

Reference Point

A review of medically unnecessary surgeries in dogs and cats

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In ancient Rome, during the First Century CE, Lucius Columella wrote that it was proper to remove the tails of puppies to prevent their growth to an “abominable length” and to prevent madness, which is presumed to refer to rabies.¹ Although the idea that this procedure could protect dogs against rabies has long since been abandoned, tail docking is still commonly performed, both because of a belief that it reduces the incidence of injuries and because of the resulting perceived improvements in aesthetics. However, the effectiveness of this procedure in preventing injuries has been questioned, and the idea of performing this and other surgical procedures on animals solely for cosmetic reasons has been heavily criticized in many parts of the world.² In fact, some countries have passed legislation restricting these types of surgeries. While anecdotal reports suggest that certain cosmetic procedures such as ear cropping are in decline in North America, to our knowledge there are no reliable estimates on the numbers of these procedures performed annually.

Most surgical procedures performed on dogs and cats in North America are performed for therapeutic, diagnostic, or preventive purposes; that is, they are medically necessary. In contrast, procedures that are not necessary for maintaining health or that are not beneficial to the animal can be classified as MUSs. This would include procedures performed mainly to alter the appearance of animals (eg, ear cropping and tail docking in dogs), procedures performed solely to prevent behaviors that are destructive or annoying (eg, devocalization and defanging in dogs and onychectomy in cats), and procedures of dubious or minimal benefit (eg, dewclaw removal in dogs). Note that elective neutering of healthy dogs and cats has historically been performed to prevent or reduce the risk of future health problems (eg, pyometra, mammary gland neoplasia, and reproductive tract-related neoplasia) and to prevent unplanned breeding, which benefits the population as a whole by reducing the number of unwanted animals.³ Thus, for the purposes of the

present review, we did not classify elective neutering of dogs and cats as an MUS, even though there is evidence that elective neutering, while decreasing the risk of certain health issues in dogs, may increase the risk of others.⁴

MUSs Commonly Performed on Dogs and Cats

Tail docking

Tail docking (caudectomy) is the surgical removal of the distal portion of the tail. In the Middle Ages, tail docking was performed on hunting and fighting dogs to lessen the risk of injury to the tail⁵ and is still commonly performed on dogs of various hunting, working, and terrier breeds. Tail docking is most often done within the first week after birth. Typically, a scissors or scalpel is used to remove the distal portion of the tail, with 1 or more sutures used to close the resulting wound. Alternatively, an elasticized band is placed around the tail, causing loss of tissue circulation and eventual death and sloughing of the tail.⁶ According to 1 study,⁶ tail docking is often carried out by dog breeders without the use of anesthetics or analgesics. Even when tail docking is performed by veterinarians, anesthetics or analgesics may not be used, with 1 study⁶ finding that only 10% of veterinarians used anesthetics or analgesics in conjunction with tail docking. Given that the use of anesthetics and analgesics in veterinary practice has increased in general since that study was published,⁷ it is possible that the percentage of veterinarians using pain management techniques in conjunction with tail docking has also increased. However, good estimates are not available.

Tail docking is sometimes performed in adult dogs because of tail injury, neoplasia, or self-trauma and in these instances would be considered a medically necessary surgery. Note that treatments other than tail docking have been described for dogs with self-trauma of the tail, including behavioral modification and pharmacologic treatment.⁸ However, the efficacy of these alternative treatments has not been examined.

One argument in favor of tail docking is that these breeds require docking to avoid future tail injury.² To

ABBREVIATIONS

CVMA Canadian Veterinary Medical Association
MUS Medically unnecessary surgery

test this theory, Diesel et al⁹ completed a case-control study of tail injuries in working and nonworking dogs with and without docked tails. Tail injuries that were reported included fractures, dislocations, lacerations, contusions, self-trauma, and neoplasia. The weighted risk of tail injuries in working dogs (0.29%) was significantly higher than the risk in nonworking dogs (0.19%), and the risk for dogs with docked tails (0.03%) was significantly lower than the risk for dogs without docked tails (0.23%). However, the overall tail injury rate was quite low, and the authors estimated that 500 dogs would need to have their tails docked to prevent 1 tail injury.⁹ A separate study¹⁰ reported similar results, with a tail injury risk of 0.90% for working breeds and 0.53% for nonworking breeds, and an estimate that 232 dogs would need to have their tails docked to prevent 1 tail injury severe enough to require treatment by a veterinarian. Recently, Lederer et al¹¹ examined owner reports of tail injuries in docked and undocked hunting dogs during the shooting season in Scotland and found that rates of injuries were higher in undocked spaniels and undocked dogs of the hunt, point, and retrieve breeds. The authors also found that the number of injuries reported for both docked and undocked hunting dogs was higher than previously reported for working and nonworking dogs. For example, 54.7% of undocked spaniels and 20.8% of docked spaniels reportedly had at least 1 injury during the shooting season. However, only 4.4% of dogs with a tail injury required veterinary treatment, suggesting that the risk of serious injury was much lower than the overall injury estimate. These results indicate that there may be some minor benefits to tail docking but likely only in particular breeds of dogs that are participating in hunting activities.

