – Knox County Tennessee Animal Control Study, January 2007

Dave Head, Director of Animal Control for Knox County, Tennessee (population 400,000+), conducted a 24-month period of qualified research to measure the impact of bark control collars on dogs in the survey area. 457 bark collars were made available to pet owners during the study. At the conclusion of the trial period, complaints to the Animal Control office to report barking dogs had diminished from a norm of 25 per day to 1-2 calls per day. In addition, the Animal Control office reported a 5% decrease in dogs running at-large, and the reduction in barking dog complaints increased regular officer productivity. Knox County continues to offer bark collars in an ongoing study effort. Knox County is one of over 500 Animal Control Organizations and Shelters in the United States who were provided Bark Collars at no cost, in an effort to solve nuisance barking complaints.¹²

What Electronic Training Devices Are and Are Not

What makes today's electronic training devices more humane than their predecessors? Advanced technology enables the manufacture of devices that emit a very mild electrical stimulation at lower levels. Many new devices offer a range of variable stimulation that can accommodate factors including pet size, activity level, temperament, etc. These devices draw their static stimulation from batteries in the collar; the energy level they produce is very limited, and comparable to the static stimulation received upon touching a metal object after walking across carpet. It is uncomfortable, surprising, and one quickly draws away; but it is not harmful and is more startling than painful.

Case 3 – Researcher Finds No Evidence of Organic Damage from Electronic Training Devices

In researching the potential for danger associated with using electronic devices to train and/or contain dogs, German researcher Dieter Klein concluded that, “Modern devices using single electric impulses with a duration of less than 1 millisecond, and a height of 30-80 milli-amps...are in a range in which normally no organic damage is being inflicted.”¹³

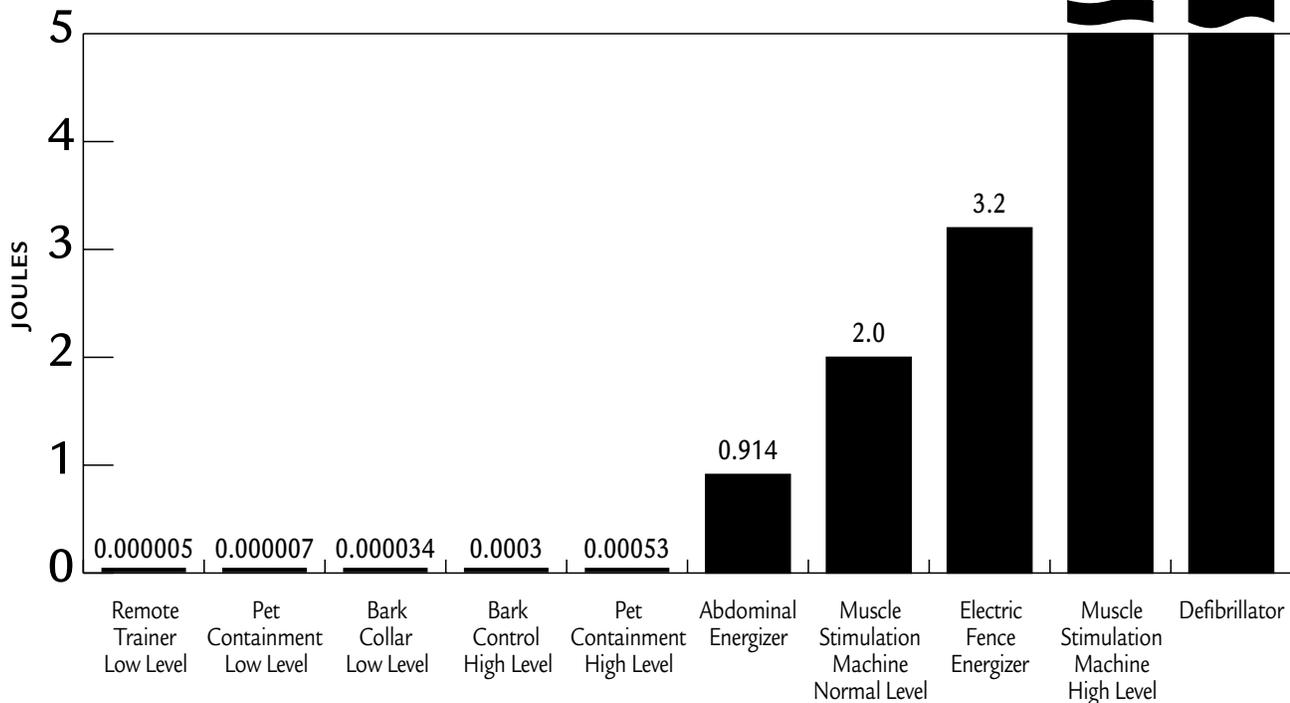
Case 4 – What Does a Static Stimulation Really Feel Like?

