



Interior Search with Hospital Protocols

**K9 Scent Detection of
Clostridium Difficile on Surfaces**

Background

It is important to the future development and use of K9s in healthcare to have a high standard and specific guidelines for training, certification, and documentation required for the discipline of locating *Clostridium difficile* (*C. difficile*) on surfaces.

C. difficile is a bacterium that causes mild to severe diarrhea and intestinal conditions like inflammation of the colon. *C. difficile* is the most frequent cause of infectious diarrhea in hospitals and long-term care facilities in Canada. In some circumstances, *C. difficile* can be fatal. *C. difficile* can cause mild diarrhea, to life-threatening pseudomembranous colitis, bowel perforation, sepsis, and even death. It is a hospital acquired infection (HAI) which causes great harm.

HAIs are often associated with increased morbidity and mortality, contributing to approximately one-third of unexpected in-hospital deaths. They remain an important patient safety and quality issue, representing a significant adverse outcome of health care. In both acute and long-term care, outbreaks result in significant costs to the health care organization.

It is estimated that up to 70% of HAIs are preventable. The landmark Study on the Efficacy of Nosocomial Infection Control (SENIC) project estimated that one-third of HAIs in hospitals could be prevented if the essential components required for infection prevention and control (IPAC) programs were implemented.

There is evidence that dogs can be an asset in locating *C. difficile*. A 2012 study from Holland found that a dog could reliably discriminate the odour of *C. difficile*. For the past four years a pair of Springer Spaniels have been locating *C. difficile* at Vancouver Coastal Health.² In late 2019 our K9 team completed in-hospital training at Southlake Regional Health Centre in Newmarket Ontario and documented the team's ability to search for and locate *C. difficile* on surfaces.

This draft of Medical Service Dog Standards and Protocols is developed from lessons learned, published material, research, testing and the guidelines from the Scientific Working Group on Dog and Orthogonal Detector Guidelines (SWGDOG).

This STANDARD represents the best practice for Interior Search with Hospital Protocols.

MEDICAL SERVICE DOG STANDARDS AND PROTOCOLS

The C-diff dog is a working dog trained for the specific task of searching for and locating the target odour in contaminated areas among people with health and behaviour problems. The K9 team is usually accompanied by an Infection Prevention and Control Professional (ICP) who is responsible for the workplace standards and health practices.

Proof and Verification

The K9 standards is a protocol for training and certifying a handler and his canine. Following the training standards is a prerequisite to building trust and credibility with health care professionals.

Definitions

Definitions are from the current Infection Prevention and Control (IPAC) Program Standard, and from the Scientific Working Group on Dog and Orthogonal Detector Guidelines.

Patient safety, reducing risk, and avoiding liability

A do-not-touch-the-dog policy and three protocols have been developed to protect hospital staff and the K9 team. Any physical contact between the canine and a patient or visitor shall be recorded in an approved incident report.

For training and verification, trainers and handlers shall use a safe scent kit with the odour of NAP1/027 on cotton tips. The scent kit does not hold any pathogens which make kits safe to store, transport and use at any location. Fresh C-diff positive stool is used for confirmation of odour discrimination; however, using stool as a training aid would not be approved by the lab, the legal department, or the ethics committee.

Handler Selection

- The handler must be able to house, transport and care for a working dog.
- The handler must have the skills necessary to handle a high drive animal with regular guidance from the approved medical service dog instructor.
- The handler must be physically and mentally capable of performing the task.
- The handler must be comfortable relating to others.
- The handler must be able to adapt to diverse and unpredictable environments.
- A handler must have the motivation to learn and develop the skills required, and to learn from successes and failures.

K9 Selection

While not breed specific, the K9 should be of appropriate size, coat and demeanor to move unobtrusively through the health care facility. The selection is based on the dog's suitability and soundness for working in a hospital environment.

The dog shall be tested prior to training for temperament, including motivation, scent instinct, tenaciousness, reaction to sound, sureness of footing on various surfaces, comfort with variation in lighting. The dog shall be checked by a veterinarian prior to training through a physical exam, bloodwork, and urinalysis.

Training Guidelines

- The handler's development shall be conducted by a competent trainer utilizing the structured curriculum with specific training and learning objectives.
- Training shall include task-specific obedience to ensure the canine will operate effectively and safely in various environments.
- The canine shall be trained to perform a reliable and controlled search.
- The training of the canine shall include a final trained alert.
- Training shall include exposing the canine team to a variety of locations, situations and searches, and shall include IPAC's Routine Practices.
- Regular assessments will be conducted and may result in the canine and or handler being dismissed from the program.

