

The Facts About Modern Electronic Training Devices

Today's technology is surprisingly subtle, more effective

“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.”¹

— Randall Lockwood, PhD
Vice President for Research
and Educational Outreach
The Humane Society
of the United States

In the 30 years since the first “shock collars” became widely available in the United States, these increasingly popular behavioral training products have been refined to produce more effective results in ways that have proven not only to be humane, but also—in fact—gentle.

While the technology behind modern electronic training devices has come a long way, some veterinarians and consumers harbor misconceptions about these products and their effect on dogs based upon their impressions of older, crudely designed devices. To the contrary, clinical studies in recent years offer conclusive evidence that the proper use of modern electronic training devices does not lead to adverse physiological effects on dogs.

This paper presents case studies, conclusions and informed opinions on risks versus benefits 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 others who have tested and observed the effects of electronic training devices on dogs in shelters and laboratories, on farms and in other real-world settings.

As you will gather from reviewing the current literature, 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.

This paper dispels a number of myths about electronic training devices. As evidence of the evolving body of knowledge about today's technology, conclusions about the safety and effectiveness of modern electronic training devices are supported by The Humane Society of the United States, The American Society for the Prevention of Cruelty to Animals (ASPCA) and the International Association of Canine Professionals, among others.

Because dog owners frequently ask veterinarians how to address common behavioral issues, professionals have an opportunity to impart credible, proactive and vital information that can greatly increase the likelihood of a dog's acceptance into the family. This paper's purpose is to help you become more familiar with credible research into and objective facts about today's products so as to be conversant when discussing behavioral solutions with dog owners.

Myths About Electronic Training Devices

Evidence exists that almost all veterinarians are concerned about the alarming rise in shelter populations and euthanasia statistics—many of which are attributable to behavioral issues. Because veterinarians are in a unique and credible position to proactively educate dog owners about behavioral health, it is helpful to be aware of the latest tools that dog owners may employ to help their pets succeed as valued and permanent members of the family.

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

- They make dogs aggressive;

Or, conversely . . .

- . . . The devices only work on aggressive dogs
- They “shock” the dog
- Electronic collars can cause burns
- Dog owners have to be expert trainers to use the devices

Uses for Electronic Training Devices

A survey 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. These behaviors include but are not limited to:

- Excessive barking
- Pulling on leash while walking
- Bolting through doors
- Digging
- Failure to come when called
- Jumping up on owners / visitors
- Hurdling fences
- Roaming
- Chasing cars / people
- Destructive behavior
- Trash raiding
- Containment issues

Origin and Evolution of Modern Electronic Training Devices

U.S. pet owners purchased more than 2 million remote training devices, pet containment systems and bark collars in 2001.

— Radio Systems Corporation industry research

Over the years, electronic training devices have been known by many monikers—most notably and most graphically “shock collars.” Other terms include “electronic collars,” “e-collars,” and also “remote trainers” when used in a generic sense.

The current and more accurate term “electronic training devices” recognizes that while the products do incorporate a

degree of electrical or “static” stimulation, the term “shock” is a misnomer for today’s technology. 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.

Since becoming widely available, consumer awareness and 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 4 million annually by 2007 — indicating acceptance by consumers in greater and greater numbers.

Types of Electronic Training Devices

Modern electronic training devices deliver a low-voltage electrical correction through contact points attached to a dog collar. The products are generally broken down into three classes, each with its own training applications.

Pet containment systems offer a method of keeping a dog at home within a yard without the necessity of constructing a physical barrier. They may be installed in-ground for aesthetics, or above ground as a standalone solution or reinforcement for an existing barrier that is not keeping the dog contained. In addition to newer wireless models there are also systems designed for indoor use that can be scaled from very small to larger areas.

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

Training collars or “remote trainers” allow the owner to train the dog at close range or at a distance, even when it 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 held by the user. When the appropriate button is pressed on the hand-held transmitter, the dog receives a warning tone or a stimulation (electronic, vibration, etc.).

In addition to being useful for deterring undesired behaviors, remote trainers have also proven highly effective for teaching obedience 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.

Where Veterinarians Currently Stand 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 percent of professionals stating that they would recommend them in many cases.²

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 products 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

Because behavior problems are the reason that a significant number of dogs end up in shelters, research has been done 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, of the Tuskegee University College of Veterinary Medicine, conducted a 4-week study of adult shelter dogs' physiological and behavioral responses to bark control collars.

