

Canine Decontamination

Guidelines for Emergency, Gross,
and Technical Decontamination of the
Urban Search & Rescue Canine



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Why Decontaminate?

- 5 Canines are exposed to multiple hazards during search
- 5 The toxicity to canines ranges from the very mild (dirt, mud) to life-threatening (chemical, biological, radiological)
- 5 They may also transmit hazardous materials back to others

Definitions

5 Gross Decontamination

- ☐ Emergency
- ☐ Non-Emergency

5 Technical Decontamination

- ☐ Emergency/Medical
- ☐ Non-Emergency/Medical

Gross Decontamination

5 **Emergency** = immediate reduction of contaminant for life-threatening conditions

- Goal: save lives

5 **Non-Emergency** = bulk removal of non-life threatening contaminant

- Goal: quick wash



Technical Decontamination

- 5 **Emergency/Medical** = HazMat or WMD

situation, complete decon is part of life-saving medical treatment

- Goal: save lives

- 5 **Non-Emergency/Medical** =

complete removal of non-life threatening contaminant to avoid future complications

- Goal: thorough decontamination



Treatment Before Decon?

5 Need, ability depend on several factors

- Medical status (life-threatening?)
- Medical personnel presence in hot/warm zone
- On site medical supplies
- Safety of personnel



Canine Factors

- ▶ Routes of Exposure
- ▶ Ambulation, Ground Proximity
- ▶ Sensitivity
- ▶ Toxic Agents of Concern
- ▶ Anatomy, Metabolism
- ▶ Physical Signs, Symptoms
- ▶ Familiarization and Training

K9 Routes of Exposure

- Ocular
- Inhalation
- Ingestion
- Dermal
- Injection



Ocular Route of Exposure

- **K9 more susceptible due to**
 - 👁 Lack of eye protection
 - 👁 Sniffing may aerosolize particulates
 - 👁 Settling dust closer to the ground
 - 👁 Eye protection may interfere with mobility in tight spaces



Inhalation Route of Exposure

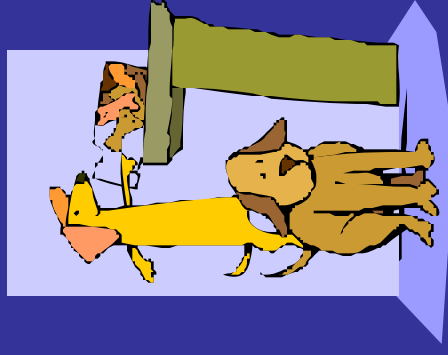
- **K9 more susceptible due to**
 - 🐕 Increased use of respiratory tract
 - 🐕 Sniff near ground where contaminants tend to concentrate
 - 🐕 Increased surface area
 - more absorption area



Advantages:
Traps contaminants, inflammatory mediators
and lung defense mechanism advantages

Ingestion Route of Exposure

- **K9 more susceptible due to**
 - 🐾 Adventurous taste-testers of unidentified substances
 - 🐾 Hunger or thirst during long search may tempt even the best trained
 - 🐾 Licking nose, mouth, and to clean self
 - 🐾 Licking paws heavily exposed to environment



Dermal Route of Exposure

- K9 more susceptible due to
 - 🐕 No PPE
 - 🐕 Fur attracts and traps contaminants
 - 🐕 Fur may decrease detection of a wound
 - 🐕 Less-furred areas have increased exposure (inner ear, axillae, abdomen, flank, scrotum)

Advantage: fur traps contaminant and keeps it from skin absorption (makes decon harder)

Injection Route of Exposure

- **K9 more susceptible due to**
 - 🐕 High risk wounding of unprotected paws
 - 🐕 Fur may hide a wound where absorption can occur
 - 🐕 Nature of urban search is rubble - sharp objects, hazards increase risk of wounding



K9 Ambulation, Ground Proximity

Working close to the ground:

- 🐕 Hazardous materials concentrate on ground, low surfaces
- 🐕 Chemical agents often dispersed as gases/aerosols heavier than air
- 🐕 Eyes, nose, mouth, paws subjected to constant exposure

K9 Toxin Sensitivity

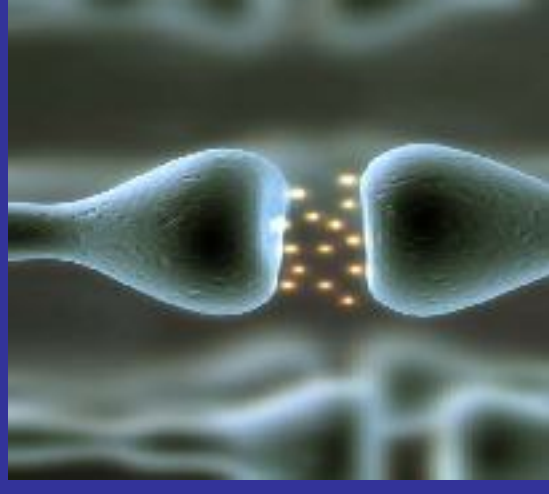
Compared to Humans

➤ Chemical Agents

➤ Biological Agents

➤ Radiological Agents

Chemical Agent Sensitivity



5 Nerve Agents

☠ Tabun (GA)