Handlers' Academic Curriculum

Canine handler training combines practical skills and knowledge suitable for the task of interior search in an acute care facility. The following core subjects are covered in detail in the canine handler curriculum:

- Safety consideration of patients, staff and the K9 team.
- Daily Care and transportation of the canine.
- Emergency vet care.
- Air movement in a health care facility.
- The science of odour molecules.
- Odour discrimination.
- Use, storage, and accountability of scent kits.
- Search techniques; planning, execution and restrictions.
- Understanding of *Clostridium difficile*.
- Infection prevention and control.
- Routine practice.
- Recording the search, alerts, and incident reports.
- Recommendations by the certifying officials.

Team Certification

Certification by a competent authority is accepted proof of a team's ability to search for and locate *C.difficile* on surfaces. It is recommended that a team of certifying officials, consisting of a professional canine handler, certification expert or scenting judge, along with a senior infection prevention and control professional be recognized as the competent authority.

The nature of working scent work is such that a dog is inquisitive and is allowed the freedom to perform his task and still be under control of his handler. The certifying officials will use a series of tests which replicates the real world in which the team is expected to operate and will determine if the K9 team meets the performance objectives. The team's behaviour always while at the testing facility reflects their professionalism and will be taken into consideration.

The certifying official(s) shall not be routinely involved in the day to day training of the canine team being evaluated.

The assessments shall include:

- A documented series of successful odour recognition tests.
- A minimum of five area search assessments.
- Assessment of the canine's obedience.
- An assessment of the handler's knowledge of hospital culture and policies.
- Handler's knowledge of *Clostridium difficile* and its prevention and control.
- Veterinary clearance.

Failure:

A canine team that fails the certification process shall complete a corrective action plan before making another attempt to certify.

- Handler errors, when excessive may result in failure of the team.
- Entering a restricted area.
- Canine contact with a patient, visitor, or staff.
- Less than 90% on written tests.
- Out of control canine, or barking.

Odour Recognition Assessment

- Each odour discrimination assessment is the evaluation of the K9.
- The assessment shall test the dog's target odour discrimination using a combination of prepared hides; fresh C. diff positive stool, fresh C. diff negative stool and blank searches.
- The assessment will include distractions.
- The assessment shall be documented by the certifying official.
- The number and type of scent vessels and the number of runs shall be at the discretion of the certifying officials.
- Shall be double-blind. Scent shall be placed by a third-party scent steward who then exits the room.
- A missed hide or false positive alert may result in failure.

Area Search Assessment

- Area search assessment should take place in a controlled setting with equipment, lighting, sounds, surfaces and room size typical to a real-world search. A clinical unit shall be used searched prior to the assessment to ensure there is no C. diff scent already present.
- Scent shall be placed by a third-party scent steward at the discretion of the judge.
- Shall measure the team's ability to perform a clinical area search.
- Shall demonstrate the K9's ability to locate and alert to his target odour.
- Shall determine the handler's ability to accurately interpret the canine's changes in behaviour when an odour is detected and shall include a final alert response.
- Shall demonstrate the handler's control of the canine.
- A third party shall attempt to pet the K9.

Obedience Assessment

- This assessment shall measure the dog's response to the handler in situations other than while actively searching.
- The dog shall be required to walk at the owner's side for a distance of 100m, with multiple turns, walking around objects and people. The dog is not required to stay in the correct healing position but be controlled at all times.
- A loud noise will take place while the dog is walking at the owner's side. The dog should stay under control and show only minimal reaction.
- At the certifying official's direction, the handler will ask the dog to sit several times during this healing exercise.
- The dog will be taken onto an elevator and be comfortable as it moves from floor to floor. The dog shall not engage with people.
- The dog will be asked to sit and wait while the owner moves away from the dog and engages in a conversation with another person for 1 minute.
- The dog will be left in the secure environment provided by the handler (a crate, car etc.) for 30 minutes. It should not display excessive distress or barking.

Additional Assessments and Requirements

- Certification shall include a written test to determine the handler's general knowledge of Clostridium difficile, infection prevention and control, and IPAC's routine practice.
- The handler shall demonstrate compliance with a hospital's specific guidelines, procedures, and protocols.
- The certifying officials shall review the team's training and previous search and alert records.
- A clear bill of health from a veterinarian through physical exam, bloodwork, urinalysis and hip, elbow x-rays.