Dogs were randomly assigned to either an electronic 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.³

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 only on the first day of wearing the collars.

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.

What Electronic Training Devices Are and Are Not

What makes today's electronic training devices more humane than their predecessors? Nearly all products from all manufacturers emit only a very mild electrical stimulation. These devices draw their current from batteries and are thus very limited. The energy level is similar to what one gets when 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.

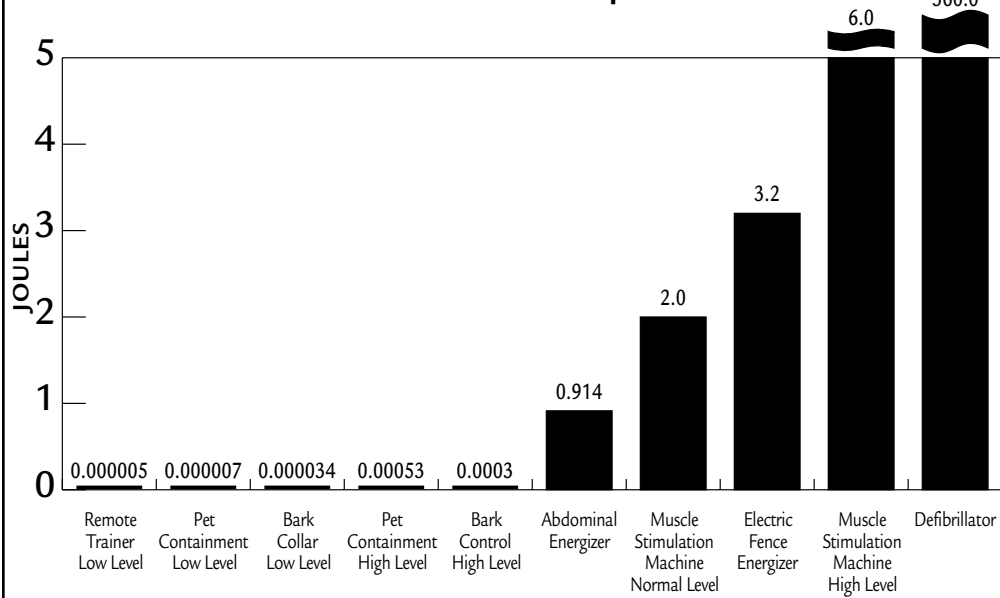
Case 2 – Researcher Finds No Evidence of Organic Damage from Electronic Training Devices

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."⁴

Case 3 – What Does a Static Correction Really Feel Like?

The following table 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

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)

contractions* a human receives from an “abdominal energizer” fitness product is exponentially stronger—more than 3,046 times stronger—than the impulse a dog receives from a bark 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 above, Radio Systems Corporation found when testing its products 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.

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 impulse levels from which owners may choose depending upon their dog’s personality, 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 the standard for the industry to aspire to in 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 18 in various modes of operation.⁵ This expanded range of choice is now commonplace among all leading manufacturers of electronic training products.

Case 4 – Electronic Training Devices Aid in Fast, Lasting Behavioral Change

Research and anecdotal evidence from dog training professionals suggest that dogs can learn faster and achieve true long-term learning when conditioned with electronic training devices.

A team of Norwegian researchers conducted a two-year study of the

effect of electronic training devices on 114 hunting dogs of breeds that exhibited a strong instinctive drive to kill sheep. A group of dogs was given a sheep confrontation test in the first year by which they received an electronic correction for predatory behavior when they got 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 the previous year was retained by the dogs over relatively long periods of time. Only one of the 114 dogs that received electronic corrections the first year required it the second year.

The researchers found that 18 of the 24 dogs reported by owners to exhibit behavioral changes lost their previous interest in sheep.⁶ And from a psychological standpoint, the dogs’ owners reported “no negative effect on the dogs’ behavior during the year ensuing electronic treatment.”

Contrary to what one might expect, electronic bark control collars do not extinguish the bark response, notes Radio Systems Corporation. When the collar is removed, the dog will still bark to alert to strangers.

Advantages of Using Electronic Training Devices

Using modern electronic training devices offers several benefits over other standalone behavior modification methods such as leash or clicker training.⁷

- **Speed/timing of correction/stimulation**

With a remote trainer, owners can deliver the appropriate signal at the exact instant they want to get the dog’s attention. “There is no time delay like there is associated

with a treat, or taking up slack on a leash, or catching the dog if it is far away,” explains Keith Benson of Triple Crown Dog Training Academy, the largest canine training and behavior center in America.

