

Dogs Achieving Astonishing Things With Their Sniffers

Dogs' noses are 10,000-100,000x more powerful than humans', giving them an astonishing ability to detect changes in odors. Dogs are now using their noses to help humans, from detecting multiple different diseases to alerting people with life-threatening medical conditions.

Analysis by Dr. Karen Shaw Becker

STORY AT-A-GLANCE

- The Austin Firefighters Association has partnered with CancerDogs to get firefighters regular cancer screenings
- Dogs specially trained to sniff out cancer from breath samples can detect cancer with more than 60% accuracy
- Dogs can also be trained as medical alert assistance dogs, which work with people with diabetes, severe allergies, Addison's disease and other life-threatening health conditions
- Dogs can even be trained to sniff out gluten, which can be a game changer for people with the autoimmune disorder celiac disease
- Dogs were able to detect 70% of children infected with malaria and 90% of uninfected children, just by smelling their socks; dogs may represent a noninvasive and rapid way to detect malaria

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It's hard to imagine what it would be like to have the keen sense of smell enjoyed by your dog, as even the most sensitive of human sniffers has only about 6 million olfactory receptors — compared to up to 300 million in dogs. That gives dogs a serious edge when it comes to scent, such that they can detect certain odors in parts per trillion.

It's still hard to put this into concrete terms, but some dog scientists have tried. Alexandra Horowitz, a dog cognition researcher, explained that while humans can detect 1 teaspoon of sugar in a cup of coffee, a dog could detect that same amount of sugar in two Olympic-sized pools of water. Another scientist suggested that dogs could sniff out one rotten apple out of 2 million barrels.¹

All that being said, a dog's sense of smell is 10,000 times to 100,000 times more sensitive than humans',² and this gives them some remarkable abilities. From sniffing out medical conditions ranging from cancer to allergies to detecting malaria parasites — and possibly helping to eradicate the disease — dogs can do truly astounding things with their sniffers.

'Cancer Dogs' Sniff Out Cancer in Firefighters

Firefighters risk their lives to save others, not only while they're actively battling fires but also because they're exposed to more carcinogens than the average person, due to the toxic smoke and other chemicals released during fires.

As such, firefighters are at an increased risk of cancer, which is why the Austin Firefighters Association is partnering with CancerDogs to get firefighters regular cancer screenings. All the firefighters have to do is breathe into a mask and bottle for 10 minutes. Dogs specially trained to sniff out cancer from breath samples can then detect cancer with more than 60% accuracy.³ CancerDogs explains:⁴

"CancerDogs is a cancer screening service that uses specially trained dogs to detect the odor of all types of cancer present in a person's exhaled breath. We developed an inexpensive and [noninvasive] breath sample kit that collects breath odor with a simple surgical mask that is worn for 10 minutes.

Back at our facility, the breath samples are processed, placed into trays and loaded into our custom designed sniffing station where [four] dogs will systematically search, sniffing each sample multiple times."

As of January 2018, 30,000 firefighters have been tested as part of CancerDogs' Firefighter Cancer Screening Trials. Although the screening is considered experimental and not a replacement for standard medical care, the hope is that dogs can help the firefighters detect cancer earlier, leading to more successful treatment.

Ultimately, it's hoped that dogs may one day be able to detect cancer in the general public as well. Already, so-called bio-detection dogs are being trained to provide diagnostic support for difficult-to-diagnose cancers such as prostate cancer, as well as to detect the odor of volatile chemicals in urine, fecal and skin swab samples that may correlate with different illnesses ranging from cancer to malaria to Parkinson's disease.⁵

Medical Detection Dogs Can Alert You of an Oncoming Medical Emergency

Dogs can also be trained as medical alert assistance dogs, which work with people with diabetes, severe allergies, Addison's disease and other life-threatening health conditions. They can detect subtle changes in blood sugar levels and hormones that indicate a medical emergency may soon occur. The dogs then alert their owner and even call for help and gather medical supplies.⁶

The charity Medical Detection Dogs trains dogs to detect human disease and help their owners manage health conditions. Although most of their clients have diabetes and rely on their medical detection dogs to detect minute changes in blood sugar levels, the dogs can also help with other medical conditions like Postural Tachycardia Syndrome (PoTS).

People with PoTS may suffer from dangerous blackouts, but the dogs can alert them and bring them to safety before they fall unconscious. In the case of Elizabeth, a young woman with PoTS, having Henry, a medical detection dog, has been life-changing. According to Medical Detection Dogs:⁷

"Henry has exceeded all the expectations Elizabeth ever had of him and he has changed her life immensely! Elizabeth now feels so much safer, much more confident and a whole lot happier with him by her side.

He has allowed her to confidently go back to judo and go back to university to continue her studies in animal science, so she can finally pursue her dream to be a veterinary physiotherapist. He's taken away the fear from Elizabeth's family and she cannot picture life without him, as he has brought so much light into so much darkness."

Dogs can even be trained to sniff out gluten, which can be a game changer for people with the autoimmune disorder celiac disease. If gluten is consumed, it causes an immune response that damages the small intestine, causing impaired nutrient absorption and a host of other debilitating symptoms.

Gluten-sniffing dogs may detect gluten in amounts as small as 0.0025 parts per million with 95% to 98% accuracy.⁸ For those with celiac disease, like 6-year-old Toby of Oregon, the added protection allows for freedom and growth. Toby's mom told WTVR News:⁹

"We've really seen just growth and development in him because he's not getting sick as often and he's now able to learn more ... So he can now say his alphabet, learn his numbers and colors, things that just a year ago he wasn't doing ... She's [Toby's service dog] a life-giver ... Yeah, she's breathed life and confidence into Toby that we haven't seen in a really long time."

Dogs' Sniffers Can Even Detect Malaria

Dogs are able to detect drugs, food and diseases, so it's not a stretch to believe they could detect malaria as well. Indeed, dogs trained by Medical Detection Dogs can even tell the difference between socks worn by someone with malaria and those worn by someone without the disease.

Two dogs were able to detect 70% of children infected with malaria and 90% of uninfected children, just by smelling their socks,¹⁰ according to research presented at the 2018 meeting of the American Society of Tropical Medicine and Hygiene.

The dogs may represent a noninvasive and rapid way to detect malaria, which could be especially useful at ports and airports, particularly at entry points to countries where the disease has been eliminated. Similar to the way dogs are used to sniff for drugs and other contraband, they may be able to detect malaria in people or clothing, helping to keep the disease from spreading to malaria-free regions.

The many ways dogs are able to help humans is truly extraordinary, including the powers of their incredible noses. Even if your dog isn't specifically trained to sniff out cancer or malaria, you can still cater to her nose by getting involved in **K9 nose work**, a fun recreational activity for dogs and their owners.

K9 nose work encourages your dog's natural drive to hunt, coupled with her natural instinct to hunt and track scents. You'll likely find that even pet dogs have an astonishing ability to pick up scents and find their source.

Sources and References

^{1, 2} [PBS October 3, 2012](#)

³ [KVUE November 13, 2017](#)

⁴ [CancerDogs.ca, About Us](#)

^{5, 6} [The Telegraph August 21, 2018](#)

⁷ [Medical Detection Dogs Elizabeth & Henry](#)

⁸ [The Washington Times March 22, 2017](#)

⁹ [WTVR July 17, 2018](#)

¹⁰ [CNN October 29, 2018](#)