- $\frac{1}{4}$ as sensitive to inhalation form
- $\frac{1}{2}$ as sensitive to dermal form

☠ Sarin (GB)

- $\frac{1}{4}$ as sensitive to inhalation form
- 2 times as sensitive to dermal form

☠ Venom X (VX)

- ~ same sensitivity as humans to both forms

Chemical Agent Sensitivity

5 Blister Agents

☠ Mustard (HD)

- $\frac{2}{3}$ as sensitive to inhalation form
- $\frac{1}{4}$ as sensitive to dermal form

5 Blood Agents

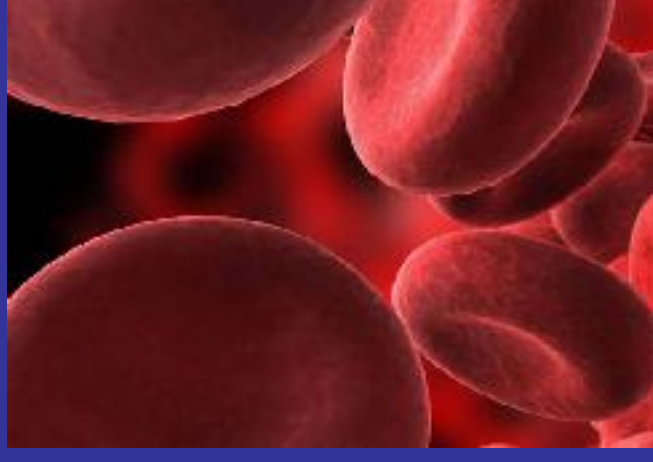
☠ Hydrogen Cyanide (AC)

- 4 times as sensitive to inhalation form
- ~ same sensitivity to dermal form

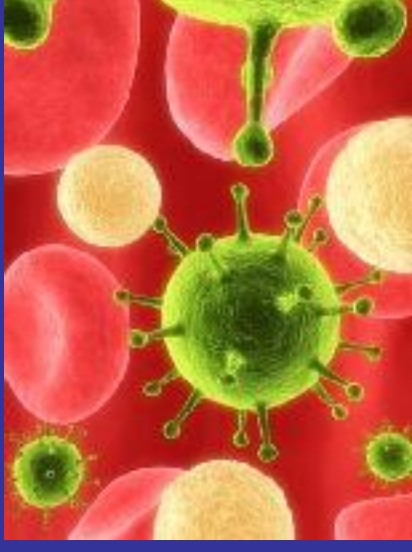
5 Riot Control Agents

☠ CN, CS, OC

- Quite insensitive to these



Biological Agent Sensitivity



- ◆ **Bacteria**
 - ◆ Anthrax - 500-1000 times more resistant
 - ◆ Typhoid - naturally resistant
 - ◆ Brucellosis - susceptible, zoonotic
 - ◆ Plague - intermediate host for flea transmission
 - ◆ Tularemia - susceptible but less sensitive

Biological Agent Sensitivity



🌀 Rickettsia

🌀 Q Fever – susceptible
but less sensitive

🌀 Virus

- 🌀 Venezuelan Equine Encephalitis -
susceptible but less sensitive
- 🌀 Smallpox - canines naturally resistant

Biological Agent Sensitivity

☠ **Toxins** – canine susceptible but less sensitive

☠ Botulinum

☠ Ricin

☠ Staphylococcal

Enterotoxin B



Ricinus communis







Castor Beans

Radiological Agent Sensitivity



 Radiological materials
emit ionizing radiation -
enough energy to alter cells

 Forms of radiation

-  **Alpha particles** - dangerous if ingested
-  **Beta particles** - dangerous if ingested
-  **Gamma** - significant penetration
-  **Neutron** - cell damage on contact

Radiological Agent Sensitivity



-  Canines appear to be ~ 25% - 50% **more sensitive** than humans to the acute effects of the same radiation exposure
-  Due to lack of PPE, **decontamination** is an important aspect of treating exposure

Toxicological Agents of Concern



- 5 Some commonly encountered toxins in an urban search and rescue environment
- 5 Decontamination important for health of canine and all with whom they contact

Toxic Agents of Concern

Hydrocarbons

-  Gas, oil, trans fluid, toner, inks, adhesives
-  Ingestion/inhalation most harmful

Polychlorinated Biphenyls (PCBs)

-  Coolant, turbines, air conditioners, TVs
-  Dermal/oral exposure → organ failure/cancer

Hazardous Metals

-  Chromium, cobalt, lead, mercury, nickel, zinc
-  Inhalation concern; wet coat, do not brush

Toxic Agents of Concern



Asbestos

- Fireproofing, insulation, bind in pipes/cement
- Inhalation concern; wet coat, do not brush