The table below helps to put into human perspective the relative sensation a dog experiences when receiving stimulation from various electronic training devices. Note that at .914 joules, the electric muscle stimulation and contractions* a human receives from an “abdominal energizer” fitness product is exponentially stronger—more than 1,724 times stronger—than the impulse a dog receives from a pet containment collar set at its highest level.

**Dr. Klein notes that “in the case of dog training, it is not the muscle contraction that is desired, but ‘the sensation of electric current’ as a reminder.”*

Although not depicted on the chart (page 6), Radio Systems Corporation has established during its product testing that the output voltage a human would receive from a nylon carpet at 50 percent relative humidity is more than twice the output voltage that a dog would receive from any of its three types of electronic training devices set at low levels. At 20 percent relative humidity, the carpet would produce a sensation more than nine times stronger than a low-level electronic stimulation. This variance is reduced somewhat when the electronic training device is used at higher levels as indicated in the graph, but remains less than the muscle stimulation devices mentioned above.

Table 2: Relative Energy Comparison of Electronic Training Devices and Common Sources of Static Impulses



Source: Philips Testing Service (a division of Philips Consumer Electronics Company)

Multiple Levels of Sensitivity to Suit Each Dog’s Temperament

A vital feature of today’s electronic training products is that instead of the obsolete “one size fits all” approach, it is now standard for most devices to offer a range of electronic static stimulation levels from which owners may choose, depending upon their dog’s temperament, breed, size, activity level and environment.

In 2002, Radio Systems Corporation received an endorsement by the International Association of Canine Professionals for its “Gentle LiteTouch™” pet containment training method. This breakthrough set a new industry standard by offering a wide range of stimulation adjustment for containment products.

Today, a survey of current remote training collars reveals a choice of stimulation levels ranging from five to eighteen in various modes of operation.¹⁴ This expanded range of choice is now commonplace among nearly all leading manufacturers of electronic training products.

Case 5 – Electronic Training Devices Aid in Easily Achieved, Lasting Behavioral Change

Research and the experience from dog training professionals indicate that the correct use of electronic training leads to more thorough and durable learning.

A team of Norwegian researchers conducted a two-year study of the effect of electronic training devices on 114 hunting dogs, specifically breeds which exhibited a strong instinctive drive to kill sheep. A group of dogs was given a sheep confrontation test in the first year: they received an electronic stimulation for predatory behavior if they wandered within two meters of a sheep.

In the second year of identical testing on the same group, the dogs showed weakened, delayed, and hesitant behavior, indicating that **a)** learning had taken place; and **b)** behavior modification learned previously was retained by the dogs over a relatively long period of time. Only one of the 114 dogs that received electronic stimulations the first year required it the second year.

The researchers F.O. Christiansen, M. Bakken and B.O. Braastad, concluded that “aversive conditioning with the use of electronic dog collars may be an efficient method for reducing the probability of a dog chasing or attacking grazing sheep.”¹⁵ And from a psychological standpoint, the dogs’ owners reported “no negative effect on the dogs’ behavior during the year ensuing electronic treatment.”

Advantages of Using Electronic Training Devices

The new generation of electronic training devices offers several benefits over other stand-alone behavior modification methods such as leash or clicker training.¹⁶

- **Speed / timing of stimulation**

With a remote trainer, owners can deliver the appropriate signal at the exact instant they want to obtain the dog’s attention. There is no time delay such as is associated with offering a treat, or taking up slack on a leash, or catching the dog if it is far away.

- **Effective for any size combination of person and dog**

Unlike leash training, which can require significant size and strength to perform safely and effectively, electronic training devices may even be used by persons with physical disabilities. In all human-dog training situations, regardless of size, the goal is to remind the dog that it is part of a team, not acting alone.

