

**Nominee Information:**

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Name: Ms. Allison Muniak

Title: Executive Director, Quality & Patient Safety & Infection Control

Organization: Vancouver Coastal Health

Project / Group Name (If Applicable): C. Difficile Canine Scent Detection Program

Address:

Email:

**Nominator Information:**

Name: Ms. Laurie Dawkins

Title: Director, Corporate Communications

Organization: Vancouver Coastal Health

Address:

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**Top Innovation:**

**1) Provide a brief overview of the project and/or team.**

Just about everyone knows Angus, the three year old English springer spaniel trained to detect Clostridium Difficile (CDI or C. diff) in the hospital environment – initially at Vancouver General Hospital, but also at Lions Gate and Richmond Hospitals, and most recently hospitals in BC's interior. Thanks to his super sensitive canine nose and perpetual "doggie grin," Angus has become an international media darling and a hero amongst patients and healthcare workers alike. But behind Angus stands an innovative and dedicated team of people – and a growing list of pups – known as the C. Difficile Canine Scent Detection Program. Together, they are pioneering a cost-effective and scalable method to enhance C. diff surveillance measures, improve infection control and prevention practices, reduce risk of transmission and increase staff engagement in the important work of keeping vulnerable patients safe from the life-altering impacts of C. diff infections. Team members include Dr. Elizabeth Bryce, VCH's recently retired Regional Medical Director of Infection Control; Dr. Diane Roscoe, Regional Medical Discipline Lead, Medical Microbiology; Allison Muniak, Executive Director, Quality and Patient Safety and Infection Control; Sarah Rothwell, Project Coordinator; VGH Housekeeping staff; Angus and Dodger, our two canine C. Diff detectors; and two handlers, including Teresa Zurberg, with whom the program began. VCH's C. Difficile Canine Scent Detection Program was inspired by Teresa's personal battle with CDI, which nearly cost her her life. The experience sparked her husband, Markus Zurberg, a member of the VCH Quality and Patient Safety team, to suggest combining his wife's talents as a nationally trained K-9 handler with the idea of training a dog to detect C. diff. VCH embraced the idea and the rest – rather than being history – is a bright future that continues to expand.

**2) What is the overall goal of the project and/or team? What problem or challenge is being solved and/or what need is being addressed?**

Clostridium difficile is a bacterium that causes mild to severe diarrhea and intestinal conditions like inflammation of the colon, as well as potentially life-threatening pseudomembranous colitis, bowel perforation, and sepsis. CDI is the most frequent cause of infectious diarrhea in hospitals and long-term care facilities in Canada, as well as in other industrialized countries. People can get infected if they touch surfaces contaminated with feces, and then

touch their mouth. Healthcare workers can spread the bacteria to their patients if their hands are contaminated. C. diff spores are resistant to routine cleaning agents, and, depending on the conditions, can live in the healthcare environment for many months. It is an issue that every health authority across British Columbia must contend with on a daily basis – it impacts everything from clinical care and patient flow, to housekeeping and infection control, quality and safety performance, and of course the viability of our most vulnerable patients, such as those in Intensive Care and Critical Care Units, whose lives are at risk should they experience infectious diarrhea and dehydration. Health authorities make valiant efforts to detect and eradicate CDI, but we are limited to removing only that which we know exists. Thanks to Angus and the larger C. Difficile Canine Scent Detection Program, VCH can now do vastly better; we can eliminate the hidden dangers of CDI detectable only by a canine nose and dramatically reduce the rate of C. diff transmission by healthcare workers, visitors and patients in hospitals.

How it works is simple. Angus – and Dodger, a second dog who is still in training – walk the halls of hospitals with their handlers. When the dogs detect the scent of C. diff they will sit. If this occurs, the area undergoes an extensive cleaning that may include a UV light disinfectant machine. Vancouver General Hospital (where the dogs most frequently work) has three such machines, known as R-D (Rapid Disinfectant). Clinical research has shown that the machine removes more than a 99.9 percent of C. difficile spores, so knowing exactly where to deploy them is highly effective. By tracking where the dogs detect CDI and sharing that information with infection control practitioners, clinicians, and housekeeping staff, the C. Difficile Canine Scent Detection Program provides VCH with valuable, actionable data that previously did not exist. Many departments within VCH are already using this data to improve their infection control practices, and there are plans to roll out additional quality improvement initiatives in the immediate future. We expect these interventions will prevent environmental contamination from occurring in the first place – which will result in improved health for our patients and staff, as well as potentially reduce lengths of stay and reduced readmission rates right across the health authority.

