THE DEBATES SWIRLING AROUND MICROCHIPPING OF ANIMALS

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Microchipping of companion animals is a topic that reflects several heightened issues the United States and the rest of the world are wrestling with these days, including regulation, guardian's rights and the animal's health.

Implanted microchips emit radio frequencies upon scanning the area that convey an identification number. If the frequencies between the scanner and the chip do not match, the probability exists that the scanner will not pick up the chip's frequency. Universal scanners do exist, but these are not 100% guaranteed. Per one study, three of four universal commercial scanners tested had sensitivities ≥ 88.2%.

In fact, numerous variables exist that could impact proper detection. These include: the chip or scanner fails to transmit any signal, the scanner or chip is intentionally incompatible, the scanner will not detect the chip, the scanner will detect but not read the chip, scanning technique, or lack of registration by the pet caregiver.

While we cannot control all variables, the American Veterinary Medical Association (AVMA) points out that several countries around the world have enacted laws stating that the chips and the scanners should meet the International Standards Organization (ISO) standards: 11784, chip; and, 11785, scanner. The ISO approved frequency is 134.2-kHz. Additional language attached to the standards include a unique 15-digit identification number assigned to each companion pet as well as other requirements.

In 2005, the United States federal government considered mandating national standards for pet microchips and scanners. The AVMA article states, "In July 2007, the U.S. Department of Agriculture Plant Health and Inspection Service (USDA-APHIS) released a report to Congress regarding microchipping of pets in the United States. Because the Animal Welfare Act does not authorize the USDA-APHIS to regulate private pet ownership, the organization concluded that it cannot mandate a national standard for pet microchips or scanners."

As of 2017, non-ISO scanners and chips at 125-kHz and 128-kHz frequencies are still available for sale in the U.S. So, we are not assured of the higher compatibility between the transponders that an ISO standard would alleviate. Inevitably, the task to endorse, advocate and communicate ISO recommended standards and a central database portal have fallen to the AVMA, American Animal Hospital Association (AAHA) and World Small Animal Veterinary Association (WSAVA).

Additionally, transponder manufacturers maintain independent registry databases. AAHA has taken an additional step to help identify a participating registry by creating the website, http://www.petmicrochiplookup.org/.

Please bear in mind that a law about a standard is not the same as a compulsory microchip law for companion pets. Although several countries have compulsory laws, the U.S. federal government does not have a compulsory microchip law. States, counties or municipalities may have such laws to some degree. For instance, a state may have a law that companion pets adopted from a shelter must be microchipped. Please check with your local shelter or veterinarian on microchip laws in your area.

Nonetheless, if you choose or are required to have your companion dog or cat microchipped – AND they become lost – it could mean life or death due to transponder failure or miscommunication. Clearly, this is a health and survival concern.

On the other hand, pet caregivers are becoming increasingly concerned about health problems that may arise from implantation. For instance, incorrect implantation can cause life-threatening conditions such as tetraparesis (weakness/paralysis of all limbs) and tachypnea (increased breathing rate). The AVMA supports the WSAVA's recommendation on implant site and that only a licensed veterinarian performs the procedure or it is placed under the supervision by a licensed veterinarian. My views concur.

Cancer also poses a concern with microchips. Thus far, to my knowledge, there are no documented reports of microchips leaching toxins into the bloodstream. However, laboratory studies have found a range of 0.8-12% cancerous tumors in laboratory rats and mice, at the implantation site or around the microchip. Remember, though, that mice and rats could behave quite differently than cats and dogs, and certainly are smaller species. We know that rodents have a higher propensity to develop sarcomas of some sort around any implantation site.

But, indeed, cancerous tumors have been found near, attached to or encapsulating microchips in dogs and cats. The attempt, however, to create a direct link between microchips and cancer in dogs and cats has been problematic. The biggest variable is vaccines because they, too, are injected in the same region as microchips and can cause similar tissue reactions including sarcomas. Case in point, vaccine-associated sarcomas are common in cats. Inevitably, we are left with the question, "Is it the microchip, the vaccine or a combination?"

Overall, the number of reports amount to only a handful. Could potential microchip-associated tumors or lumps be underreported? Most definitely so. Upon review of the reports, most of the dogs and cats were generally older. We know that any foreign substance inserted into the body for long periods of time can cause neoplasms to form. So, perhaps we may want to consider excising the chip once our companion pets reach senior citizen status.

One six-year study on nine dogs with microchips revealed unchanged fibrous capsules from year one to year six. Bear in mind though that fibrous capsules normally form around microchips.

The more immediate and important concern in my mind is microchip migration. Some have entered body cavities. One microchip actually pierced a dog's heart. Thankfully, it was removed safely by a veterinary surgeon.