- **Consistency—Can be used at all times in all appropriate situations**

Many dogs are not motivated to work for anything but food, which can become problematic for dogs and for handlers. A dog may be a model student in obedience class, only to forget everything it has learned upon re-entry into the real world. Use of a remote trainer ensures that the owner can consistently correct or reward the dog instantly, without a constant stream of treats, an extremely long leash, or physically pursuing the dog.

- **Control—Allows the handler to maintain gentle, effective control of the dog even at a distance.**

In certain situations, such as animal-assisted therapy or police dog work, it is of the utmost importance to everyone involved that a dog be under control at all times. Observations such as the following illustrate the value and flexibility of the electronic training option for almost any kind of situation when used properly:

“Our Canine Unit has been in existence for 15 years and has depended greatly on the use of remote training collars. The devices aid in teaching new exercises using low-level stimulation. They are also very useful in controlling the dog at a distance while allowing our officers to keep their hands free, a very important officer safety issue. Most important, it limits the department’s liability. We have yet to have an accidental bite of an innocent bystander...If we can prevent our dogs from placing themselves in dangerous situations by the use of low-level stimulation, it is our responsibility to do so.”
—Sgt. Rod Hampton Canine Unit Supervisor, Round Rock (Texas) Police Department¹⁷

Potential Negative Effects Resulting from Incorrect Use of Electronic Training Devices

In its publication addressing the effective, humane, professional standards for dog trainers, the Delta Society, an organization that promotes the human-animal bond, presented a detailed evaluation of the risks associated with electronic and non-electronic training equipment. It noted that all training equipment and methods, including tools as seemingly benign as food and toys, could be harmful if used incorrectly.¹⁷ Examples cited include:

- Flat collars can put pressure on the airway and cause gagging when the leash is tightened
- Muzzles that prevent the dog from opening its mouth can quickly cause overheating due to the dog’s inability to pant
- Overuse of food rewards can cause an overweight condition

The table below is a compilation of risks and warnings that the Delta Society advises users to be aware of when using electronic training devices:

Radio Systems Corporation recommends that owners thoroughly read their owners manual for any electronic training devices in order to understand its functions and practical uses.

Case 6 – A Word About Pressure Necrosis (or Contact Dermatitis)

Pressure Necrosis is a commonly misunderstood condition. Some individuals mistakenly believe that Pressure Necrosis (also known as “contact dermatitis” or “decubitus ulcers”), caused by a too-tight collar, is a burn that appears to have been caused by the collar.

According to Dr. Dieter Klein, referenced earlier, “The electric properties and performances of the modern low-current remote stimulation devices (with current intensity of less than 100 mA) are comparable to the electric stimulation devices used in human medicine. Organic damage, as a direct impact of the applied current, can be excluded.”

Robert E. Schmidt, D.V.M., PhD, Zoo/Exotic Pathology Service, West Sacramento, California, stresses that prevention of pressure necrosis is the best treatment. “If reddening of the skin is noted, the tightness of the collar should be evaluated,” advises Dr. Schmidt. This would entail removing or

loosening a too-tight collar that is causing ischemia, which can lead to pressure necrosis if incorrectly diagnosed as burns, or if not diagnosed until later stages of ulceration. Pet owners need to check for proper fit and irritation on a daily basis. Debris that comes between the dog’s neck and the device may be an irritant as well and should be checked daily as well. Collars should not be left on a pet for more than 8 to 12 hours at a time.

Proactive veterinarians should consider asking dog owners if they plan to use electronic training devices and briefly explain how to check for proper collar fit so as to avoid pressure necrosis.

Are Electronic Training Devices Right for Your Dog?

Regardless of their previous attitudes toward electronic training devices, after considering the information presented in this paper, veterinarians should be confident that people and dogs in the following categories can benefit from the use of new, enhanced products for addressing a wide range of pet behavioral health and obedience training issues:

- Well-intentioned pet owners capable of following basic instructions for product use
- Non-aggressive, non-phobic dogs

Device Type	Limitations	Risks and Warnings
Anti-bark collars	May need to trim or shave hair on dog’s neck to ensure contact points touch skin.	Shock may result in fearful or aggressive response to a person or other animal near wearer. Contact points may irritate skin, causing infection, so dog’s neck should be examined frequently.
Remote training collars	Training goals should be achieved with minimal repetitions. May need to shave hair on dog’s neck to ensure contact points touch skin.	Shock can trigger aggressive behavior or stress severe enough to interfere with learning. Contact points may irritate skin, causing infection.
Electronic containment systems	Not recommended for dogs with existing fear or aggression problems.	Dog may be injured or traumatized by other animals crossing or approaching the boundary.