Notably, a number of dog breeds, including the Pembroke Welsh Corgi and Australian Shepherd, have a naturally occurring mutation in the *T-box* transcription factor *T* gene (C189G) that results in a short-tail phenotype.¹² In addition, a few breeds with naturally occurring short tails do not have this mutation, suggesting that there are other yet-to-be-discovered genetic factors affecting tail phenotype. Recently, selective breeding by outcrossing to a Pembroke Welsh Corgi with the natural bobtail gene resulted in the birth of Boxers with naturally short tails.¹³ Thus, it may be possible for breeds that traditionally have undergone tail docking to develop family lines with naturally short tails. Note, however, that there have been anecdotal reports that breeding for a bobtail appearance has resulted in health concerns related to deformed tails and spinal cord defects. Unfortunately, no scientific literature is available on this topic, and the extent of this problem is currently unknown.

Individuals disagree as to whether there is pain associated with tail docking. When asked about the degree of pain associated with tail docking in puppies, 82% of dog breeders sampled in Australia indicated “none” or “mild.”⁶ In contrast, the majority of veterinarians (76%) reported the associated pain to

be “significant” or “severe.” In a study¹⁴ of 50 puppies (Doberman Pinschers, Rottweilers, and Bouviers des Flandres) that underwent tail docking at 3 to 5 days of age, all puppies vocalized intensely at the time of tail amputation, indicating that the procedure was indeed painful. The authors also reported that the puppies settled down relatively quickly after the procedure, suggesting that the pain did not last long; however, puppies were only monitored until they settled, which took approximately 3 minutes, and further pain behaviors may have occurred at later time points. Despite the seemingly short duration of pain, some opponents of tail docking have argued that any pain is unjust if it is unnecessary.¹⁵

Whether tail docking can result in chronic pain in dogs has not been extensively studied. Gross and Carr¹⁶ described 5 Cocker Spaniels and a Miniature Poodle that had extensive self-trauma at the surgical site for several months up to 1 year after tail amputation and reported that application of mild pressure to the affected tail areas elicited a severe pain response. The pain in these dogs was attributed to neuroma development. Young female cattle that have undergone tail docking show increased agitation following application of hot or cold packs to the tail stub, suggesting that hypersensitive nerve bundles may be present,¹⁷ and up to 80% of human amputees report experiencing phantom pain following limb amputation.¹⁸ Thus, there is a potential for neuropathic pain in dogs following tail docking, although whether or how frequently this occurs is unknown.

Tail docking may also have detrimental effects on social communication in dogs,¹⁹ as research suggests that social communication in dogs is largely reliant on body language, with the tail playing an important role. For example, Leaver and Reimchen¹⁹ examined behavioral responses to dogs with different tail lengths by placing a remotely controlled life-sized dog replica in a park. They assessed responses to tails that were short or long and to tails that were wagging or still. Large dogs showed more caution approaching the replica dog when it had a short tail than when it had a long tail, and the authors speculated that this was a consequence of failure by the replica dog to signal. Also, large dogs approached the replica dog with a long, still tail less frequently than they approached the replica dog with a long, wagging tail but approached replica dogs with short, wagging tails and short, still tails with about equal frequency. In contrast, small dogs showed greater caution than large dogs, regardless of tail length or motion, likely because of the height difference and the small dogs’ inability to view the tail. Results of this study indicated that social communication in dogs relies on proper observation of tail signaling, suggesting that tail docking may impair social communication in dogs.

Collectively, the available evidence suggests that tail docking is unnecessary as a routine procedure to prevent injury, particularly in nonworking companion dogs; that it causes short-term pain and has the po-

tential to cause long-term neuropathic pain in some animals; and that it impairs social communication, which could lead to increased negative interactions with other dogs.

Ear cropping

In dogs, ear cropping involves reshaping the appearance of the external ear, usually by removing up to half of the caudal portion of the pinna (auricula). Following removal of the pinna, the ears are taped and splinted to facilitate healing in the desired shape. This procedure is typically performed when puppies are between 9 and 12 weeks old, after they have received their initial vaccinations.²⁰ Most often, dogs are anesthetized during the procedure and may or may not be given analgesics afterward.

