

# THE WORLD OF HURT

by Sue M. Copeland



**Does your German Shepherd Dog feel pain differently than your neighbor's Maltese? A groundbreaking study funded by the AKC Canine Health Foundation may soon have the answer.**

OUCH you cry when you touch something sharp or hot. “If you make contact with something that hurts you, you pull away your hand,” says Margaret E. Gruen, DVM, MVPH, PhD, DACVB, Assistant Professor of Behavioral Medicine at North Carolina State University’s (NCSU) College of Veterinary Medicine. “If the contact results in a wound, pain makes you more likely to care for that hand. Functional pain protects your body and promotes healing.”

You can verbalize the level of pain you experience to other people, and to your doctor. While some of us may seem more stoic than others, studies show that humans tend to feel pain at the same level.

“If you use objective data, humans are all just as sensitive as each other to pain,” says Duncan X. Lascelles, BSc, BVSc, PhD, FRCVS, CertVA, DSAS(ST), DECVS, DACVS, Professor of Surgery and Pain Management at NCSU.

But what about your dogs? They can’t verbalize the pain level they feel when sick or injured—it’s up to you and your veterinarian to try to figure it out. You’ve likely known breeds that seem more (or less) sensitive to pain than others. You may have heard other breeders, owners, or veterinarians suggest the same.

So engrained are these perceptions that Dr. Gruen did a survey in 2020 to look at how people rated pain sensitivity between different dog breeds.

“I showed about 1,000 general-public members and 1,000 veterinarians photos of dogs of a variety of breeds and asked them to rate the breeds on a pain sensitivity scale from not at all sensitive (low), to the most sensitive imaginable (high),” she said. “The responses showed both groups strongly endorse differences in pain sensitivity between dog breeds. In the public cohort, it tended to be based on size, with large breeds perceived to be less sensitive than

smaller ones.”

“On the veterinary side, the pattern was different,” she continues. “Breeds that were rated by the public as having low pain sensitivity, such as the German Shepherd Dog and Siberian Husky, were rated as highly sensitive by veterinarians. Variance in the veterinary community was low. Not only did they generally have the opinion that Labrador Retrievers, Staffordshire Terriers (or Pit Bulls), and Golden Retrievers had low pain sensitivities, they also were consistent in thinking that, for instance, Maltese and Chihuahuas were highly sensitive.”

And that raised a question. “Are those perceptions picked up in veterinary school?” Dr. Gruen asked herself. “Or are they based on experience?” That question sparked a quest to find the answer using groundbreaking, data-based research funded by AKC Canine Health Foundation (CHF). Dr. Gruen is the study’s principal investigator, with Dr. Lascelles her co-investigator.



Rachel Caddiell (left) and Rachael Cunningham, DVM perform Quantitative Sensory Testing on “Eve,” a Golden Retriever, as part of the study. The sensory tests will help the research team try to determine whether pain sensitivity varies between different breeds. (Photo by John Joyner/NC State Veterinary Medicine.)

## THE GOALS

“Let’s say the study shows there are breed differences in pain sensitivity,” says Dr. Lascelles. “We can then delve into why those differences exist. We may uncover information that will show us ways to treat patients more effectively in an individual way.”

Another question is whether the pain perceptions are related to the pain itself—or based on a specific breed’s behavior traits. If it’s the former, it raises the question of whether pain sensitivity between breeds is genetic in origin.

“That’s part of what we’re going to explore using some of the study data,” says Dr. Lascelles. “If there are differences, what are the drivers to that? Is it some behavioral attribute in that breed? Is it genetic? Answering those questions may well lead to novel ways

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to control pain. Let's say one breed is a lot less sensitive to pain than another. Diving into the genetics, you find that's due to a particular pain receptor that's different between those breeds. That opens the door to developing a therapeutic approach specific to that breed's needs."

He continues, "If, on the other hand, you find a particular behavioral attribute that's driving the difference, maybe you can harness modulation of that behavior to allow us to better treat that dog's pain."

"But," he says, "if we find there aren't inherent differences to exactly the same pain stimuli, we need to tackle those preconceptions ASAP, because they're going to affect a canine patient's treatment and pain management."