CLINICAL SEARCH PROTOCOL, HANDLER

The handler and K9 are equipped and prepared to perform their task. When reaching the clinical unit, the handler completes a walk-through without the dog to complete a risk assessment, to plan the search pattern, and prepare the unit staff for the K9's visit. The handler and dog's task are to find C.difficile on surfaces. When ready, the handler smoothly conducts and records the required surveillance data in the field notebook.

Equipment

- The dog must be clearly identified to onlookers as a medical search dog.
- The dog shall be on a cleanable leash no longer than 6 feet, and the leash shall not touch the floor. A water bowl shall be nearby and accessible.
- The handler's hands shall be free. Notebook, camera, stickers, gloves, treats, hides, and other required tools shall be stowed and shall not be carried by hand.
- The handler shall wear clean shoes dedicated to his work environment.
- The handler's lower arms shall be free of clothing.
- Swabs, saline, and C-diff growth medium may be carried by the ICP.
- It is not a requirement to carry a clean-up kit, but a system to clean and disinfect the dogs feet shall be accessible. Spare serviceable equipment shall be easily accessible.
- The dog must have a secure, healthy, safe space to be alone while not engaged in search duties.

Handler's Action on Alert

- After the alert and reward sequence the handler shall stop the search and the K9 shall be under control while the find is investigated and recorded.
- Mark the location of the find with the approved removable sticker.
- Take a photo to identify the general location, and record the photo file number in the field notebook.
- Have a hospital's representative protect the location.
- The K9 team's singular task is to locate C-diff on surfaces. The hospital's ICP and/or unit staff will decide the next actions.
- The handler shall continue the search in the clinical area.

MAINTENANCE TRAINING

Training conducted solely by the handler, to maintain the canine's proficiency is acceptable and is to be periodically supervised by a qualified training instructor. Maintenance training shall include the following:

- Regular training by the handler to maintain and enhance proficiency.
- Regular monthly training with the approved training instructor to maintain and enhance proficiency.
- Monthly review of the field notes by the training instructor to assess the ongoing training and protocols.

This training shall address and include:

- Correction of deficiencies or operational concerns.
- A variety of search locations, location sizes and environmental conditions.
- Varied duration of search times.
- Varied times of day/night.
- Positive and blank searches.
- A variety of distractions in the search area. (shoes, food, carts, people, sounds, bells, announcements, floor surfaces).
- A variety of target amounts, number of targets and a variety of methods of concealment.
- Searches using a variety of scent vessels and aids.
- Scents of varying hide ages.
- Varieties in age of scent from the time of scent preparation to search time/date.
- All training should be recorded in the field notebook.

ANNUAL PROFICIENCY ASSESSMENTS

- Yearly double-blind proficiency reassessment of the team's capabilities.
- At least 5 odour recognition searches should be conducted.
- At least 3 area searches should be conducted. Area searches should take place in a controlled setting with similar items, sounds, textures and room size to a real-world search. Ideally in a health care facility.
- Assessments should include negative, positive (when available) and blank searches.
- The hide steward should be a person new to the dog. After placement of the hides (if any) the steward should exit the location.
- After the search is done and the handler is confident, they have found all possible hides the steward should be brought in to confirm that all scents have been found and no false alerts were called.

- If the team has false positive alerts or has missed any finds, the team may be required to complete additional training and reassessment before continuing as a certified team in the field.
- All assessments should be recorded in the field notebook and be reviewed.

RECORD KEEPING AND DOCUMENT MANAGEMENT

The act of searching for C.difficile is an opportunity for IPAC to collect additional information which may be part of a larger effort to measure and analyze.

The handler has a duty to accurately record information, and to maintain detailed training, search and alert records. These notes should be clear and accurate using standard lab practices.

Documentation

- Training and proficiency assessment records may be combined or maintained separately.
- There must be a separate regulation notebook for each canine.
- The handler shall document all formal training, assessments, and certification.
- The handler's search and alert notes may be in an approved digital format. Alternatively the handler may use a lab notebook and shall be written in pen in an unalterable, permanently bound, regulation lab notebook, to lab standards, and kept for a minimum of one year.
- These notes may later be scanned electronically or rewritten in a report or other format for ease of use but must reference the field notes.

Health Care Searches Which are Part of an Audit or Study

- Time in and out of facility.
- Search times.
- Detailed notes on each alert.
- Location. and specific contaminant location.
- Dogs commitment / behaviour
- Photo identification number
- Protocols followed to identify and secure the contaminant location.
- Other information required by IPAC.
- The handler shall complete an incident report if the canine makes physical contact with a patient, visitor, or staff.