Historically, ear cropping was performed to prevent ear damage during hunting or fighting, and some proponents of ear cropping continue to suggest that cropping is necessary to prevent accidental tearing of pendulous ears, particularly in hunting dogs. However, there is no evidence to support these claims, and many working breeds, such as spaniels and retrievers, have naturally pendulous ears. It has also been suggested that ear cropping reduces the risk of ear infection, as a result of less trapping of moisture and debris in the ear canal.²¹ While there is some evidence to suggest that dogs with pendulous ears have a higher risk of otitis externa, compared with dogs with erect ears, it appears that specific breeds tend to have a higher predisposition than others regardless of ear conformation.^{22,23} For example, 1 study found that otitis externa is more common in Cocker Spaniels, Poodles, and German Shepherd Dogs,²⁴ and another found a higher prevalence in Golden Retrievers and West Highland White Terriers.²³ None of these breeds traditionally have their ears cropped, and their natural ear position varies between hanging and erect. At least 1 textbook on veterinary surgery²⁵ no longer includes detailed information on ear cropping in dogs because of ethical concerns associated with the procedure, with the authors indicating their support for the AVMA position statement against this procedure.

To the best of our knowledge, there are no published studies on whether ear cropping results in acute or chronic pain in dogs, although given the length of the resulting wound, it is clear that the procedure results in some level of acute pain. However, information is lacking on common anesthetic and analgesic practices for dogs undergoing ear cropping. In addition, we are not aware of any studies on whether alterations in ear conformation influence communication with humans or other dogs.

Importantly, ear cropping is no longer taught at colleges of veterinary medicine in the United States. Thus, veterinarians performing this procedure in the future will largely be self-taught,²⁶ particularly as veterinarians experienced with this procedure retire. Some veterinarians have justified performing this procedure because of concerns that serious compli-

cations and animal welfare issues will arise if the procedure is done by unqualified individuals who are not veterinarians and do not have access to appropriate facilities, anesthetics, and analgesics.²⁶

Dewclaw removal

In dogs, the dewclaws represent the vestigial first digits of the forelimbs and, occasionally, hind limbs.²⁷ Some breeds, such as the Great Pyrenees, Bauceron, and Norwegian Lundehund, have double dewclaws on each of the hind limbs.²⁸ Dewclaw removal is typically performed within the first few days after birth, usually without anesthesia or analgesia,²⁹ but it may also be performed later in life (eg, when the dog is spayed or neutered).³⁰ Sedation and local anesthesia are recommended when performing this procedure on young puppies, and general anesthesia is recommended for older animals.³¹

The main argument in support of dewclaw removal is that it prevents injuries associated with accidental tearing of the dewclaws.²⁹ While the forelimb dewclaws are typically attached by bone, the hind limb dewclaws are often attached only by skin, which, some have suggested, makes them prone to catching and tearing. Furthermore, because there is no wear of the associated nail, regular trimming is required to reduce the chances of the nail being caught. However, to date, no research is available to determine the actual incidence of dewclaw tearing, so the true scope of this problem is unknown.

To our knowledge, the impact of dewclaw removal on the welfare of dogs has not been researched. As with any surgery, there is the potential for acute and chronic pain, but the severity of the pain is unknown.

Declawing

Declawing (onychectomy) is an elective surgical procedure that involves removal of the claws through amputation of all or part of the distal phalanx. Several variations of the procedure have been described, including removal of the entire distal phalanx with a scalpel or surgical laser and removal of all or most of the distal phalanx with a nail clipper.³² Removal of the distal phalanx with a surgical laser appears to be the quickest procedure and is associated with lower levels of postoperative stress and pain than removal with a scalpel.³³ However, it has also been associated with a higher number of postoperative complications in the days following the procedure.³³ Transection of the tendons of the deep flexor muscle (ie, tendonectionomy) is sometimes performed as an alternative to onychectomy, as it prevents extension of the claws and results in fewer signs of pain.³⁴ Both onychectomy and tendonectionomy should be performed only by veterinarians with appropriate anesthesia and postoperative analgesia.

Declawing is usually performed to prevent scratching-related injuries to people and damage to property. Recent surveys^{35,36} of veterinarians indicate that aggression and property destruction due to

scratching are frequent behavior problems reported by cat owners. Scratching of people and other animals is undesirable because of the potential for injury and infection, particularly in people who are immunocompromised. In some cases, this scratching may be intentional and related to aggression, but in others it is unintentional during play and handling. There appears to be a relatively high prevalence of aggression in owned cats, with recent research suggesting 36% of cats display aggression toward their owners³⁷ and almost 50% of cats display aggression toward either familiar or unfamiliar people.³⁸ However, although declawing will prevent scratching-related injuries, it is unlikely to resolve the problem of aggression in general owing to the potential for cats to bite as an alternative to scratching. More research is needed to identify means to prevent aggression-related behaviors by cats toward their owners.