**3) How has the project and/or team demonstrated excellence, leadership, innovation and leading practices? Has it inspired other? Will it add value across the health care system? Please provide specific examples.**

The C. Difficile Canine Scent Detection Program began as a pilot project at Vancouver General Hospital in 2014. Angus passed the testing required for him to become a working dog in 2016, and henceforth was considered “certified” to detect C. diff in the environment. Soon after, Angus and his handler, Theresa, got their VCH ID badges and began working at VGH, but it has been over the past year (2017) that VCH has really set to work in earnest on expanding the overall program and sharing all that we have learned about the presence and eradication of C. difficile in health care settings.

While Dodger continues his training at VGH, Angus is currently “on tour” and visiting a number of hospitals in Interior Health (<http://www.vch.ca/about-us/news/news-releases/angus-hits-the-road-to-detect-c-difficile>), allowing other health care professionals to see and experience first-hand how innovative and efficient the program is. VCH hopes to do more of this in the future, contracting out Angus to additional hospitals, and eventually developing a certification program for C. diff detection dogs. Work is underway on a manual to support this program, which would stand to benefit the health care system overall. Part of what makes the program so effective is the immediacy of the impact. The moment Angus or Dodger make a detection, it is visible to staff and they can do something about it; this is a learning and life-saving initiative that unfolds real-time. Staff want to be involved – in part because they adore the dogs and welcome their visits – but also because they can see exactly how they are making a difference.

It's empowering. The program engages staff in the work of quality improvement, resulting in both ground-up and systemic opportunities for collaborative problem-solving in support of improved infection control and patient safety.

Nothing speaks louder to the power of this program than two real life examples related to staff engagement and patient safety: One day at VGH, Angus made an alert to the presence of C. Diff on a supply tray on top of a respiratory stand. The Respiratory Therapist took the information back to her team. A team huddle was conducted and together, the team decided to remove all trays. They have had no further alerts since. A VGH physician asked one of the canine handlers to search the room of a patient who had recovered from CDI and was about to be discharged home. C. diff was on the patient's wheelchair and handbag, which could have led to community contamination. The patient's belongings were cleaned and disinfected, and the moment led to a bigger conversation amongst staff and physicians about how to improve patient discharge practices.

**4) Has the project and/or team achieved its goals? How has care for individuals been improved?  
Please provide specific examples of results.**

The C. Difficile Canine Scent Detection Program has been an overwhelming success in terms of quality improvement, collaboration across teams and units, and overall staff engagement in quality and patient safety. One of the most important measures, however, has been the reduction of CDI rates at Vancouver General Hospital. PICNET data shows a CDI rate of 5.9 per 10,000 inpatient days in Q4 2015-2016 fiscal, compared to the current 3.4 for hospital acquired CDI. This is the end result of not just Angus, Dodger and their handlers, but more vigilant housekeeping, increased awareness, and staff surveillance. A renewed, collaborative approach to infection control and quality care is helping the program thrive, while keeping patients healthier and saved VGH the equivalent of 186 bed days in its first year.

In practical, hands-on terms, this is what success looks like: Between November 1, 2016 and December 31, 2017, the canine detection team completed over 400 searches at VGH, of which 23% of the searches resulted in one or more contamination alerts – meaning C. diff was found. (Findings have been validated through research and evaluation.) Contamination was most commonly found in CDI patient rooms, and high risk areas like the Intensive Care Unit. There were also a high number of alerts in communal areas such as shared bathrooms, hallways, and shared shower rooms. High-touch surfaces, such as hand washing sinks, toilet paper holders, and hand sanitizers, were also routinely identified as sources of contamination. Angus also identified less-predictable sources of contamination such as staff lockers, clean medical equipment, isolation linen carts, clean supplies, and patient belongings. It is noteworthy that the program team has validated that Angus can recognize C. difficile with a sensitivity of 100% and specificity of 97%. The results and methods were published in the Journal of Hospital Infection

([http://www.journalofhospitalinfection.com/article/S0195-6701\(17\)30295-5/fulltext](http://www.journalofhospitalinfection.com/article/S0195-6701(17)30295-5/fulltext)) in June 2017. (Bryce, Zurberg, Zurberg, Shajari, & Roscoe, 2017) By evaluating the alert trends (when and where C. diff has been found), VCH has uncovered specific opportunities to improve infection control and prevention education and practices among our healthcare workers, cleaning staff, patients, and visitors. Many departments within VCH are already using this data to improve their practices, and there are plans to roll out additional quality improvement initiatives in the immediate future. It is expected that these interventions will prevent environmental contamination from occurring in the first place. Beyond the immediate impact on patient and staff safety at VGH, Angus and the C. Difficile Canine Scent Detection Program are raising overall awareness about C. difficile and the power of innovation in improving health care: Angus has his own Facebook page (<https://www.facebook.com/angusk9/>) and attracts likes and comments by the thousands each time he is profiled in media.