C.A.B.T.S.G.

INTERNATIONAL VETERINARY BEHAVIOUR MEETING

DAY TWO
SESSION THREE

WORKSHOP SESSIONS.

A: WHAT ABOUT WELFARE?
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B: THE DIAGNOSTIC DILEMMA.
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A Comparison Of Different Anti Barking Devices.
Aversive And Disruptive Stimuli

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Recently, a number of anti-barking devices have appeared on the veterinary market and it seems important for us to summarise the objective research parameters that can be used to assess the efficacy and harmlessness of such devices.

This document describes the most recent research parameters for behaviour modification devices. It has been compiled in the light of recent scientific publications and personal communications on research carried out in the USA and France. In particular, we express our gratitude for the contributions of Dr. Pageant (President of G.E.C.A.F., French Veterinary Behaviour Study Group), Dr. Polsky (PhD, Los Angeles, USA), Dr. Hunthausen (Kansas City, USA, President of the American Veterinary Society of Animal Behaviorists) and Dr. Juarbe-Díaz (Animal Behavior Clinic, Cornell University, USA).

1. Social relevance

The fact that Man and animals live together in close proximity in large urban centres has exacerbated problems of behaviour: nearly 20% of all complaints from neighbours concern dogs barking. As a result, there have been increases in both the demand for anti-barking devices and in the number of all types of companies (specialists in behavioural problems and non-specialists).

2. Scientific developments

There are two ways of discouraging undesirable behaviours at this moment in time:
- pain (painful or aversive stimulus),
- the effect of surprise (disruptive stimulus).

These are the two principles on which the various types of anti-barking devices are based:
- ultrasound collars,
- so-called “pulse” collars that deliver an electric shock,
- citronella spray collars.

A dog can only associate two events if no more than a few seconds separate them, therefore, it is important to act quickly after the unacceptable behaviour. If you punish a dog for its behaviour in your absence after you have returned to the house, it does not understand what you are reacting to (you may have the impression that “it knows that it has done
something wrong" but the dog is actually reacting to your annoyance without realising that it is the cause itself). Therefore, it is important to act quickly after the unacceptable behaviour.

2.1 Ultrasound

Scientific references: studies carried out at the Veterinary University of Florida.

Ultrasound can be considered as either a pain stimulus (when it is relatively intense) or a disruptive stimulus (when of low intensity). With respect to the latter, it is a poor disruptive stimulus because the dog quickly becomes used to its surprise effect. On the other hand, ultrasound can be used as a warning signal, a function exploited in certain "combination" collars (ultrasound + electric shocks).

There is general agreement among serious investigators that the efficacy of ultrasound devices rarely exceeds 30% (Polisky, Hunthausen, Locher).

One explanation has been proposed: the punishment threshold is very close to the pain threshold in dogs (Pageot, personal communication) and therefore an effective device would be dangerous for the dog's auditory system. Manufacturers have tended to produce devices that are harmless but of dubious efficacy.

In the USA, veterinarians have effectively withdrawn ultrasound collars because they were rejected by over half of the clients on the grounds that they were ineffective (Hunthausen, personal communication). The results of the distribution of such devices in Switzerland have been inconclusive. There are no tests that demonstrate their efficacy at the scientific level.

2.2 Electric shocks


Electric shocks are painful stimuli. These collars have been in use for a long time in the USA. Early versions used high intensity shocks which were subject to spontaneous triggering and, sometimes, chain reactions. In addition, they caused burns. They were withdrawn from the market in 1983 following an F.D.A. investigation (study conducted by the Center for Veterinary Medicine).

More recent electrical collars are not subject to these problems. They integrate a safety system (protecting against chain reactions), a voice recognition system (protecting against spontaneous triggering) and use currents of lower intensity. Therefore, the stimulus no longer entails any danger but remains painful (punishment). The efficacy of such collars is variable but usually quite good. However, it is a pity that no serious studies of their efficacy and harmlessness have been published.
These collars present not only a serious ethical problem (painful stimulus) but more importantly, a scientific problem (see "Indications and Contraindications").

For all these reasons, electric shock collars are already banned in Switzerland and Scandinavia and are in the process of being banned in other countries. In Switzerland, the possession and use of electric shock collars is illegal apart from for a few recognised professionals (veterinarians, educators) who say they need to use them in therapeutic strategies aimed at modifying behaviour. They must seek permission from the Veterinary Office and are not allowed to sell the collars. Despite this, a few are sold every year under the counter which has recently led the Swiss authorities to raise the penalties for those found using the collars (penal responsibility).

2.3 Citronella spray

Landsberg (Veterinary Medicine, 1994; 10: 970-983)

Citronella spray is a real disruptive stimulus (Pageat, Veto-Alp Conference 95). In practice, the surprise effect associated with the triggering of the device (both auditory and olfactory stimulation) interrupts the behavioral sequence. Thereby, the behaviour to be discouraged is stopped as soon as it occurs.