Soaps and Detergents

- Industrial disaster, fire suppression foam
- Cationics toxic: corrosive, pain, paralysis



Acids and Alkalis

- Battery fluid, oven/pipe/toilet/drain cleaners
- Corrosive, burns on contact or if inhaled

Toxic Agents of Concern



Ethylene Glycol

- ☠ Antifreeze, deicer, solvents, brake fluid, inks
- ☠ Sweet taste; 'animal safe' has bad taste
- ☠ Mainly ingested → renal failure, neuro signs
- ☠ Decon feet (licking), black light may show up



Propylene Glycol

- ☠ Drugs, ink, antifreeze, deicer, resin, lubes
- ☠ Rapid absorption if ingested
- ☠ 1/3 toxicity of EG: organ damage, sz, coma



Toxic Agents of Concern



Phenol

- ☠ Resins, detergents, dyes, antiseptics
- ☠ Caustic, absorption → seizure, coma, death
- ☠ Ingestion highly toxic



Alcohols

- ☠ Solvents, intermediary chemicals
- ☠ Problems if absorbed in large quantities

Documented Toxin Levels

New York Police Department working canines deployed to the World Trade Center, Sept 11-19,

2001 Fox PR, JAVMA Vol 233, July 2008

Prolonged exposure compared to brief exposure

🐕 Mean blood [lead] significantly higher

🐕 Mean serum [iron] not significantly different



Documented Toxin Levels

New York Police Department working canines deployed to the World Trade Center, Sept 11-19, 2001 Fox PR, JAVMA Vol

233, July 2008

Environmental toxins detected in serum of dogs in both prolonged and brief exposure groups

- Quinoline
 - 3-methyl quinoline
 - Isoquinoline
 - Diphenylamine
 - Surfynol
 - 2-(1-phenylethyl) phenol
- } carcinogenic, mutagenic



K9 Anatomy, Behavior, and Metabolism

Aspects of the canine make this species both more susceptible to harm as well as more resistant to the dangers they may face during search

K9 Anatomical Considerations

EYES



- Similar to human anatomy
- Disadvantages
 - 👁 No eye protective equipment worn
 - 👁 Close to ground where contaminants concentrate
 - 👁 Sniffing can aerosolize dust near eyes

K9 Anatomical Considerations



EARS

- Middle & internal similar to human, canal differs
- **Advantages**
 - ⌘ Floppy cartilages some protection to canal
 - ⌘ Canal 90° turn, adds protection to ear drum
- **Disadvantages**
 - ⌘ No ear protective equipment worn
 - ⌘ Upright cartilage open to exposure

K9 Anatomical Considerations



NOSE

- Different to humans in length, sensitivity, intricacy inside
- **Advantages**
 - ∞ Length, intricacy traps particles
- **Disadvantages**
 - ∞ No nose protective equipment worn
 - ∞ High risk for inhalation exposure
 - ∞ Mucosal surface sensitive absorptive area

K9 Anatomical Considerations

TONGUE

- Similar (but larger) to humans; other purposes (pant, scent)
- **Disadvantages** - behavioral
 - ↳ Potential damage if licks something harmful
 - ↳ Open mouth during scenting/panting allows increased exposure to particle contaminate
 - ↳ Lick contaminated nose, mouth, body, paws



K9 Anatomical Considerations



SKIN

- Different blood supply than human
- Advantages
 - 🐕 Many areas protected by thick fur
- Disadvantages
 - 🐕 No protective suit worn
 - 🐕 Vulnerable spots: inner ear, nose, axilla, abdomen, inner flank, scrotum, paw pads
 - 🐕 Does not blister; wounding hidden by fur

K9 Anatomical Considerations



FUR

- Different distribution and thickness than humans
- **Advantages**
 - 🐕 Traps particles, protecting skin
- **Disadvantages**
 - 🐕 More difficult to decontaminate
 - 🐕 Skin wounds more difficult to detect

K9 Anatomical Considerations

TAIL

- Unique and expressive body part
- Advantages
 - 🐕 Behavioral monitor for humans
- 🎵 Just a note
 - 🐕 Don't forget the tail in decontamination
 - 🐕 Hard to get to the underside and perineal area if it is tucked in tight



K9 Anatomical Considerations

AMBULATION, PAW PADS, HEIGHT

- Unique aspect compared to humans

➤ Advantages

- 🐾 Thick, tough pads protect

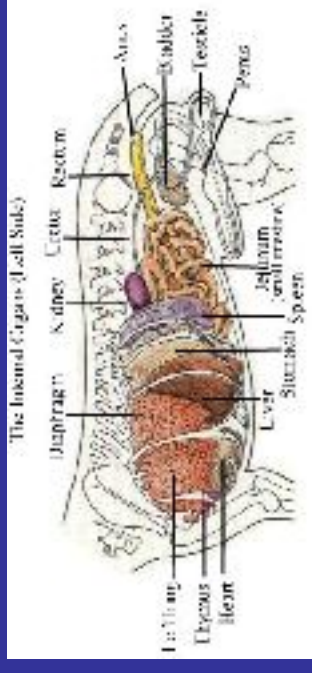
➤ Disadvantages

- 🐾 Pads - hairless, sweat glands, will absorb nerve agents
- 🐾 Deep crevasses hard to decontaminate
- 🐾 Ambulation, low to ground ↑'s exposure