Source: Delta Society

Additionally, senior citizens and physically challenged owners and their dogs may especially benefit from electronic training devices, notes Jerry Wolfe, President of Triple Crown Dog Academy, “...these devices have also shown great benefit to senior citizens who do not have the strength or proper timing when using a conventional leash and collar. We have also experienced, in working with handicapped pet owners, that these devices are sometimes the only way for them to safely train and control their dog, especially in public environments with enhanced distractions and possible presence of other dogs.”¹⁹

Choosing the Appropriate Stimulation Level for Electronic Training Devices

“Starting at too high an intensity can cause an extremely fearful or aggressive response, but starting at too low an intensity can cause habituation.”

—Delta Society

Veterinarians should encourage dog owners to read all package instructions before using any electronic training device. In addition to providing product safety information, some manufacturers also provide suggested, step-by-step written or electronic details on how to properly combine voice commands with electronic stimuli to effectively achieve the desired result. In many cases these instructions are prepared by professional dog trainers on behalf of the manufacturer.

Because advanced electronic training devices offer a range of stimulation settings, it is always advisable that dog owners find the lowest setting that is effective for their dog before beginning training.

Owners are advised to quickly determine what Phyllis Giroux, D.V.M., CAC, of the Deep Run Health Care and Training Center in Goldvein, Virginia, and quoted previously, refers to as the “recognition” level. “This is the level at which the dog can recognize that he is receiving some signal from the training device,” says Dr. Giroux. “The correct level for training is that level at which we have the dog’s attention, whether we get it in the form of a treat, a click, a vibration or a low-level stimulation.”

Case 7 – Anecdotal Evidence from Respected Veterinarian/Trainer is Positive

Several scientific studies on the physical and psychological effects of electronic training devices have been presented, yet some of the most compelling arguments for the judicious use of electronic training devices are found in anecdotal evidence.

“In the past ten years at our training center, we have ‘rescued’ over 100+ dogs that would have been turned in to shelters or euthanized because the dogs were deemed uncontrollable. These are dogs from normal households that failed to learn for whatever reason. These dogs come to our training center and spend two to four weeks learning how to respond to the training collar. We do not punish with it, but teach the dog to pay attention, learn right from wrong, and develop self-control and a solid sense of teamwork. These dogs go back home with their owners, who easily maintain control by occasional application of a tone or stimulation to remind their pet of the rules.” —Phyllis Giroux, D.V.M., CAC

“I like the way (static stimulation) works and the fact that it gives “gentle” to high level reminders to keep behavior in check” —Shirley Lehmann, Veterinary Technician, Red Deer, Alberta, Canada.

Conclusions

Despite increased efforts by national and grass-roots organizations to slow the growth of the unwanted animal population, the fact remains that a large percentage of dogs in shelters or roaming city streets are without a home because they failed to integrate successfully into family life.

Veterinarians who proactively address behavioral issues with dog owners can help make significant reductions in the number of dogs that are sheltered or euthanized. This paper indicates that the appropriate use of modern electronic training devices is a valuable tool for the majority of behavioral and containment issues that frustrate dog owners.

Based on the information presented here, veterinary professionals should feel comfortable recommending electronic training devices to responsible dog owners. They should continue to encourage owners to evaluate the training options that best suit their individual pet's needs, and read and understand all training device instructions prior to product use. When used in accordance with manufacturers' instructions, it is reasonable to expect successful outcomes from electronic training devices in the overwhelming majority of cases, without physiological or psychological effects to the dog.