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

Unlike leash training, which can require significant size and strength to use safely and effectively, electronic training devices may even be used by persons with disabilities. In all human/dog training situations, regardless of size, the goal, Benson explains, 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**

As many who rely on food treats as rewards will probably attest, it can quickly become difficult to motivate some dogs to work for anything other than food. Still other dogs are model students in obedience classes but seem to forget all they have learned once they are in the “real world.” Use of a remote trainer ensures that the owner can consistently correct or reward the dog instantly without having to feed a constant stream of treats, manage an extremely long leash, or chase the dog down to remind it to cooperate.

• **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 all involved that a dog be under near-failsafe control at all times.⁸ 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 13 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 Department.

Note that in an environment where one might expect more forceful handling of the dogs than might be acceptable to vets and owners, the police department’s handlers prefer to train using low stimulation levels.

Potential Negative Effects Resulting from Incorrect Use of Electronic Training Devices

While much current literature on electronic training technology focuses on benefits, there is little doubt that incorrect use of the devices can pose some degree of physical and/or psychological risks to dogs.

In its publication addressing effective, humane professional standards for dog trainers, the Delta Society, an organization that promotes the human-animal bond, presented a detailed rundown of risks of 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.⁹ 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 inability to pant
- Overuse of food rewards can cause an overweight condition

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

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

Case 5 – A Word About Pressure Necrosis (or Contact Dermatitis)

Because of the exponential rise in the use of electronic training devices, many veterinarians are noting an increase of infection, necrosis, contact dermatitis, and/or scarring at the collar site on the neck.

Of particular concern, some are mistaking pressure necrosis (also known as “contact dermatitis” or “decubitus ulcers”) caused by too-tight collars for burns that appear to have been caused by the collar.

According to 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 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.

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.

Who Are Good Candidates for Using Electronic Training Devices?

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 fitting this description can benefit from the use of today’s enhanced products for addressing a wide range of behavioral health and obedience training issues:

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

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.¹⁰

“ . . . 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 dogs, especially in public environments with enhanced distractions and the possible presence of other dogs.”

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 beginning to use electronic training devices. In addition to providing product safety information, some manufacturers also give suggested, step-by-step details in writing and/or via video for how to properly combine voice commands with electronic stimuli to effectively achieve the desired result. In many cases these instructions are provided by professional dog trainers.

Because today’s electronic training devices offer a range of correction settings, it is always advised that dog owners begin training on the lowest setting and observe the dog closely to gauge its response.

Therefore 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, 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 6 – Anecdotal Evidence from Respected Veterinarian/Trainer is Positive

While this paper has presented several scientific studies on the physical and psychological effects of electronic training devices, some of the most compelling arguments for the judicious use of electronic training devices are found in anecdotal evidence.

“In the past six years at our training center we have ‘rescued’ over a hundred 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

Conclusions

“Electronic training aids that are improperly designed, maintained, fitted, adjusted or employed may also present risks, but their proper use in conjunction with reward-based obedience training has demonstrated benefits to many thousands of dogs and their owners.”

— Randall Lockwood, PhD
Vice President for Research and Educational Outreach
Humane Society of the United States

“Behavior problems are the largest preventable cause of death in dogs in the United States,” says Steve Appelbaum, president of Animal Behavior College, a school for professional trainers, which has graduated more than 1,300 professional dog trainers. “We know that 40 to 70 percent of all dogs in animal shelters are there because of untreated behavior problems.”¹¹

Despite the stepped-up efforts of national and grassroots organizations to slow the growth of the unwanted animal population, the fact remains that a large percentage of dogs in shelters or on the street got there because, for any number of reasons, they failed to integrate successfully into family life.

Veterinarians who proactively address behavioral issues with dog owners can contribute significantly to helping reduce the alarming shelter and euthanasia statistics. This paper has made the case that appropriate use of modern electronic training devices are an appropriate tool for the majority of behavioral and containment issues that frustrate owners.

Based on the information presented here, veterinary professionals should be assured in recommending these devices to responsible owners while also encouraging them to read and understand the package instructions before using the products. With the proper application of electronic training devices per manufacturers’ instructions, it is reasonable to expect successful outcomes in the majority of cases with no adverse physiological or psychological effects on the dog.

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Suggested Additional Reading

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- 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.

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