The dog is uncertain for a period of time and appears to seek the source of this unusual smell. This period can be exploited to capture the attention of the dog and give it a command. Thus, a disruptive stimulus interrupts the behaviour that is to be discouraged and makes the dog receptive to commands.

The citronella spray stimulates four of the five senses of the dog: its senses of hearing, smell, seeing and touch (vaporisation of the propellant is associated with a local cooling). The disruptive effect is mainly associated with the olfactory and auditory stimuli. This process has no adverse side effects.

Studies carried out at the E.N.V. Lyon (Ph. Brunat, Veterinary Thesis, 1990), the E.N.V. Nantes (P. Piette, Veterinary Thesis, 1995) and at Cornell University in the USA (Soraya V. Juarbe-Diaz, 1995) agree that the mean efficacy of these devices is 80%. This result is supported by Dynavel's internal studies on client satisfaction. However, this strategy fails in 20% of cases.

In practice, a disruptive stimulus is all the more effective if it is unexpected and it loses the advantage of surprise if repeated routinely (Pageat, Veto-Alp Conference 95).
In the field, two clearly distinct populations are found:
- in most cases (80%), the first few times the collar is triggered the dog is profoundly surprised and ceases barking after a few attempts; however, it will only set the collar off a few times and not often enough to become used to it.
- in a minority of cases (20%), the dog reacts at first to the spray but gradually becomes used to its release and stops reacting (the stimulus is no longer disruptive); these dogs are highly motivated to bark, trigger the device regularly and therefore become used to the stimulus.

To resort to an electric collar in these circumstances is both useless and dangerous. Of course, the "vocalisation" symptom may be suppressed but the cause of the problem (separation anxiety, social phobia) will not be diagnosed and will certainly not be resolved. Electrical collars entail major risks with respect to behaviour modification: there have been accounts of dogs suffering from separation anxiety whose vocalisation problem has been treated with electric shocks and which have subsequently developed displacement activities such as licking and self-mutilation (Pageat, personal communication).

2.4 Indications and Contraindications

2.4.1 Social phobias

Dogs suffering from social phobias (aggressive behaviour towards other dogs) are made even more dangerous by the use of electrical collars.

Example: Shep, a two year old German shepherd, was behaving aggressively towards other German shepherds. Usually, Shep began an intimidation sequence (growling, barking) before attacking the other dog. Its owner, irritated by the noise it made during walks, decided to buy an electric anti-barking collar. Since Shep's motivation is strong (social phobia), when it comes across another dog, it barks in warning. Since it is wearing its collar, it receives an electric shock. Shep stops dead, lets the other dog move away and the collar has apparently worked. However, what Shep has actually learned is that whenever another dog is close, electrical punishment is triggered. This represents negative conditioning which can only reinforce Shep's social phobia. Every new meeting will entail a negative (painful) experience if Shep is agitated enough to bark. More seriously, Shep may quickly learn the association between barking and punishment: the intimidation sequence may be foreshortened or may even disappear and Shep attacks the other dog with no warning, surprising its owner who believed that the problem had been resolved. And this is an accident...

In the same way, the aggression of a dog towards an external stimulus can be reinforced. Imagine a child annoying a dog which is behind a gate. The excited dog barks and receives a shock. The lesson that it learns is: child outside the gate = punishment. Imagine
what it will want to do if the gate has unfortunately been left open the next time the child is there ...

It is our duty as veterinarians to strongly discourage the use of electrical devices in cases of this nature.

On the other hand, a disruptive stimulus could interrupt the behavioural cycle without exacerbating the aggression of the dog. A study conducted by P. Pageot confirms the value of disruptive stimuli (citronella spray) in treating social phobia (see "Disruptive stimulus: definition and application in behaviour therapy", Proceedings of the CATBSG International Meeting, April 1997).

2.4.2 Separation anxiety

The side effects of anti-barking devices are poorly understood. Electric shock collars represent obvious risks (of increased anxiety and of the development of displacement behaviour such as licking or self-mutilation) and should, therefore, be strongly discouraged.

Citronella spray collars only treat the symptoms. Therapeutic strategies that use citronella spray devices (Abovstop) in conjunction with drugs (anafestin, trioxazine) have given satisfactory results. Such strategies treat the cause and, at the same time, quickly respond to the problems of the owners (the vocalisation).

A few cases of panic attacks triggered by citronella spray devices have been recorded (Mueller, Proceedings C.N.V.S.P.A., Nov. 1995) but none of any displacement behaviour, until now. Studies that are currently underway may produce important information.

2.4.3 Territorial barking

It seems that, by interrupting the pattern of classically conditioned, disruptive stimulus-based anti-barking devices might reduce aggressive behaviour associated with the defence of territory.

