

The Facts About Modern Electronic Training Devices

Today's technology is surprisingly subtle and effective

Both radio-controlled and behaviour-activated electronic devices have been recognised 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-lead control. If minimising the intensity, duration, and frequency of aversive stimulation during training is recognised 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 the newest generation of electronic training devices have resulted in more reliable and safe products.

This 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 behaviour 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 behaviour or modify behaviour 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.

Although it is acknowledged that various aversive stimuli are used in electronic training devices (ultrasound, spray and static pulse), we will concentrate in this paper upon the static pulse types which seem to attract the most attention. Much of the references in this paper are from the USA where usage of electronic training devices is most widespread, however the points and findings are equally relevant to Europe.

Relinquishing pets to shelters because of behavioural problems is a growing crisis. "...death from behaviour

problems is the leading cause of pet mortality,” according to Dr Nicholas Dodman, Director of the Animal Behaviour 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 Many of the pets brought to shelters are surrendered there because of behaviour problems that their owners believe to be permanent. In the UK 19,000 dogs were re-homed in 2004, many for behaviour related problems. Many of these animals end up being “put to sleep,” making death from behaviour problems a leading cause of pet mortality, along with trauma and disease. The problems range from aggression and house soiling to fear and anxiety-based conditions, including various compulsive behaviours.”⁵

It is our intent to explain why the use of modern electronic training devices can be beneficial in reducing behavioural issues that may cause relinquishing of pets to shelters, save pets from harm and improve the human-pet bond. In the 30+ years since the first electronic training devices became widely available, these increasingly popular training aids 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 harbour 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 behavioural 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 behavioural 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 behaviour 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 behavioural modification, obedience training and containment needs.

Modern Electronic Training Devices Save Dogs Lives

“...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 behavioural issues are directly contributing to unacceptably high shelter populations and euthanasia statistics. Veterinary professionals should be knowledgeable about 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 quite severe or challenging behaviour problems, thus reducing the likelihood of dogs being relinquished to a shelter, or abandoned, or indeed the need for prolonged and often expensive work by a professional dog trainer.

Careful reading of this paper will dispel some misconceptions about alleged, occasional negative side effects of electronic training devices and illustrate the positive benefits, highlighting the importance of appreciating the balance of risk and benefit that is essential to a mature view of dog training. There is no doubt that these devices save hundreds or thousands of pets' lives in the course of a year. Being involved in a road accident is a major cause of death or injury for both cats and dogs. This should be an important consideration in evaluating the balance of risk and benefit in electronic training.

Uses for Electronic Training Devices

It is important to note that electronic training devices should be used as an integral part of a reward-based training regime.

A review of current literature from canine behaviourists, psychologists, and veterinary researchers suggests that many behavioural problems other than aggression, fears and anxiety-related behaviours 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 behaviour issues. No dog training method provides a blanket solution for all behaviour 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 names—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 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 behavioural and motivational responses to it.”*⁸

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.

Currently available products use sophisticated and sensitive controls coupled with agreed power limits, and are being used safely and effectively to ensure the safety and wellbeing of tens of thousands of UK pets.

As the benefits to owners and pets have become more widely known worldwide, sales of electronic training devices have grown steadily from approximately 200,000 units in 1996 to more than 2 million units today. It is estimated that 70,000 units are sold each year in the UK and that 350,000 units are currently in use. Worldwide 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:

Containment fences

Containment fences give pets freedom to roam within a safe area (such as your garden) without the risk of escaping. Animals escaping from gardens are frequently run over by cars, or cause road accidents. Containment Fences consist of a transmitter mounted inside the house, connected to a loop of wire which defines the boundary of the safe area within which the animal will be contained. The animal wears a receiver collar which listens for the signal from the boundary. The collar emits a series of “tones”, warning the

animal to stop. If the animal ignores the beeping and goes to the boundary, the collar emits a mild aversive stimulus. The level of stimulus is variable and is set to the minimum level which works for the particular animal. Very quickly, the animal associates the tone with the aversive stimulus and learns to stay within the boundary of the safe area. Once this is learnt, the animal responds to the tone alone and does not receive the aversive stimulus.