Each entry shall include, but are not limited to the following data:

- Date
- Names of ICP or the units delegated person.
- Location address
- Environmental conditions. (sounds, lighting, flooring, ventilation, heating etc.)
- Initial of everyone involved in the session at end of entry.

Entries taken during training and assessments.

- Training time rounded to 10-minute units. (Do not include travel or administration).
- Goal of session.
- A summary of the training methods.
- Scent used (bottle id, date).
- Scent vessel and scent aid used.
- Age of scent.
- Age of hide.
- Identification of who prepared and who hid the scent.
- Positive, negative, or blank search.
- Hide location, height, accessibility.
- Detailed search results.
- Commitment to search, difficulty, speed of response, pass/fail etc.
- Evaluation if goal was achieved.
- Next steps.
- Other information required by IPAC.

VETERINARY RECORDS

Veterinary records shall be maintained, be accessible and noted in the canine's field notebook.

Vaccinations required by provincial or local law shall be documented in the veterinary record of the canine. Yearly wellness checks by a veterinarian including a physical, blood and urinary analysis are required.

Glossary: Infection Prevention and Control (IPAC) Program Standard

Additional Precautions (AP): The precautions (i.e., Contact Precautions, Droplet Precautions, Airborne Precautions) that are necessary in addition to Routine Practices for certain pathogens or clinical presentations. These precautions are based on the method of transmission (e.g., contact, droplet, airborne).

Administrative Controls: Measures put in place to reduce the risk of infection to staff or to patients (e.g., infection prevention and control protocols and procedures, education, and training).

Airborne Precautions: Precautions that are used in addition to Routine Practices for patients known or suspected of having an illness transmitted by the airborne route (i.e., by small droplet nuclei that remain suspended in the air and may be inhaled by others).

Alcohol-based Hand Rub (ABHR): A liquid, gel, or foam formulation of alcohol (e.g. ethanol, isopropanol) which is used to reduce the number of microorganisms on hands in clinical situations when the hands are not visibly soiled.

Antibiotic-resistant Organism (ARO): A microorganism that has developed resistance to the action of several antimicrobial agents and that is of special clinical or epidemiological significance (e.g., ESBL, MRSA, VRE).

Area Search: A clinical unit, sometimes called an inpatient unit, which includes hallways, nursing stations, common washrooms, storage rooms, lounges, administration offices, and excludes patient rooms.

Champion: In infection prevention and control, opinion leaders modeling the right behaviour.

Certification in Reprocessing: Successful completion of a recognized certification course in reprocessing practices administered by an accredited body, such as the Canadian Standards Association (CSA).

Clostridium difficile (C. difficile): Clostridium difficile causes antibiotic-associated colitis or pseudomembranous colitis and is the most important cause of health care-associated infectious diarrhea. C. difficile produces hardy spores that are resistant to destruction by many chemicals used for cleaning and disinfection. Spores are shed in faeces, live in the environment for a long time, and may be transferred via the hands of health care workers.

Contact Precautions: Precautions that are used in addition to Routine Practices for patients known or suspected of having an infection that can be transmitted by direct or indirect contact.

Contractor: An individual or employer hired under contract to provide materials or services to another individual or employer. For the purposes of this document, contractors are included as Staff.

Culture of IPAC Safety: The shared commitment and demonstrated values, attitudes and actions of a health care organization's leaders and staff that support the belief that the work environment is to be safe from infection acquisition and transmission.

Denominator: In epidemiology, the population at risk.

Droplet Precautions: Precautions that are used in addition to Routine Practices for patients known or suspected of having an infection that can be transmitted by large infectious droplets.

Emergency Response Plan (ERP): A coordinated approach to the preparation for disasters and emergencies.

Engineering Controls: Mechanical measures that are put in place to reduce the risk of infection to staff or patients (e.g., heating, ventilation and air conditioning systems, room design, placement of hand washing sinks).

Fit test: A qualitative or quantitative method to evaluate the fit of a specific make, model, and size of an N95 respirator on an individual. Fit testing is to be done periodically, at least every two years and whenever there is a change in respirator face piece or the user's physical condition which could affect the respirator fit.

Goals: Desired endpoints in organizational development. Goals can be long-term, intermediate, or short-term.

Hand Care Program: A key component of hand hygiene that includes hand care assessment, health care worker education, provision of hand moisturizing products and provision of ABHR that contains an emollient.

Hand Hygiene: A general term referring to any action of hand cleaning. Hand hygiene relates to the removal of visible soil and removal or killing of transient microorganisms from the hands. Hand hygiene may be accomplished using an alcohol-based hand rub or soap and running water.