Scratching items in the environment is a normal behavior that serves a number of functions for cats, including territorial marking and nail conditioning.³⁹ Farm cats have been reported to scratch between 1 and 6 times a day. Scratching behavior is driven almost entirely by the presence of conspecifics³⁹ but is still present in cats housed singly in homes. Although it is a normal behavior, environmental scratching is generally deemed to be undesirable by owners because it can lead to property damage. While recent estimates of the prevalence of environmental scratching are unavailable, 2 older studies^{40,41} suggest that 15% to 25% of cats show inappropriate scratching of property, with one of these studies⁴⁰ indicating that scratching might increase the risk of cat relinquishment. Although declawing is 1 method of preventing scratching damage, there are alternative methods that do not involve surgery. For example, owners can provide appropriate outlets for scratching and trim their cats' nails regularly. Therefore, when this procedure is requested, every effort should be made to educate and assist owners of cats to pursue possible alternatives that could alleviate the need for surgery.

The National Council for Pet Population has estimated that approximately 14.4 million of the 59 million cats in the United States are declawed.⁴² Similarly, a recent study⁴³ reported that 20% of cats admitted in the Raleigh, NC, area had undergone declawing or, more specifically, onychectomy. Interestingly, the percentage of cats that are declawed has apparently not changed in the past decade despite the growing controversy surrounding the procedure.⁴³ In a survey conducted by Yeon et al,³⁴ cats reportedly continued to make scratching movements following declawing, but 91% of owners surveyed had an overall positive attitude about the procedure, whether onychectomy or tendonectomy.

Various studies⁴⁴⁻⁴⁷ have demonstrated that onychectomy causes postoperative pain in cats. For example, Carroll et al⁴⁴ examined postoperative pain in cats receiving either butorphanol or no analgesia following onychectomy and found that in comparison to control

cats, butorphanol-treated cats had higher analgesia scores during the first 24 hours after surgery. Furthermore, according to owner reports, butorphanol-treated cats were more likely to eat and act normally and to have lower lameness scores during the first day after discharge. Cloutier et al⁴⁵ found that even when cats were treated with butorphanol before surgery, they had evidence of postoperative pain, as determined by comparison with control cats that underwent a sham procedure. Both of these studies involved removal of the distal phalanx with a scalpel or clipper, but recent studies assessing the effect of laser removal suggest that this procedure also results in postoperative pain, although to a lesser degree than that associated with other methods. Clark et al⁴⁶ found that cats that underwent laser onychectomy were less reluctant to jump after surgery than were cats in which onychectomy was performed with a scalpel or clipper. Similarly, Holmberg and Brisson⁴⁷ compared pain scores during the 10 days following onychectomy with either a scalpel or a laser and found that both groups had elevated pain scores during the first 9 days but that the mean score over the first 7 days was higher for the scalpel group, compared with the laser group. Finally, Robinson et al³³ assessed limb function by measuring ground reaction forces following laser or scalpel onychectomy and found that forces were reduced in both groups following surgery, but the reduction was greater in the scalpel group.

Researchers have also studied the pain associated with tendonectomy versus onychectomy, but differences between the procedures are unclear. While 1 study⁴⁸ found that tendonectomy resulted in lower pain scores, compared with onychectomy, during the first 24 hours after surgery, another study⁴⁵ found no differences in pain scores when comparing the 2 procedures. Jankowski et al⁴⁸ reported differences in postoperative complications associated with the 2 procedures. Of 18 cats that underwent onychectomy, 1 had severe postoperative pain and another had long-term lameness. Of 20 cats that underwent tendonectomy, 1 had long-term lameness, but owners of 6 cats expressed dissatisfaction with the procedure because of continued scratching and issues with claw growth and trimming.

Although both onychectomy and tendonectomy have the potential to cause acute postoperative pain, it is likely that a multimodal analgesic approach will provide adequate pain control. Although a review of all studies assessing efficacy of analgesic regimens for control of postoperative pain following onychectomy and tendonectomy is beyond the scope of the current discussion, we encourage future research to determine which analgesic regimes are commonly used in current veterinary practice and whether they are sufficient.

A number of studies have assessed short-term and long-term postoperative complication rates following onychectomy. Short-term postoperative complications following onychectomy include pain and

associated lameness, hemorrhage, swelling, infection, and changes in behavior.^{48,49} Pollari and Bonnett⁵⁰ examined the risk of postoperative complications when onychectomy was performed alone or in combination with other surgeries and reported that cats that underwent onychectomy in combination with ovariohysterectomy or castration were more likely to have postoperative complications than were cats that underwent either procedure alone. This was particularly concerning because 53% of cats underwent both procedures.