### THE STUDY

The two-year study is a first in veterinary research (CHF Grant 02797: Do Dog Breeds Differ in Pain Sensitivity – [www.akcchf.org/research/research-portfolio/2797.html](http://www.akcchf.org/research/research-portfolio/2797.html)). Dr. Gruen and her team recruited adult dogs from 10 different breeds, with about 15 dogs from each breed; the dogs were privately owned and from the NCSU area and beyond.

The breeds were grouped by perceived pain sensitivity: HIGH - Chihuahuas, German Shepherd Dogs, Maltese, Siberian Huskies; MEDIUM - Border Collies, Boston Terriers, Jack Russell Terriers; and LOW - Golden Retrievers, Labrador Retrievers, Staffordshire Terriers.

Each dog was examined by a veterinarian to be sure he or she was in normal health and free from joint or other pain. Each was also evaluated from a behavioral/cognitive standpoint, to be sure he or she was comfortable in the study setting, and with the research team conducting the study.

Step one was Quantitative Sensory Testing, which is used on people and a variety of species to look at pain thresholds. It asks the question, "At what threshold do you tell me to stop doing what I'm doing?"

Dr. Gruen's team used three types of sensory tests: a small-point pressure test, a blunt-point pressure test, and a mild heat test. A small area of fur was clipped from each dog's front and hind legs, then the pressure or mild heat was applied. As soon as the dog pulled the leg away, the pressure or heat stopped. Researchers recorded how long the dog tolerated each sensory test, and how many grams of pressure he or she tolerated.

That was followed by play time, during which the team conducted two emotional reactivity tests to learn something about each dog's reaction to new and different stimuli, which could contribute to his or her perceived pain sensitivity in a clinical setting. One was a "stranger" test, in which a person the dog didn't know, who was dressed oddly and talking loudly, approached the dog, whose reaction was recorded. The second was an animatronic monkey toy that the dogs had never seen before. The researchers recorded how long it took each dog to approach the monkey and assigned a subjective score to each dog's response.

To add to the data, Dr. Gruen's team also reviewed the records of about 4,400 dogs that went through NCSU's veterinary emergency department for information on their pain assessments. "We did that to analyze whether dogs of different breeds who came in with a particular presentation were given different pain scores by



Research team member Rachel Caddie works with Eve during her behavioral/cognitive evaluation. Each dog also got plenty of playtime between testing sessions, as well as free physical exams. (Photo by John Joyner/NC State Veterinary Medicine.)

the attending veterinarian," explains Dr. Gruen. "In other words, do we see any systemic differences in the pain scores that were given to a Golden Retriever who was hit by a car, versus a Maltese who was hit by a car?"

### THE DATA

"We're currently analyzing the data," says Dr. Gruen. "We have a lot of it, so it's taking a lot of time." But she says they're starting to see some interesting results. "There do seem to be some pain sensitivity differences by breed, but it's too early to quantify that. What's interesting is that in the Quantitative Sensory Testing, those differences aren't what we'd have predicted based on our survey with the public and with veterinarians. For example, German Shepherd Dogs appear to have pretty high pain thresholds, and that's not what we saw in our survey. And that makes you think, 'What is it that makes people say those dogs are more sensitive to pain? Is it behavior? Is that a breed that's prone to being more tense, or anxious? Do we need to do more to manage them from a behavioral standpoint, rather than simply giving them pain meds?'"

She continues, "Maybe we'll come up with more questions than answers. But if we find strong differences between breeds, that becomes an interesting question about the need to understand more clearly the genetics of pain. And then start a move toward a more individualized pain-management approach based on breed."

Adds Dr. Lascelles, "We are incredibly grateful to the AKC Canine Health Foundation for funding this work, which we believe is important. We were able to hire some incredible people to help with the research, even in the middle of a pandemic, and gather data on 180 dogs in one year. We are really excited with the study."

"The AKC Canine Health Foundation and its donors are committed to funding groundbreaking research such as this study on breed differences in pain sensitivity," says Dr. Darin Collins, CHF Chief Executive Officer. "As the field of veterinary pain management continues to evolve, results from this study have the potential to improve pain control and quality of life for all dogs."

To learn more about Dr. Gruen's research, watch the CHF-sponsored webinar, "PAIN SENSITIVITY IN DOGS OF DIFFERENT BREEDS: WHAT DO WE KNOW, AND WHAT DO WE BELIEVE?", available August 10, 2022 at [akcchf.org/vetvine](http://akcchf.org/vetvine). 🐾