Hand Washing: The physical removal of microorganisms from the hands using soap (plain or antimicrobial) and running water.

Health Care-associated Infection (HAI): An infection associated with the delivery of health care that was not present prior to receiving health care.

Health Care Facility: A set of physical infrastructure elements supporting the delivery of health-related services (i.e., “the building”). A health care facility does not include a patient’s home.

Health Care Organization: Any facility, corporation, agency, association, consortium, or company where health care is provided. This includes organizations where emergency care is provided, hospitals, complex continuing care, rehabilitation hospitals, long-term care homes, mental health facilities, outpatient clinics, community health centres and clinics, physician offices, dental offices, independent health facilities, out-of-hospital premises, offices of other health professionals, public health clinics and home health care.

Health Care Worker (HCW): An individual who works in a health care organization and has direct contact with patients, including but not limited to a nurse, physician, dentist, nurse practitioner, paramedic and sometimes emergency first responder, allied health professional, unregulated health care worker, clinical instructor and student, housekeeping staff and volunteers. Volunteers are individuals who work without pay and are part of an organization’s program delivery team. Health care workers have varying degrees of responsibility related to the work they do, depending on their level of education and their specific job/responsibilities.

Home Care: The delivery of a wide range of health care and support services to clients/patients for health restoration, health promotion, health maintenance, respite, palliation and for prevention/delay in admission to long-term residential care. Home care is delivered where clients/patients reside (e.g., homes, retirement homes, group homes and hospices).

Infection Prevention and Control (IPAC): The discipline concerned with preventing health care-associated infection.

Infection Prevention and Control (IPAC) Canada: A professional organization of persons engaged in IPAC activities in health care settings. IPAC Canada members include infection prevention and control professionals from several related specialties including nursing, epidemiology, medicine, laboratory technology and public health, as well as industry. The IPAC Canada website is located at: ipac-canada.org.

Internal Audit: An audit carried out by individuals who work in the health care organization.

IPAC Audit: A comprehensive and objective evaluation of the design and effectiveness of a health care organization’s IPAC program against an approved standard.

IPAC Program: A unit in the health care organization that specializes in infection prevention and control and which is administered by a team of individuals with IPAC training and expertise.

IPAC Standard: An overarching requirement of an attribute of the IPAC program.

Leadership: The state or position of being a leader of a group of people or an organization, or the ability to do this.

Manager: A person who has accountability and responsibility for administering and/or supervising the operational affairs of a health care organization and/or who has authority over staff.

Measurable Objectives: Specific, measurable steps that can be taken to meet a goal.

Methicillin-resistant Staphylococcus aureus (MRSA): A strain of Staphylococcus aureus that is resistant to beta-lactam antibiotics, such as cloxacillin and cephalosporins.

N95 Respirator: A personal protective device that is worn on the face and covers the nose and mouth to reduce the wearer's risk of inhaling airborne particles. A NIOSH-certified N95 respirator filters particles one micron in size, has 95% filter efficiency and provides a tight facial seal with less than 10% leak.

Numerator: Each event that occurs among a population at risk (the denominator) for the event under surveillance.

Occupational Health Services (OHS): Preventive and therapeutic services provided in the workplace by trained occupational health professionals, e.g., nurses, hygienists, physicians.

Outbreak Management Team (OMT): A multidisciplinary committee that has the authority to implement changes in practice or take other actions that are required to control an outbreak.

Outcome Surveillance: Surveillance used to measure outcomes that can be attributed to care in a health care organization (e.g., health care-associated infections). An example of outcome surveillance related to the IPAC program is surveillance of infection rates.

Patient: To this document, the term "patient" includes clients, patients, residents, and others receiving health care.

Performance Indicator: A quantifiable measurement that reflects the critical success factors of a health care organization. Performance indicators are related to IPAC program goals or objectives and provide a means for tracking performance against that goal or objective, to guide action toward improvement and enhancement.

Personal Protective Equipment (PPE): Clothing or equipment worn for protection against hazards.

Policy: The documented principles by which a health care organization is guided in its management of affairs.

Process Surveillance: Surveillance used to assess or measure processes (things done to or for a client/patient/resident during their encounter with the health care system). An example of process surveillance related to the IPAC program is the assessment of compliance with procedures and/or standards of practice, e.g., by conducting planned audits.

Rationale: When applied to an IPAC standard, the scientific analysis, evidence, best practice, or guidance to support or validate the standard.