K9 Metabolic Considerations

- **Rate that organs handle contaminants**
 - Absorption via skin, respiratory tract, digestive tract into circulatory system
 - Filtering and altering through liver, spleen, kidneys
- **Sensitivity and metabolism depend on many factors**
 - Health status, body condition, age, dose of toxin, decontamination and treatment



K9 Exposure Signs and Symptoms

➤ Many signs of toxin exposure
are common in canine and
human

➤ Other signs are more difficult to
recognize or confirm

Recognized K9 Exposure Signs

- 🐕 **Respiratory** - cough, choke, gasp for air
- 🐕 **Mucous Membranes** - red eyes and gums
- 🐕 **Ocular** - tearing, pinpoint/dilated pupils
- 🐕 **GI Signs** - salivation, nausea, vomiting, diarrhea, abdominal cramping
- 🐕 **Mentation** - malaise, fatigue, disorientation
- 🐕 **Neurological** - twitching, seizure, paralysis

Hard to Recognize Signs in K9



- 🐕 **Headache**
- 🐕 **Tightness in chest**
- 🐕 **Sweating** - axillae, inner flank, paw pads
- 🐕 **Skin rash** - in places hidden by fur until advanced; may detect sensitivity by touch
- 🐕 **Blisters** - due to different blood supply, skin forms burn-like wounds instead

K9 Familiarization and Training

- ▶ Familiarization for both handler and canine will decrease stress, speed the process, and limit errors
- ▶ Drills allow for decontamination stations to be set up and for canines to be run through them

Preventative Measures

Preventative measures are worth far
more than can be calmly expressed

DO THEM...

PLEASE !

Prevention – Skin, Fur, Pads

Minimizing dermal contamination and absorption

- 🐾 Bathing, rinsing, wiping coat decreases particle load
(baby wipes; inner ear, face, under tail)
- 🐾 **Booties** when not needed for traction
(familiarize at training, not on site)
- 🐾 **Frequent body checks** for cuts, abrasions; treat/protect early



Prevention – Eyes

Minimizing ocular contamination and absorption

- Regular flushing of the eyes with 0.9% saline or purified water (keep applicator tip clean, do not touch to eye)
- Goggles when not needed for search if in dusty environment (familiarize at training, not on site)



Prevention – Nose and Mouth

Minimizing facial contamination and oral absorption

- ∞ Routinely wiping around nose and mouth
(baby wipes work well if available)
- ∞ Canines often use tongue to wipe these areas and toxin ingestion a real concern





Prevention: Hydration



Maintaining adequate hydration

- Maintains health, decreases medical issues - important in cold and warm weather
- Decreases temptation to drink from a standing pool of liquid - **potential disaster!**
- Encourage drinking bottled water - frequent small amounts, place low so won't aspirate
- Flavoring, hydration powders - encourages drinking, does not significantly alter electrolytes

Hydration Guidelines

- **Maintenance fluids** are ~2-4 mg/kg/hr, (about 3 liters a day for an 80-90 pound dog)
- **Additional needs** are based on the humidity, temperature, workload, and time worked (intake may ↑ 1.25, 1.5, even 2X maintenance)
- **Periodic evaluation** of hydration status is important (mucous membranes, capillary refill, skin tenting, dark/concentrated/infrequent urine)



Prevention – Work Rest Cycles

Adequate Work-Rest Cycles

- 🐕 Important aspect for canine health
- 🐕 Minimizes fatigue and medical issues
- 🐕 Maximizes search efficiency and safety

🐕 FEMA search canine guidelines

- 🐕 Shift length of 12 hours
- 🐕 For every 20-45 minutes of work, rest for equal time period



Documentation of Acute Injuries Reason for Preventative Measures

New York Police Department working canines
deployed to the World Trade Center, Sept 11-19,

2001 Fox PR, JAVMA Vol 233, July 2008

- 🐕 Fatigue 62.9%
- 🐕 Conjunctival irritation 62.9%
- 🐕 Respiratory problems 16%
- 🐕 Dehydration 13%
- 🐕 Cuts and abrasions 12%



Decontamination

Principles, Procedures, Goals

- ▶ Basic Decontamination Information
- ▶ Human Safety in Decon Line
- ▶ Going Through the Line
- ▶ Decontamination Corridor
- ▶ HazMat Concerns: Chemical, Biological, Radiological
- ▶ Petroleum-Based Contaminants