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Bibliography

- ¹ *Handbook of Applied Dog Behavior & Training, Volume Three, Procedures and Protocols*, Steven R. Lindsay, 2005, Blackwell Publishing, p. 570
- ² Lindsay, p. 586
- ³ Lindsay, p. 593
- ⁴ Nicholas Dodman, Director of Animal Behavior Clinic, Tufts University School of Veterinary Medicine; author of *The Dog Who Loved Too Much*, Bantam Books, 1996; and *The Cat Who Cried for Help*, Bantam Books, 1999.
- ⁵ Nova Online – Animal Hospital, produced for PBS by WGBH Science Unit
- ⁶ Randall Lockwood, PhD, Senior Vice President, Anti-cruelty Initiatives and Legislative Services, The American Society for the Prevention of Cruelty to Animals (ASPCA).
- ⁷ Radio Systems Corporation industry research, 2007.
- ⁸ Lindsay, p. 569
- ⁹ Radio Systems Corporation industry research, 2007
- ¹⁰ “Top Line Summary from interviews conducted at the North American Veterinary Conference: January 2003,” Radio Systems Corporation, 2003.
- ¹¹ Steiss, J.E., Schaffer, C., Ahmad, H.A., and Voith, V.L., 2007, Evaluation of Plasma Cortisol Levels and Behavior in Dogs Wearing Bark Control Collars. *Applied Animal Behaviour Science* 106, pp. 96-106. A copy of this study is available upon request, by contacting Radio Systems Corporation.
- ¹² Dave Head, Director, Knox County Animal Control, June, 2007 Knox County study, Knoxville, TN.
- ¹³ Dieter Klein, “How Dangerous are Remote Stimulation Devices for the Training of Dogs?” originally published in *Amtstierärztlicher Dienst und Lebensmittelkontrolle*, 2000.
- ¹⁴ Jerry Thomas, “The Modern Remote-Training Collar—This is Not Your Father’s ‘Shock Collar,’” *Gum Dog Magazine*, June/July 2004, p. 56-61.
- ¹⁵ F.O. Christiansen, M. Bakken and B.O. Braastad, “Behavioural Changes and Aversive Conditioning in Hunting Dogs by the Second-Year Confrontation with Domestic Sheep,” *Applied Animal Behaviour Science*, April 26, 2001
- ¹⁶ Phyllis Giroux, D.V.M., CAC, “The Shocking Truth About Remote Trainers,” *The Whole Dog Journal*, Vol. 4, No. 2, February 2001.
- ¹⁷ Sgt. Rod Hampton, Round Rock (Texas) Police Department Canine Unit Supervisor, open letter, August 7, 2002.
- ¹⁸ Delta Society, Professional Standards for Dog Trainers: Effective, Humane Principles. Renton, WA: Delta Society, August 2001, 26-28.
- ¹⁹ Jerry Wolfe, President, Triple Crown Dog Training Academy, letter to Phil Alder of the Department for Environment Food and Rural Affairs (United Kingdom), May 20, 2004.

Suggested Additional Reading

Leslie Sinclair, D.V.M., “Electronic Aid,” HSUS News, Summer, 1998.

Lance Bauman, “The How’s and Why’s of Pet Containment,” *Safe Hands Journal*, International Association of Canine Professionals, Vol. 5, Issue 2, Summer 2004

www.trainmypet.net

www.ecma.eu.com

www.tcog.eu

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Radio Systems Corporation promotes responsible pet ownership. Please remember to spay and neuter your pets.

Truths About Spay and Neuter

“Just one litter and we’ll have her spayed” has led to thousands of cats and dogs being euthanized all over the world. Choosing to have your pet spayed or neutered impacts not only you but the community around you.

Just because your cat or dog does not run loose, does not mean they do not need to be spayed or neutered. Not having them spayed or neutered increases the likelihood that they will try to escape and find a mate.

When you have a litter of puppies or kittens and find homes for all of them, that takes away that possible home from a shelter animal which may result in that shelter animal being euthanized.

Spaying and neutering your pets will prevent unwanted litters and eliminate many behavior problems associated with the mating instinct.

Female pets benefit from spaying because their heat cycles are eliminated and generally the negative behaviors that may lead to owner frustration and, ultimately, a decision to relinquish the pet to a shelter are reduced.

Spaying or neutering your pet early will prevent certain forms of cancer.

Spaying or neutering your pet will reduce his/her caloric needs. Too much food and not enough exercise will make your pet fat and lazy. Be sure to reduce portion sizes to prevent your pet from becoming overweight which may lead to harmful diseases or life threatening health issues.

Having your pet spayed or neutered will alter their personality. They will be more content to stay home and neutered males are less aggressive.