Consider the case of a dog that has been an inveterate barker since it was a puppy. It hears the postman approaching the front door to deliver the mail and fear of an intruder causes it to bark. Subsequently, it hears the postman withdrawing. What has it learned from this experience? 'When I bark, people go away!' When this experience is repeated every day, it learns to frighten people by barking and thus, a natural level of barking has been aggravated to become excessive without the owner realising.

If a disruptive stimulus interrupts the barking at the beginning of the conditioning phase, such aggravation would be avoided. In contrast, a pain stimulus would only reinforce
the aggression of the animal by subjecting it to a negative experience whenever an intruder comes near its territory. Again, electric shock collars should be discouraged whereas citronella spray collars represent useful devices, especially for companies like the Postal Service (see "Disruptive stimuli: definition and application in behaviour therapy", Proceedings of the CATBSG International Meeting, April 1997).

2.5 Comparison of efficacy

The only results of comparisons of efficacy that are valid from the scientific perspective are those of a study carried out at Cornell University (New York State, USA) in 1995 by Dr. Soraya V. Juanbe-Diaz, under the supervision of Dr. Katherine Houpt (Head of the Department of Behavior). This study compared the efficacy of a citronella spray collar (Abolstop, market price $149) with that of an electric shock collar (Bark Diminisher, Model DB11, market price $145). A small number of cases were selected in order to exclude dogs suffering from social phobias or compound behavioral problems (3 or more problems). Collars were randomly assigned with each dog wearing each of the two collars for a period of two weeks separated by a period of one week with no collar (cross-over protocol with a one week flushing period).

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<tr>
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<th>cases</th>
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<tbody>
<tr>
<td>Abolstop</td>
<td>6 - significant reduction in barking</td>
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<tr>
<td></td>
<td>1 - some reduction in barking</td>
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<tr>
<td></td>
<td>1 - no effect</td>
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<tr>
<td>Bark Diminisher</td>
<td>2 - significant reduction in barking</td>
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<tr>
<td></td>
<td>2 - some reduction in barking</td>
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<td>4 - no effect</td>
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Although these results are not statistically significant, they nevertheless correspond to results obtained in a trial involving 200 dogs (observed efficacy of the spray = 80%).

Furthermore, this study has the advantage of being practical; it also gives a preliminary idea of the level of consumer acceptance. The great majority of consumers express a strong preference for the citronella spray collar to the electrical collar in terms of efficacy and harmlessness.

3. Ethics of behaviour-modification devices

With respect to both moral and professional responsibility, the marketing of such devices poses a real problem for the veterinarians who wishes to provide a fast and effective
response to the needs of his clients. These devices must be judged on their scientific merits rather than on commercial or technological considerations. After all, an electric shock is still an electric shock even if it is called a "pulse" or a "stimulus". Even the principle itself of resorting to a pain stimulus is debatable at both the scientific and moral levels.

It is absolutely essential that the sale of anti-barking collars be associated with the advice of a specialist.

Only veterinarians are in a position to recognise the contraindications, to avoid abusive use and to detect potential adverse side effects. Beware of devices that can be obtained without the least precautionary advice on how to use them.

The image of electrical collars is at odds with the image of veterinarians as "friends of animals" and damages the perception of the profession.

Organisations dedicated to the protection of animals strongly disapprove of the use of electrical collars. Only citronella spray collars have been endorsed by animal protection organisations. The French S.P.A. (Society for the Protection of Animals) has set up a lending service for collars which thereby cuts down on the number of dogs abandoned as a result of barking problems.

Conclusions

Electrical devices should be prescribed only after serious consideration since they have not yet been demonstrated as either effective or harmless. In certain cases they are definitely contraindicated and it is often (tragically) with problem animals that they are used. In actual practice, consumers start with a citronella spray collar (cheaper and more respectful of the animal) and, in 80% of cases, are satisfied. Unfortunately, in the remaining 20% of cases (pathological cases), they resort to electrical collars when the treatment of symptoms has failed. They should definitely be convinced not to do this: any accident will be the responsibility of the veterinarian.

With respect to the citronella spray collar, this is a first line treatment without any associated danger and which, in 80% of cases, leads to fast resolution with no adverse side effects. If this strategy proves ineffective, it will be necessary to conduct a thorough analysis of the dog's behaviour in order to detect any underlying problems and to correct them.

As a result of recent developments in the science of ethology, there are means of modifying undesirable behaviours other than those based on administering pain. Studies on disruptive stimuli are currently leading to a new generation of behaviour-correcting products being designed which bring together four essential elements:

- efficacy
- absence of any danger
- painlessness
- respect of the animal

Use of electrical collars should be limited to specialists who alone are able to define indications and how such collars should be used. This discussion can be extended to radio controlled collars which have an enormous potential for abuse. Poor timing of the administration of shocks is entirely counterproductive and can even be dangerous for the emotional stability of the dog. Unfortunately, this occurs when such devices are commercially available to dog-owners (as opposed to specialists) and fall into the hands of irresponsible owners.