Risk: IPAC-related threats or negative outcomes that can be expected to occur if an operation or practice does not meet the standard (i.e., is not performed or is performed incorrectly).

Scope: For this document, the breadth of the IPAC program, encompassing the extent of the area, subject matter, target audience and/or stakeholders.

Staff: Anyone conducting paid activities in a health care organization, including but not limited to, health care workers and contract workers. See also, Health Care Workers.

Supervisor: Anyone who directs the work of another employee.

Surge Capacity: Sufficient capacity or appropriate resources for day-to-day operation and an ability to redirect resources in a time of need.

S.W.O.T Analysis: A structured planning method used to evaluate the strengths, weaknesses, opportunities, and threats involved in a project or program.

Syndromic Surveillance: The detection of signs and symptoms of infectious diseases that are discernible before confirmed laboratory diagnoses are made.

Vancomycin-resistant Enterococci (VRE): Strains of *Enterococcus faecium* or *Enterococcus faecalis* that are resistant to vancomycin and/or contain the resistance genes *vanA* or *vanB*.

Visitor: Any person in the health care organization who is not under the direct control of the employer.

Work-life: The practice of providing initiatives designed to create a more flexible, supportive work environment, enabling staff to focus on work tasks while at work.

GLOSSARY, K₉ TERMS

Absolute Threshold

Operational usage: The minimum intensity of a stimulus that is detected by a dog. In the case of odour it is the minimum concentration of vapor. This threshold varies from dog to dog and is affected by climate and the internal and external environment.

Scientific usage: AT is determined by a statistical average based on the point where a specific compound can be detected 50% of the time.

Note: This definition acknowledges that large and small amounts of the same compound do not necessarily smell the same to the dog. The “absolute” may not be as relevant as it was formerly because of recent developments in learning.

Accidental reinforcement / Cueing

Scientific usage: Reinforcement delivered independently of any response on the part of the subject. Despite the lack of a ‘true’ cause-and-effect relationship between the individual’s responses and the received reinforcements, adventitious reinforcement can have a powerful effect on behavior.

Active avoidance

Scientific usage: A non-reflexive response made to avoid an aversive event. Active avoidance is usually contrasted with passive avoidance where the animal learns that it must refrain from making a response.

Activity Drive

Operational usage: The propensity to be active.

Adaptation

Scientific usage: In evolution a change in behavior or in form over time that helps the animal to survive. The ability to learn to exhibit certain behaviors in certain contexts is likely an adaptation. For example, baying of hounds is likely an adaptation to the types of behaviors or jobs for which they were developed. A thick undercoat and heavily plumed tail are likely adaptations for a cold environment in Nordic breeds, e.g., Malamute.

Adolescent dog

Scientific usage: A dog that has not yet reached social maturity.

Adult dog

Scientific usage: A dog for whom physical growth is complete, and who has reached social maturity.

Aged trail

A trail that has been present for some period.

Aggression

Scientific usage: Description of an act that is an outcome of an agonistic interaction. It can

be appropriate or inappropriate, and involve a threat, challenge, or contest. Note: The word “aggressive” is often used as a descriptive term for intense, enthusiastic, or forceful behavior of any kind, and these dogs may not be truly aggressive or possess aggression.

Air Scent Dog

Operational usage: A dog using air scenting techniques to detect a trained odor.

Air Scent Drive

Operational usage: The propensity to locate targets by using windborne odors.

Air Scenting

Operational usage: A technique used by a dog to locate a target odor. The dog searches for target odor on wind / air currents and attempts to identify / work on a scent cone to the source.

Alert

A characteristic change in ongoing behavior in response to a trained odor, as interpreted by the handler. The components of the alert may include: COB, interest, and final response or indication. Alert has been used / defined by various agencies as a range of responses from a change of behavior to a final response.

Anthropocentrism

Assuming that the animal see things from a human viewpoint. Attributing human values, emotions, and thought processes to an animal.

Approach-approach conflict

Scientific usage: A conflict resulting from having the choice of two equally desirable but mutually incompatible, unobtainable goals or stimuli. The conflict is generally resolved when one gets behaviorally or physically closer to one of the two goals or stimuli since desirability increases with closeness. This type of conflict is easily solved by approaching one of the sources of reinforcement, or by having one of the sources of reinforcement approach the individual making the decision.

Approach-avoidance conflict

Scientific usage: A conflict resulting from being both drawn and repelled by the same stimulus. With distance the stimulus appears more desirable,

Backward Chaining

Scientific definition: Process in which an animal learns to emit a series of responses. A chain is trained backwards, beginning with the last behavior, then the second to last behavior, et cetera.