Remote trainers

Remote trainers allow pets and owners the freedom to go on walks without a lead. Dogs can take it into their heads to chase other dogs, cats, cars, bikes or farm animals with catastrophic results. In these situations it is very difficult to get the dog’s attention. The remote trainer allows the owner to reach out to the dog while it is in full flight and break into its concentration. This can save the lives of people, dogs and farm animals. The owner carries a small transmitter which communicates with the collar worn by the dog. The owner can send signals to the collar which responds with either just warning tones, or a warning tone and mild aversive stimulus. The level of the stimulus is adjustable and can be set to the minimum level necessary to suit the animal’s nature and the situation. Very quickly, the dog learns to associate the tones with the aversive stimulus and control can be effected using the tone only.

Bark Control

Nuisance barking can result in problems with the neighbours, or even with local noise authorities. Dogs are frequently re-homed (sometimes many times) due to excessive barking. Bark control collars detect excessive barking and respond by delivering a tone followed by a mild aversive stimulus. The dog quickly learns to associate excessive barking with the tone and the aversive stimulus and nuisance barking stops.

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 behaviour.

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?

A survey of UK vets is currently under way and the results will be added to this paper as soon as possible.

The following research project provides reassurance to those 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 behaviour 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 Dr Janet Steiss, D.V.M., Tuskegee University College of Veterinary Medicine, conducted a four-week study of adult shelter dogs' physiological and behavioural 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 behavioural 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. 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 static stimulation at lower levels. Most 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.

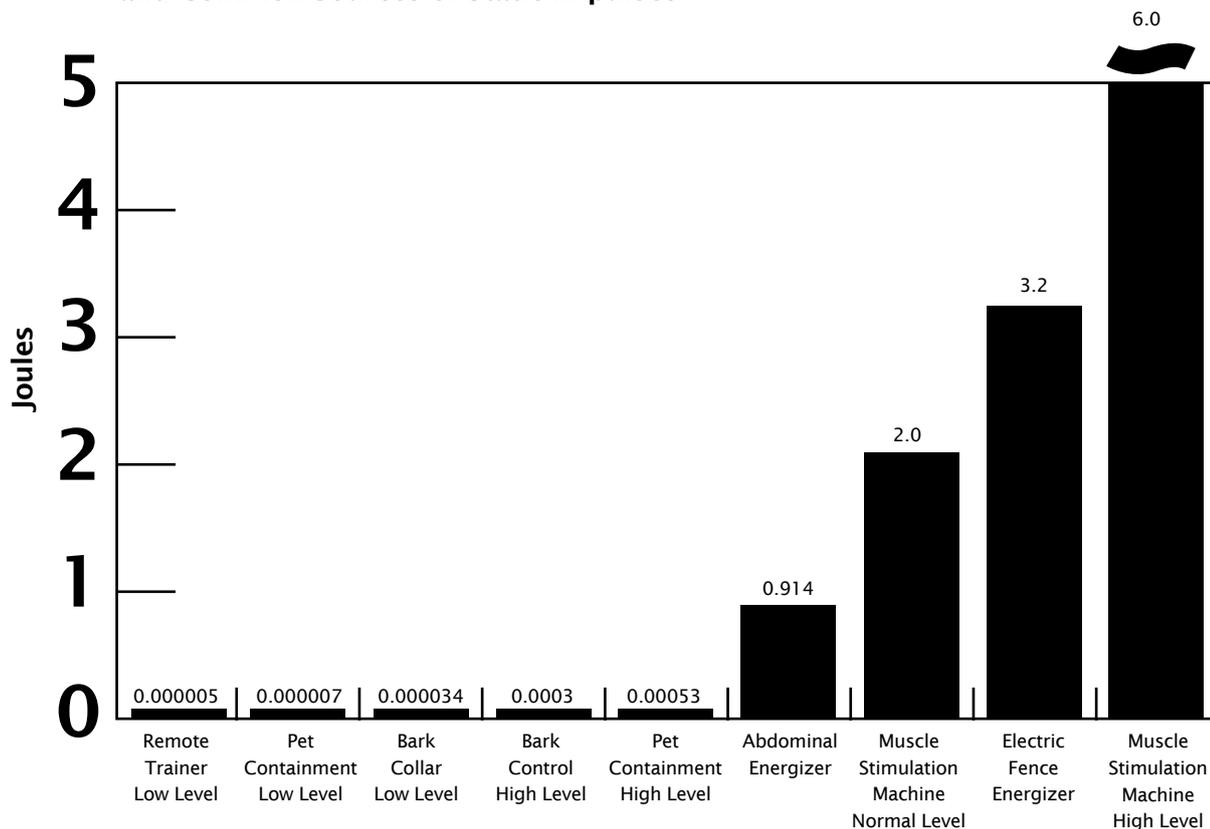
Case 3 – Researcher Finds No Evidence of Organic Damage from Electronic Training Devices