K9 Decon Basics

Canine Decontamination

General Principles for the
Removal of Contaminants

K9 Decontamination Basics

Consult references if possible



Books

- Material Safety Data Sheet (**MSDS**)
- Emergency Response Guidebook (**ERG**)
- Small Animal Toxicology & Poisonings by **Gfeller, Messonnier**



Telephone

- Animal Poison Control Center (APCC) 888-426-4435, \$60
- National APCC @ University of Ill 800-548-2423, \$30
- ChemTrec 800-424-9300
- National Response Center 800-424-8802



Internet

- CDC and ATSDIR @ www.bt.cdc.gov
- CBRNE @ www.bigmedicine.ca/toolsGregoryBanner.htm

K9 Decontamination Basics



➤ Powders

- Initially wipe off with moist towelette
- **Avoid brushing** - aerosolizes contaminant, increasing inhalation exposure

➤ Thick Caked-On Substance

- Break down - mechanics' soap, mineral oil for petroleum-based, or scrape with putty knife
- Clippers rarely last, use scissors with caution (laceration potential)

K9 Decontamination Basics

➤ Physical removal of contaminant

- Water - lukewarm, high vol, low pressure

- With soap in 3 rinse-soap-rinse cycles

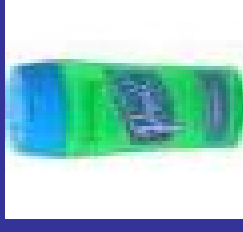
 - ★★ Dish soap (Dawn[®], Palmolive[®])

 - ★★ Shampoo (Prell[®] – less soapy, easier to rinse?)

 - ★★ High pH neutralizes, dissolves

- Decon head to tail, shoulder to forelegs, back to belly, hips to hindlegs, under tail, paw pads

⚠ **Note: some hazardous materials become reactive when exposed to water; check 2008 ERG pp 342-347**



K9 Decontamination

Basics

▶ Eyes

- 👁️ **Small bottles** OTC ophthalmic rinse
ideal for gentle but steady flush stream
- 👁️ **Uncooperative?** Remove as much as possible around eyes with towelette, flush at vet check
- 👁️ **Do not** apply eye ointment until vet check
(Traps contaminant, ↑ absorption, worsens corneal damage)



K9 Decontamination Basics

- Avoid soap into eyes, nose, mouth
 - ⌘ High pH damages mucous membranes
 - ⌘ Neutral soaps nice but less effective in neutralizing chemicals
 - ⌘ Soap and water in ears promotes vigorous shaking
(don't forget your eye protection!)

K9 Decon Special Considerations

- **Chemicals that worsen if exposed to water**
 - Apply baking soda/flour to form cake, then brush/comb or wipe/brush



- **Paw pads need special attention**
 - Deep crevasses trap particles
 - Soft-bristled brush (BD E-Z Scrub 160)



- **Eye flushing for 15 minutes**
 - Important for blister, blood, and metabolic agents of concern (mustard, Lewisite, arsine, cyanide)

K9 Decon Special Considerations

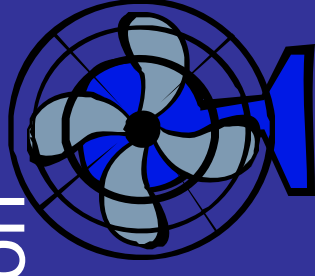
- **Bathing K9 in 0.5% hypochlorite**
 - Dilute bleach solution, follow with soap/water
 - For blistering agents and flood water decon
- **Dermal exposure to phenols**
 - All personnel wear gloves, gowns, masks
 - Blot fur and skin with paper towels before washing
- **Never use hydrocarbon-based solvents to decon an animal**
 - Defats the dermis - **Painful!**
 - Increases absorption of toxins (PCBs)



K9 Decon Special Considerations

➤ Contaminated Run-off

- Do not allow canine to drink decon run-off
- Elevate canine or provide for drainage
- Basket muzzles won't stop, can't decon face with regular muzzle



➤ Weather conditions

- Fans, shade, shelter to avoid hyperthermia
- Dryer, heater, shelter to avoid hypothermia

K9 Decon Special Considerations

➤ Post decontamination checks

HazMat safety check

- Visual inspection
- Black light
- Radiation detection

Veterinary check

- Complete physical examination
- Treatments, follow-ups as needed



Human Safety in the Decon Line

➤ Safety Officer, HazMat Specialist,
Command Staff all contribute to

decisions on PPE

➤ Additional conditions, like heat
stress and hyperthermia, are also
factored into these decisions

Human Safety PPE

- ▶ PPE for those working the decon line should be not more than one level less than that of who they are decontaminating
- ▶ Same principle applies to canine decon, as if they had PPE, despite the fact they are not wearing any
- ▶ Waterproof over-garment if using less than Level A or B



Human Safety PPE



Boots



Knee-length rubber boots,
slip-resistant soles



Gloves



Nitrile, polyvinyl chloride gloves are
good protection, durable, resist tearing
Double-gloving with outer heavy glove