One common long-term complication of onychectomy is claw regrowth, with rates reportedly ranging from 3.4% to 15.4%, depending on the study and the method of claw removal.^{46,48,49} One study⁴⁶ found that claw regrowth was more common with use of a nail clipper than with use of a scalpel or laser (15.4% vs 6.5% and 3.4%). Other long-term complications include persistent lameness and signs of chronic pain.^{46,48,49} Clark et al⁴⁶ reported the highest rates of pain-related complications, with up to 23% of cats having ongoing lameness and 42.3% of cats showing signs of pain on paw palpation. Owners have also reported long-term behavioral changes in cats following onychectomy such as house soiling and an increased resistance to allowing the paws to be handled or an increased incidence or severity of biting, compared with behavior before the procedure.⁵¹

Alternatives to declawing include regular nail trimming and use of artificial nail caps to minimize property damage and provision of appropriate scratching surfaces such as scratching posts and substrates.⁵² A study⁵³ of 128 Italian cat owners found that sexually intact male cats were more likely to scratch other surfaces when a scratching post was absent from the environment, and Cozzi et al³⁹ reported that a feline interdigital semiochemical, a cat pheromone replacement made of fatty acids, can be used to control excess behavioral scratching through placement of this substance on a desired scratching location. Behavior modification methods may also decrease environmental scratching. Given clear evidence of pain and postoperative complications with declawing, this procedure should be considered as a last resort after all other behavior modifying measures have been attempted and when the only other alternative is relinquishment or euthanasia.

Devocalization

In dogs, devocalization (ventriculocordectomy) involves complete or partial removal of the vocal folds to prevent vocalization or reduce the intensity of vocalizations that are produced. The procedure can be done through an oral approach or by means of a laryngotomy. Anecdotally, the oral approach appears to be more commonly used in clinical practice, although laryngotomy is the recommended approach.⁵⁴ Devocalization procedures vary in effectiveness, with great variation among breeds.⁵⁴ In particularly excitable dogs, increased airflow through the larynx following devocalization can result in the ability to bark to some

degree.⁵⁴ As a result, some owners administer tranquilizers after surgery.⁵⁴

Excessive barking is seen as an undesirable behavior by owners and others affected by the barking and reportedly increases the risk of relinquishment.^{55,56} One study⁵⁶ found that excessive barking accounts for 11.3% of reported undesirable behaviors in dogs. Alternatives to devocalization are typically aimed at addressing the underlying cause of the undesirable barking. Common causes of undesirable barking include general anxiety, separation anxiety, and compulsive disorders,⁵⁷ and treatment by means of behavior modification with or without adjunctive medication should be attempted first. One study⁵⁸ found that positive reinforcement training was effective at reducing barking in response to someone knocking at the door, and dogs that are exercised more frequently are found to bark less than dogs that are not exercised.⁵⁹ While there appears to be general agreement within the veterinary behavior community that positive reinforcement is the most appropriate training method for dogs, barking is often treated through the use of methods that incorporate positive punishment. Both electric shock and citronella spray collars have been found to reduce the incidence of certain types of barking.^{60,61} However, the effectiveness of citronella spray collars is decreased when the collar is worn continuously, and a rebound effect (increased barking) is frequently observed after the collar is removed.⁶⁰ In addition, there are concerns that electric shock and citronella spray collars may cause fear and pain in dogs. One study⁶¹ found no difference in serum cortisol concentrations between dogs wearing electric shock or citronella spray collars and control dogs. However, another study⁶² found behavioral signs of fear and stress in dogs in response to use of an electric shock collar, including lowered posture, vocalizations, oral behaviors, and aggression toward the handler.⁶² In addition, when used improperly, electric shock collars can lead to burns and infections. Finally, in dogs with excessive barking, devocalization only removes the manifestation of the problem (ie, the dog is no longer being able to bark) and does not address the underlying behavioral problem, which may be negatively affecting the dog's quality of life. Thus, in dogs with excessive barking, the underlying cause should be identified and addressed before devocalization is considered.

A potential long-term complication of devocalization in dogs is formation of a laryngeal web that obstructs airflow⁶³ and may require corrective surgery.³¹ Laryngeal web formation occurs more commonly after devocalization through an oral approach, with clinical signs developing between 3 months and 3 years after surgery in 1 report.⁶³

Defanging

Defanging involves removal or reduction of the canine teeth and can be performed in either puppies or adult dogs. Although this procedure should only be performed with appropriate dental techniques, it is,

in some cases, performed by cutting or breaking the teeth near the gingival margin and may or may not involve adequate anesthesia and analgesia.⁶⁴