Baseline (or base rate)

Scientific usage: The normal frequency of occurrence of any response per unit of time for that individual or group of individuals.

The purpose of all training is to either increase or decrease the frequency of a behavior from its baseline level. Baseline usually refers to the frequency of a behavior before training starts. For example, all dogs will sit at some individual rate (a baseline). Once trained, a dog that sits on target odor is increasing the frequency of the behavior above baseline. If the frequency reliably increases or decreases from the baseline, then training was effective.

Behavioral Chain

A series of independent behaviors that are linked together. Detection dog example for chaining: A dog is taught a sit command. The dog is now introduced to a box with a target odor inside and staring is elicited in anticipation of a reward. Once the behavior of staring into the box is learned, the sit behavior is added, chaining the stare and the sit.

Boldness

Scientific usage: A characteristic of a dog that is resilient in novel or stressful situations, exhibits minimal fear, and recovers quickly.

Casting

1. A description of the dog's movement as the dog searches for and/or follows the concentration of target odor.
2. A directional command to the dog.

Certification

A process that attests to the successful completion of an examination of relevant skills for the canine team.

Certifying Officials / Assessors

Suitably authorized individuals trained to administer and assess an examination of relevant skills for canine team.

Chaining

The process of linking behaviors together to form a chain. In most cases, each component of the chain is individually learned, and the "chaining" consists of linking them together, usually starting with the final behavior and then adding the next-to-final behavior and so on. This is often called backward chaining or linking in reverse order.

Chain-of-behaviors

Two or more behaviors that occur in a fixed order. The termination of the first behavior is the signal to start the second behavior.

Change of behavior

Operational usage: A characteristic that occurs when the dog detects a trained odor. This differs from other olfactory interest that otherwise are exhibited by the dog in response to the daily environment. The pattern of behavior may be unique to each dog.

Character / Personality Traits / Dimensions

Scientific usage: Behavioral qualities that are relatively constant and reliable, and frame or affect the dog's response in all contexts. The best scientific evidence for these patterns is for what has been called shyness / nervousness and boldness in dogs.

Classical Conditioning

Scientific usage: Classical or Pavlovian conditioning is a form of learning by making associations. In the true sense it involves a neutral stimulus, an unconscious response, and a conditioned response that links the first two. Classical conditioning is a simple form of behavior modification where a neutral stimulus elicits the behavior for which there was formerly no association. Once established, classical conditioning leads to anticipation.

Coercion Training

Scientific usage: Coercion deals with compliance induced by physical or mental pleasure.

Cognition

Scientific usage: The mental process by which an animal solves problems.

Concentration

Operational usage: The dog's focus on the area of search (further specification will be discipline specific).

Conditioned Aversive Stimulus

Scientific usage: A stimulus that is initially neutral but has acquired aversive properties by virtue of being paired with aversive events. As a result of classical conditioning, an event that is initially neutral will acquire aversive properties because it is paired with other aversive events. This is exactly like the bridge, but it happens with aversive events. Ex. A "leave it" command is associated with a physical/verbal correction.

Conditioned Fear

Scientific usage: Fear in response to a previously neutral stimulus caused by aversive conditioning and/or event.

Condition Reinforcer

A stimulus that becomes a reinforcer because it is paired with another reinforcer, usually a primary reinforcer. If conditioned reinforcers are not maintained by periodically pairing them with primary reinforcers, they will lose their reinforcing value.

Example: A previously neutral clicker comes to have reinforcing properties because of its pairing with the delivery of food.

Deployment

Operational usage: After initial assessment of the search environment, the handler conducts an efficient, effective, and thorough search.

Deployment Log

A record of the use of a trained dog.

Discriminative Stimulus

Scientific usage: A stimulus that signals when a particular response produces specific consequences. For example, sitting in the presence of an odour leads to a reward. The odour in this case is the discriminative stimulus.

Drive

Operational usage: Drive is the propensity of a dog to exhibit a pattern of behaviors when faced with stimuli. Drives are triggered by these stimuli and expressed in a typical and predictable way that is associated with the stimulus. Drives can be enhanced or diminished through experience (e.g., training, environment, et cetera), but they cannot be created or eliminated.

Environmental Training/Testing:

Operational usage: Instruction and evaluation procedures used to teach a dog to work, and determine whether a dog can work, in a variety of operational environments with increasing biological and physical complexity, which may distract or inhibit the dog from work. The training and testing, respectively, are designed to teach the dog to work, and assure that the dog can work, in a variety of operational environments, some of which may be extreme.