Human Safety PPE

👁️ Eye protection

- Tight fitting goggles against splash hazards
- Safety glasses not protective enough

⌘ Respiratory protection

- N-96 Particulate respirators protect from spray mists
- Other as deemed appropriate by safety/HazMat



Human Safety – Physical Strain

Back & knee injuries common
when dealing with animals



- Decontamination procedures may require much bending, back/knee strain
- Consider proper posture, knee-pads, raising a platform upon which the canines stand for their decontamination

Going Through Decon Line

➤ Medical Assessment

➤ Preparation

➤ Rinse - Wash

➤ Drying

➤ Antimicrobial Station Option

➤ Monitor, Treat, Return to Service



Going Through Decon

Assessment: Emergency or Non-Emergency

- ♥ Emergent, contaminant not life threatening:
gross emergency decon, medical attention
- ♥ Emergent, contaminant removal part of treatment:
technical emergency decon, medical attention
- ♥ Non-emergent: gross and/or technical decon
performed based on contaminants involved

Going Through Decon

Handler should accompany canine

- 🐕 If unable, another experienced handler best
- 🐕 If canine cannot be taken safely without handler, confine to contain contamination
- 🐕 If handler needs decon, confine canine until handler clean, dons PPE, can take through
- 🐕 Handler unavailable, no other can, confine, consult for options: gross decon in kennel, sedation

Going Through Decon

Preparation

- 🐕 **Remove K9 equipment/gear** to container
Cleanse (bleach), dispose
- 🐕 **Maintain control**, stay in corridor confines
So as not to spread contaminant
- 🐕 **Muzzle** for safety, prevent drinking?
Basket versus nylon, pros and cons

Going Through Decon

Rinse – Wash Cycles

- Initial gross decon water removal of bulk of contaminant (powder, water-reactive, caked)
- Wipe/wash head/face, inner ears
- Eye flush if practical
- Wash - rinse X 3 head to tail



back to toes



Going Through Decon

Drying

The body shake is inevitable

- ⚠ Weather-related pitfalls to consider
 - ☀ Warm weather hyperthermia: shade, fan
 - ❄ Cold weather hypothermia: shelter, dryer



Going Through Decon

Antimicrobial Station Option

For suspected biological contamination
Spray, bathe, or walk through solutions

- ❖ Hypochlorite (bleach) @ 100-500 ppm or 0.5%; rinse afterwards
- ❖ Biguanide (chlorhexidine) @ 0.05-4%
- ❖ Quarternary ammonium @ 400 ppm or 0.1-2%
- ❖ Iodophore (povidone-iodine) @ 100 ppm
- ❖ Peroxygen @ 20 g/L or 1%
- ❖ Alcohol (ethyl, isopropyl) @ 70%

Going Through Decon

Monitor, Treat, Return to Service

- 🐾 Monitor for contamination
- 🐾 Special check of eyes, ears, nose, throat, paws, under tail
- 🐾 Repeat decon if need, new collar/leash
- 🐾 Complete veterinary exam, treat, monitor
- 🐾 Return to service



Decontamination

Corridor

Stations, modify as needed

➤ Equipment Removal Station

➤ Washing Station

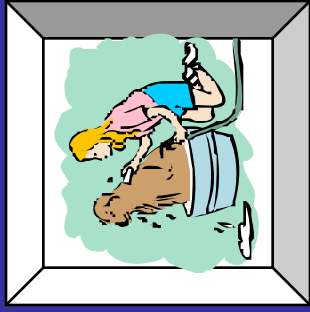
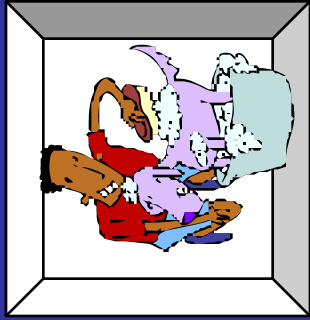
➤ Rinsing Station

➤ Antimicrobial Station

➤ Drying Station

K9 Decontamination Corridor

Hot Zone to Cold Zone



Drop Bucket → Washing Pool → Rinsing Pool → Foot Bath → Drying Area → Vet Check

HazMat Specifics





➤ Chemical Exposure

➤ Biological Exposure

➤ Radiological Exposure

Chemical Exposure Decon

Remove

-  Relocate to ventilated upwind area
-  Remove, replace gear (metal, nylon)
-  Liquid: pinch/blot, not rub (just spreads)
-  Powder: dampen, then remove (brush, wipe)

Wash

-  High volume, low pressure lukewarm water
-  Don't delay for lack of soap or warm water

Monitor

-  Veterinary evaluation, monitor, recheck



Biological Exposure Decon

Remove, Wash, Monitor as for Chemical

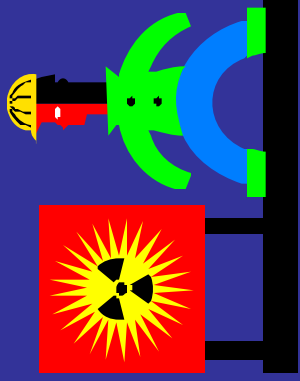
- ☹️ Concern is likely to go unnoticed until symptoms develop
- 😊 Good news – dogs resistant to most biological weapons
- ☹️ Bad news – they can still be vectors, so decontamination important