Defanging was originally developed to decrease the danger captive wild animals posed to humans, and similar justifications have been presented by advocates of this procedure in companion animals.⁶⁵ Although aggression can be a serious concern in certain dogs, this procedure is not fully effective at reducing the risks of biting injuries. Appropriate treatment of aggression should involve risk management and treatment to reduce the behavior problem. Although research has not been conducted on pain and behavioral effects of defanging in companion animals, this procedure is considered unnecessary when trying to prevent human-animal conflicts with exotic carnivores and similar results can be predicted for companion animals.⁶⁵

Legislation Related to MUSs

Some of the earliest legislation restricting MUSs in dogs and cats was passed in the European Union in 1987, when the European Convention for the Protection of Pet Animals was implemented. This treaty prohibits any “surgical operation for the purpose of modifying [the] appearance of a pet animal or for other non-curative purposes,”⁶⁶ which would include tail docking, ear cropping, devocalization, declawing, and defanging. Veterinarians can make exceptions to these prohibitions if the procedure is considered necessary for curative reasons or the benefit of a particular animal, or to prevent reproduction.⁶⁶ However, regardless of the reason, all surgical operations must be carried out by a veterinarian and under anesthesia if the animal is believed to be in, or have the possibility of being in, severe pain.⁶⁶ Although this convention was initially ratified by 4 member states in 1992, it is noteworthy that as of 2014 some members of the EU had yet to ratify it. In some of the countries that have not yet ratified the convention, alternative legislation restricts at least some of these procedures. For example, in the United Kingdom and the Netherlands, ear cropping, tail docking, and declawing are restricted. In addition, some countries, such as France, have ratified the convention but excluded tail docking from the list of prohibited procedures.⁶⁷

Many additional countries have incorporated MUSs into their animal welfare legislation, but recommendations vary by country. For example, declawing, ear cropping, and tail docking are restricted in Australia and Israel; declawing, devocalization, and ear cropping are restricted in New Zealand; and tail docking and ear cropping are restricted in Brazil. We are not aware of legislation in any countries that restricts surgical removal of the dewclaws in dogs.

Current Status in North America

Both the CVMA and AVMA have a number of position statements regarding MUSs. For instance, the

AVMA position statement on tail docking and ear cropping states that it “opposes ear cropping and tail docking of dogs when done solely for cosmetic purposes.”⁶⁸ The AVMA has also produced comprehensive literature reviews and fact sheets to support these position statements. The CVMA has taken a stronger stance by indicating that the organization “opposes the alteration of any animal by surgical or other invasive methods for cosmetic or competitive purposes,” which includes tail docking and ear cropping in dogs as well as cosmetic dentistry, tattooing, and piercing.⁶⁹ Although these position statements are decidedly against MUSs, they are ultimately only suggestions because these organizations have no enforcement capabilities. Indeed, veterinarians practicing in Canada and the United States are still able to perform these procedures at their own discretion, with a few exceptions. In addition, anecdotal reports suggest that some procedures, most notably tail docking, are performed by breeders without the assistance of a veterinarian. It has been suggested that some veterinarians elect to continue tail docking puppies in fear that failure to do so will result in less qualified people, such as breeders, undertaking the procedure without access to proper medical facilities and appropriate analgesics.² This concern is supported by a study⁶ that found 51% of the breeders that were surveyed were performing the procedure on their own.

The CVMA position statement on cosmetic alterations also states that the association “strongly encourage breed associations to change the breed standards” in the hopes that the number of dogs that are ear cropped and tail docked will decrease.⁶⁹ Breed standards in Canada and the United States have changed to allow showing of dogs that have not undergone ear cropping or tail docking. This is likely to have reduced the number of dogs undergoing these procedures, but relevant figures are not available. Although the Canadian Kennel Club and American Kennel Club do not encourage these procedures, they also do not specifically discourage them. The American Kennel Club, for instance, states that it endorses “acceptable practices integral to defining and preserving breed character and enhancing good health.”⁷⁰

The CVMA and AVMA also have position statements against MUSs used primarily for behavioral modification, including declawing, devocalization, and removal or reduction of the teeth.^{52,69,71,72} For example, the CVMA position statement on onychectomy of domestic cats states that the association “strongly discourages onychectomy of domestic cats for routine purposes” as it “prevents cats from expressing normal behaviors and causes pain.”⁵² The AVMA position statement echoes this message and encourages client education and other preventive measures be taken before declawing is considered. Similar suggestions for attempts at behavioral modification to prevent the problem behavior are included in the devocalization position statements of both the CVMA and AVMA. However, for each of these position statements there is

little guidance as to what attempts at alternative strategies are sufficient to justify the need for these procedures. Thus, owners with a lower tolerance for behavioral problems may elect to pursue them without first attempting alternative strategies.⁴² Notably, pursuing alternative strategies to correct behavior problems related to scratching, aggression, and barking can involve substantial time, expertise, and expense, and owners may not be willing to invest their resources in alternative strategies when a surgical option is available. Some have argued that if these procedures were unavailable, such owners might opt for relinquishment or euthanasia. However, many veterinary clinics offer declawing of kittens in conjunction with spaying or neutering as a preventive measure when scratching behavior is not yet a concern. Thus, further discussion among stakeholders to determine how best to balance these ethical tradeoffs with an aim toward reducing the number of these procedures being performed is needed.