Adverse Events Statistics

Instead of reviewing anecdotal incidences regarding microchip migrations and cancer, please read the "Microchip Adverse Event Reporting Scheme Review from Voluntary to Compulsory Reporting April 2014 through December 2015", published by the Veterinary Medicines Directorate of the United Kingdom.

For context, a law was passed in England that all dogs must be microchipped starting April 6, 2016. Wales and Scotland introduced similar legislation at the time. Northern Ireland already had compulsory microchipping laws. This law is very comprehensive and considerate of all parties. Even though a dog must be microchipped, all adverse events (failures, migrations, reactions) **must** be reported. Additionally, a pet caregiver can ask for a medical exemption.

The review provides a good baseline of adverse events, but does not provide the counter-balance of total number of implanted microchips for the entire animal population. It is estimated that 8.5 million

cats and 7.5 million dogs live in the UK. Other incomplete information is when implantation had occurred for the majority of companion pets that had an adverse event. The authors of the report admit that these are drawbacks.

Another flaw with the review is when two adverse events were occurring at the same time. If it is a reaction ***and*** a migration or failure, it is categorized as a reaction. While a reaction is an empirical finding, when a migration ***and*** a failure occur, the review considers this to be a failure – which is a flawed decision in my view.

In any event, let's look at the statistics.

1,420 adverse events were submitted during the time frame of April 2014-December 2015. Please bear in mind that some of the reports were historical. 1,195 reports related to dogs, 219 to cats, four to rabbits, a horse and a tortoise.

39 adverse reactions were reported for dogs; 35 of those reported lumps at site implantation and 5 reports included details on vaccinations.

21 cats had adverse reactions and 11 of those developed lumps.

630 failure reports were received. The authors of the review account for any incomplete information that they received. For example: in 538 of the cases, the scanner was working, a full body scan was done, but the presence of a chip was not confirmed by another means such as palpation or imaging. At the end of the day, they determined that only 56 (less than 9%) were truly chip failures. 39 cases had medical records of implantation date and the failures occurred 3-4 years after said date.

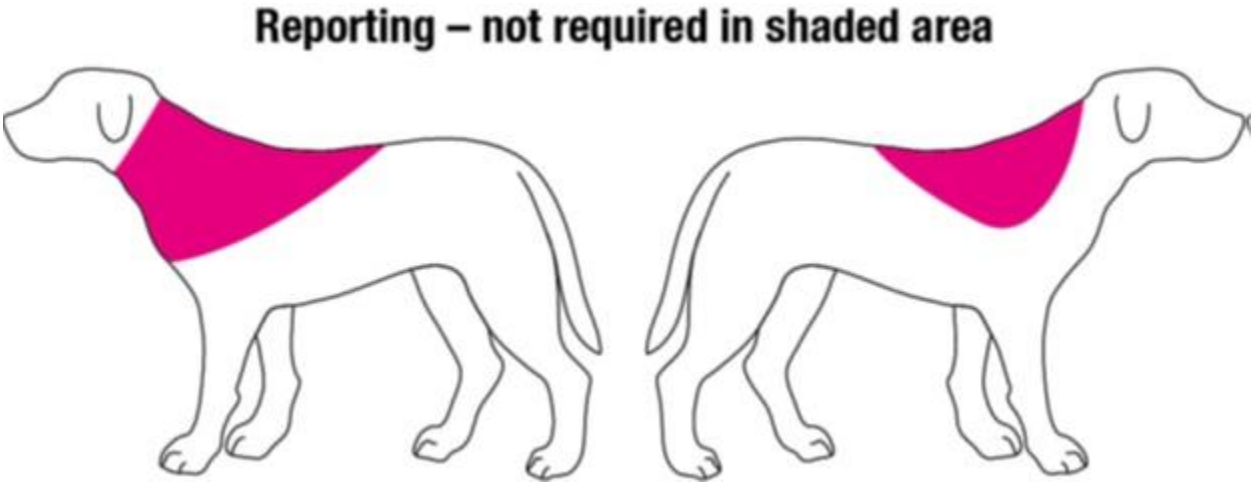
Migration reports are fascinating. Please remember, too, that several migrations might be categorized as a failure.

- 729 reported migrations in dogs, cats, a rabbit and a tortoise.
- 300 cases were dismissed because of being considered in the allowable migration zone as shown in the figure below.
- 302 reports of true migrations. The furthest migration was to a dog's left groin.

Yes or no to microchipping?

You always have the option to forego adopting a pet if the law in your state or municipality requires microchipping. However, this poses a dilemma as you need to balance the potential risk of losing an unidentified pet with the potential adverse events from microchipping. An alternative option is to tattoo your phone number on a non-removable tissue like the inside of the back leg. If your pet has distinguishing physical features, you also can photograph all four sides and the top to allow for identification on flyers, by e-mail, and upon his/her retrieval.

If your companion pet does have a microchip, please have a full body and properly performed scan completed every time you visit your veterinarian.



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