Experimental bias

Scientific usage: Anyone testing any idea has a strong expectation about the outcome, and an interest in not being mistaken. This is the experimental bias. The only way to control for this is by ensuring the person making the measurements does not know what treatment each subject received until the experiment is completed.

Consequences (Reinforcement / Punishment)

The timing involved in delivering consequences for a response directly following the response in time. This reduces the likelihood of inadvertently reinforcing/punishing some other behavior. Research has repeatedly shown that consequences have their greatest effect on behavior they most closely follow. This is especially true for consequences in the context of dog training procedures.

Imprinting

A phenomenon by which an animal during a formative stage of life forms a lasting attachment to, and preference for, some object or activity through exposure to the same independent of consequences. Often used by trainers to describe initial target odor discrimination training however, this is not the scientific definition of imprinting. This operational definition describes a form of early associational training.

Independent / independence

Scientific usage: Statistical studies assume a property called independence - a situation

where the data collected are not related to each other because they come from a random sample from the population examined; independence is often assumed but seldom tested. Good statistical testing tests for independence when its presence is unclear.

Indication

Operational usage: The dog's response to the odor in the way it has been trained, independently and without distraction.

Instinct

Operational usage: The innate tendency to react in specific ways in specific circumstances. Behaviors that are not taught and are stereotypical in action and similar in all members of a species. Instinctual behaviors are provoked by relatively simple stimuli.

Interest

Operational usage: Any reaction to an odor which may include:

1. A noticeable, readable, physical change in behavior in a detector dog during the search when the dog reacts to (i.e., is interested in) an odor.
2. Pattern of behavior following the dog's initial reaction to a trained odor when the dog displays enthusiasm and desire to remain and trace the trained odor to its source.

Inter-observer reliability

Scientific usage: The extent to which different observers obtain the same results when measuring the same behavior; this is often also called repeatability; this can be a function of the humans, but it is more a function of the scoring system.

Maintenance Training

Operational usage: Continuing training conducted beyond the initial training of a discipline, designed to maintain a level of proficiency by ensuring the team's capability to perform desired tasks.

Miss

Certification/Training use: When the dog fails to alert in the known presence of the target odor; a situation in which the dog fails to exhibit the trained behaviors in the presence of the target odor on which he or she was trained. Also referred to as a "false negative" or "non-alert".

Non-productive response

Operational usage: A change of behavior followed by a positive indication which cannot be confirmed by the handler. This may be the result of residual odor that the dog can detect but which cannot be confirmed by technology or direct observation. A non-productive response may also be an error – a false positive - but these outcomes cannot be distinguished in an operational environment. In a certification procedure you will know whether you have a false positive. You cannot know whether you have a false positive in most operational situations.

Reliability

Operational use: Low probability of alerting to anything other than a target odor and a high probability of alerting to a target odor.

Scientific usage: The extent to which a measurement is repeatable and consistent and free from random errors; all measurements have random components because of imperfections in the measurement process, and the fact that when we measure something we usually change it a bit. Reliability is determined by precision, sensitivity, resolution, and consistency. It is the extent to which similar results are obtained when measuring the same behavior on different occasions.

Scent cone

Scientific usage: The path of dispersion that the odor follows in the given wind or air currents, and in each thermal environment.

Scent discrimination

Operational usage: A dog's olfactory ability to distinguish between various odors.

Scent picture

Operational usage: The combination of odors that is present when a detector dog responds to a trained odor.

Search Intent

Operation usage: The interest, attitude, and enthusiasm the dog shows while searching.

Sensitivity

Scientific usage: A measure of how much small changes in the true value lead to changes in the measured value; this term is commonly used in diagnostic tests.

Specificity

Scientific usage: The extent to which the measure describes what it is intended to describe and nothing else; this term is commonly used in diagnostic tests....specific tests detect ONLY that disease, not all diseases that cause a similar reaction; the ideal diagnostic test has both high specificity and sensitivity.

Statistical significance

Scientific usage: The level of statistical significance is the probability of obtaining the observed result.

Systematic Search Pattern

Operational usage: A method which employs a specific search sequence to increase accuracy and minimize omissions, while maximizing coverage. Such patterns usually have set start and stop points.

Target odour

Operational usage: Odours which detector dogs are trained to detect.

Unconfirmed Alert

Operational usage: An alert for which the presence of a trained odor cannot be confirmed. This may be the result of residual or lingering odor that the dog can detect but which has not been confirmed by technology or direct observation.