Radiological Exposure Decon

Remove, Wash, Monitor as for Chemical

- **Alpha radiation** masked by water, so thorough drying before monitoring

- **Careful** not to aerosolize particulates (α and β)



Petroleum-Based Contaminants

‘Like Dissolves Like’

A method for decontamination
of oil-based substances was
tested and confirmed at drill

MA TF-1 Drill: Oil-Based Decon

Test Material: oil-based non-toxic product



Glo Germ[®]
Powder



Glo Germ[®]
Liquid



Canine
'Contamination'

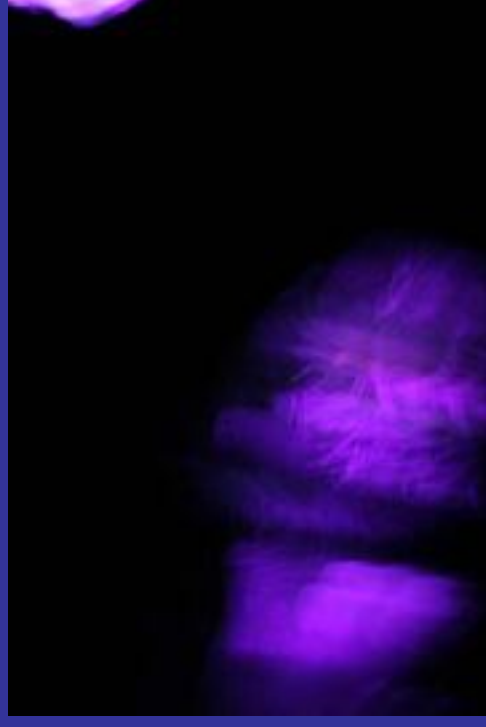
Drill: Soap and Water Decon



Soap/water decon
Attention to paws



Confirmation of
contamination



Paw still contaminated
after soap & water

Drill: Like Dissolves Like

Mineral Oil sprayed onto paws



Pre-decon
Contamination



Post oil-soap-water
Complete decontamination

Decontamination

System Designs

- Canines in a Human System

- Canine-Design System

- Field Test

K9 in Human Gross Decontamination System



Enter after initial blotting of visible contaminate.
Wash as long as deemed appropriate by staff.

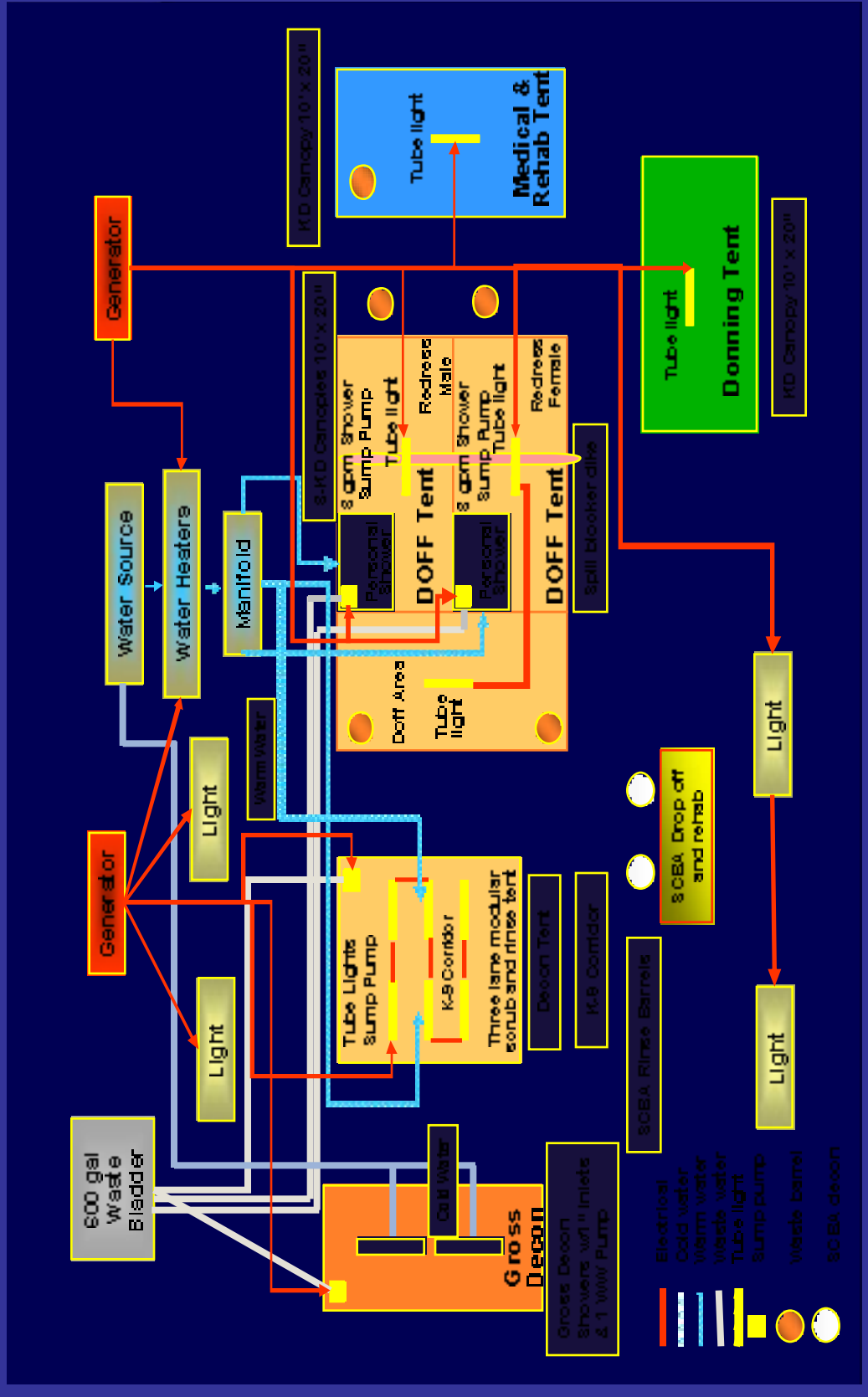
K9 in Human Technical Decontamination System