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 Static Stimulation 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 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. Although not depicted on the chart (table 2), ECMA has established during 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

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)

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 chart, but remains massively less than the muscle stimulation devices mentioned above. It should be noted that the electric stock fences commonly used to contain farm animals and horses have energy outputs more than 6,000 times higher than an electronic training device. The impulse an animal receives from a stock fence passes *through* the whole body whereas the impulse from an electronic training device passes *across* approximately 2 inches of skin.

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.

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 Behavioural 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 behaviour if they wandered within two metres of a sheep.

In the second year of identical testing on the same group, the dogs showed weakened, delayed, and hesitant behaviour, indicating that a) learning had taken place; and b) behaviour 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’ behaviour during the year following electronic training.”

Advantages of Using Electronic Training Devices

The new generation of electronic training

devices offers several benefits over other stand-alone behaviour 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. Remote trainers reach the dog at distances where a ‘clicker’ would not be heard.

• 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

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”) caused by a too-tight collar, is a burn that appears to have been caused by the collar - this is simply not possible.

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, 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.

It should be noted that in 2002 the Australian RSPCA were forced to pay substantial damages after issuing a press release including an assertion that burns could result from the use of electronic training collars.

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, dog owners 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 behavioural 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, “...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.”¹⁸

Choosing the Appropriate Stimulation Level for Electronic Training Devices

Dog owners should be encouraged to read all package instructions before using any electronic training device. In addition to providing product safety information, most 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.

It is vital 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 selfcontrol 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 behaviour in check”
—Shirley Lehmann, Veterinary Technician, Red Deer, Alberta, Canada.

Reward and Punishment

Opponents of electronic training sometimes put forward a false division of training into reward-only or punishment-only. This is false because anyone of good will who trains a dog will always reward the dog for behaving in the required manner. Electronic training devices work best, and are intended to be used, as part of a normal reward-based training program.

The Need For Further Legislation?

There is an extremely small minority of owners who are uncaring or even abusive towards their pets. Civilised countries recognise this and have sensibly passed laws to give the power to prosecute and convict such individuals. Good laws are already in force to protect pets in the UK from such individuals. There is no need for specific extra laws covering electronic training devices.

Conclusions

Any disbenefits of electronic training devices are hugely outweighed by the benefits of freedom and peace of mind for pet and their owners.

This paper indicates that the appropriate use of modern electronic training devices is a valuable tool for the majority of behavioural and containment issues that frustrate dog owners. The use of electronic training devices can make significant reductions in the numbers of dogs that are sheltered or euthanised.

Based on the information presented here, veterinary professionals should feel comfortable recommending electronic training devices to responsible dog owners.

Dog owners should be encouraged 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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Suggested Additional Reading

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