The role of national veterinary organizations such as the CVMA and AVMA in reducing the number of MUSs that are performed should not be underestimated. In some cases, their position statements have been incorporated into regulations initiated by provincial or state regulatory bodies to restrict veterinarians from performing these surgeries. For instance, restrictions on veterinarians performing ear cropping and, in some cases, tail docking have been incorporated into the bylaws of veterinary organizations in 6 Canadian provinces (British Columbia, Manitoba, Saskatchewan, Newfoundland and Labrador, New Brunswick, and Prince Edward Island).⁷³ However, these restrictions do not apply to nonveterinarians who may be performing tail docking and dewclaw removal outside of a clinic environment. Newfoundland and Labrador is the only Canadian province that has incorporated MUSs into formal legislation. In this province, the Animal Health and Protection Act was passed in 2010, banning ear cropping in dogs for the purposes of conforming to breed standards.⁷⁴ Additionally, this province has bylaws that prohibit docking of tails in all animals except when medically necessary.

A number of similar bylaws have been created in some states within the United States, many of which are based in principle on the AVMA guidelines. Fourteen states restrict tail docking in some species; however, only Maryland and Pennsylvania restrict tail docking of dogs.⁷⁵ In Pennsylvania, this restriction is for unqualified persons performing the procedure after 5 days of age, but veterinarians can perform the surgery regardless of age.⁷⁵ Legislation restricting ear cropping of dogs is the most common in the United States, with 9 states having restrictions. In the case of Washington State, ear cropping is permitted when in line with good husbandry practices.⁷⁵ After the CVMA released a position statement in 2009 that “discourages devocalization of dogs unless it is the only alternative to euthanasia,” and the AVMA released a similar statement 4 years later, a law was passed in Massachusetts that banned this procedure.⁷⁶ Devocalization is

also prohibited in 4 other US states, unless medically necessary. In addition to state-level restrictions, municipalities have in some cases implemented bylaws restricting MUSs in animals. For example, declawing is banned in a number of municipalities throughout California.

While veterinary organizations in North America have been clear about discouraging various MUSs through the publication of position statements, their role to date has been relatively passive. In contrast, the Australian Veterinary Association actively called for a ban on tail docking in dogs starting in 2008,⁷⁷ which was in part responsible for passage of national legislation banning this procedure. This legislation ensures that no persons in Australia, including nonveterinarians, can perform this procedure. We would suggest that there may be value in veterinarians in Canada and the United States taking a similar stance in suggesting formal legislation as a method of reducing the number of MUSs in dogs and cats.

Public Attitudes Toward MUSs in Dogs and Cats

Community consensus regarding right and wrong governs the actions of society, which then forms policies and laws.⁷⁸ Challenges arise when there is disagreement among stakeholders, preventing a consensus from being reached. This is the case for many MUSs, in that stakeholders differ in what they consider to be acceptable. Given the distributed authority governing companion animal welfare regulations and legislation in Canada and the United States, it is not surprising that leadership comes in large part from the CVMA and AVMA, in combination with the Canadian and American kennel clubs and specific breed associations. Equally disconcerting is that despite the American Kennel Club stating that unaltered dogs will not be disqualified when entered into competitions,⁷⁹ many owners believe that failure to comply with traditional breed standards will reduce their dogs' chances of winning. Some organizations have argued that banning these procedures is a violation of an individual's rights. For example, the United Kingdom-based Council of Docked Breeds campaigns to protect the owner's right to choose tail docking as an option, arguing that legislating these practices removes a person's freedom of choice.⁸⁰

Social distance is defined as the emotional, psychological, and physical distance between one individual and another, typically 2 humans.⁸¹ In the past few decades, the social distance between humans and companion animals has decreased drastically. This likely accounts for the change in attitudes regarding what is acceptable versus unacceptable in relation to animal treatment, with the effect that practices that were once seen as being acceptable are now questioned.⁸¹ In some cases, language choice can be used to influence stakeholders and evoke emotion, a strategy commonly used by animal rights advocates, who employ words

such as oppression, suffering, and cruelty to appeal to human emotion.⁸² In other cases, euphemisms can be used to increase social distance and decrease empathy. Both the CVMA and AVMA have acknowledged these potential concerns in their position statements regarding declawing and devocalization by stating that owners must be educated with regards to the potential alternatives, the details of the procedure to be performed, and the potential risks. However, there are no data available to determine how often these conversations between veterinarians and owners occur or what effect they have on the owner's willingness to proceed with the procedure. Further research in this area is critical to accurately gauge current societal views on MUSs in dogs and cats.

Conclusions

We strongly believe that in a clinical setting, surgical procedures should be performed on animals only if they have or can be expected to have clear benefits for the animal or the population as a whole. At a minimum, the procedures discussed in the present review all cause some degree of acute pain and are associated with some risk of infection or other adverse effects. Society's attitudes toward dogs and cats have changed over time, likely because of decreased social distance, with the result that attitudes toward certain procedures that were once considered acceptable are now being reconsidered. In many countries, discussions among broad ranges of stakeholders have resulted in legislation banning surgical procedures that are considered elective or unnecessary.

People are willing to acknowledge that animals experience pain but do not always appear to be willing to take appropriate action to treat or prevent that pain.⁸³ This appears to be true in the case of the procedures discussed in the present review, which are known to be painful but are still commonly performed.⁸⁴ We recommend the following strategies for enacting change in Canada and the United States with regards to MUSs in dogs and cats. First, further research and education are needed on effective methods for preventing or treating the underlying behavior problems that traditionally have resulted in declawing, devocalization, and defanging. Second, further research on public attitudes toward MUSs is needed; specifically, understanding the beliefs and values held by the public must be a priority, as only then will it be possible to encourage policy and legislation that accurately reflect the views of current society. Third, veterinarians should take a leadership role in educating both owners and the broader public on the important topic of MUSs in dogs and cats.

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Correction: Compendium of Veterinary Standard Precautions for Zoonotic Disease Prevention in Veterinary Personnel

In the report "Compendium of Veterinary Standard Precautions for Zoonotic Disease Prevention in Veterinary Personnel" (*J Am Vet Med Assoc* 2015;247:1252-1277), several paragraphs at the end of Appendix 4 (Model infection control plan for veterinary practices, 2015) were mistakenly omitted. The final sections of the appendix should read as follows:

OCCUPATIONAL HEALTH

Infection control and employee health management: The following personnel are responsible for development and maintenance of the practice's infection control policies, record keeping, and management of workplace exposure and injury incidents.

Staff responsible: _____

Record keeping: Current emergency contact information will be maintained for each employee. Records will be maintained on vaccinations, rabies virus antibody titers, and exposure and injury incidents. Changes in health status (eg, pregnancy) that may affect work duties should be reported to and recorded by the office manager so that accommodations may be made.

Pre-exposure rabies vaccination: All staff with animal contact must be vaccinated against rabies, followed by periodic titer checks and rabies vaccine boosters, in accordance with the recommendations of the Advisory Committee on Immunization Practices.

Tetanus vaccination: Tetanus immunizations must be up-to-date. Report and record puncture wounds, animal bites, and other animal-related trauma. Consult a health-care provider regarding the need for a tetanus booster.

Influenza vaccination: Veterinary personnel are encouraged to receive the current seasonal influenza vaccine. The CDC website and healthcare consultation will be used for guidance (www.cdc.gov).

Documenting and reporting exposure incidents: Report incidents that result in injury or potential exposure to an infectious agent to: _____. Information will be collected for each exposure incident using OSHA forms 301, 300, and 300A. Incident reporting includes documenting the date, time, location, person(s) injured or exposed, vaccination status of injured person(s), other persons present, description of the incident, whether health-care providers and public health authorities were consulted, the status of any animals involved (eg, vaccination history, clinical condition, and diagnostic information), first aid provided, and plans for follow-up.

Staff training and education: Infection control and hazard awareness training and education will be documented in the employee health record.

Pregnant and immunocompromised personnel: Pregnant and immunocompromised employees are at increased risk from zoonotic diseases. If you are concerned that your work responsibilities may put you at increased risk, inform: _____ so that preventive measures may be taken (such as increased use of PPE) and other accommodations may be made. Consultation between the supervising veterinarian and a health-care provider may be needed.

ADDITIONAL INFORMATION

The following information is attached to the infection control plan:

- Emergency services telephone numbers—fire, police, sheriff, animal control, poison control, etc
- Reportable or notifiable veterinary diseases and where to report
- State department of agriculture or board of animal health contact information and regulations
- State and local public health contacts for consultation on zoonotic diseases
- Public health laboratory services and contact information
- Environmental Protection Agency—registered disinfectants
- Occupational Safety and Health Administration regulations
- Animal waste disposal and biohazard regulations
- Rabies regulations
- Animal control and exotic animal regulations and contacts
- Other useful resources

Note that a modifiable electronic version of the model infection control plan is available on the National Association of State Public Health Veterinarians website (www.nasphv.org).