TVI Technical Decontamination System

K9 Addition to FEMA US&R

Decontamination Floor Plan



Canine System

Design

MA TF-1 US&R system
development for search

canine decontamination unit

MA TF-1 K9 Decon System

Materials and cost (2007/2008)

■ TVI Corp www.tvicorp.com	2 TVI canine pools@ \$400 ea	\$800
■ Home Depot	4 plastic shelving units	\$ 70
■ Home Depot/Lowes	Sump pump for waste removal	\$ 70
■ Dri Dek: www.dri-dek.com	12 Dri-Deck 12" x12" panels	\$ 60
■ Local hardware store	2 lengths of rope	\$ 5
■ Local hardware store	Plastic cable ties	\$ 5
■ Local hardware store	1 plastic sheet	\$ 10
■ Local hardware store	2 Hoses	\$ 20
■	Wash Hose & Wand	\$ 25

MA TF-1 K9 Decon System



One shelf unit

Light-weight plastic



TVI Pools

Hose ports for run-off

MA TF-1 K9 Decon System



Non-slip flooring

Altered shelf unit

MA TF-1 K9 Decon System



Corridor boundary guide

MA TF-1 K9 Decon System



Pool assembly



Shelf placement
with plastic over-sheet

MA TF-1 K9 Decon System



Search canine 'Uber' checks out the system

MA TF-1 K9 Decon System

System Advantages

- ✦ Inexpensive - <\$1100
- ✦ Light weight - 47 lbs/21 kg
- ✦ Compact - pools 4'x10', shelves 2'x3'x1.5'
- ✦ Durability - low cost to replace parts
- ✦ Easy to assemble - 10 minutes
- ✦ Reusable



MA TF-1 K9 Decon System

System Advantages

- 🐕 Contain run-off - port holes for hoses
- 🐕 Personnel safety - knees, lower back
- 🐕 Better K9 decon - easy reach paws, belly
- 🐕 Contaminated water - out of reach
- 🐕 PPE suit protection - no kneeling/tearing

Canine System Field Tested

Human remains search
conducted after fire with
additional asbestos and
other hazardous materials



K9 Decon System Field Tested



Gloucester Fire



HRD Canine Search

K9 Decon System Field Tested



Decontamination
Tent



Water Heater

K9 Decon System Field Tested



Canine Decontamination

K9 Decon System Field Tested

Comments

- 🐕 State trooper's canine did well
 - A little wobbly on the platform
 - Familiarization training needed
- 🐕 One pole broke at base, taped
- 🐕 Tent also had heat to decrease
hypothermia potential

K9 Decontamination Kit

- General Equipment
- Human PPE
- Decontamination Supplies
- Canine Supplies



K9 Decon – General Equipment

- Box Container
- Waterproof tarp
- Industrial plastic bags
- Hose
- Spray nozzle, wand
- Buckets
- Water heater
- Pools
- Shelving
- Shallow pan



K9 Decon - Human PPE Equipment

- Eye protection - goggles
- Gloves - nitrile, polyvinyl, +/- overglove
- Masks - particulate
- Tyvek suits or situation equivalent
- Rubber boots - knee length, overboots



K9 Decontamination Supplies

- Absorbent Item - baking soda, cornstarch
- Liquid Soap - dish soap; Prell®
- Dog Shampoo - reestablish coat
- Mineral Oil - dissolve petroleum-based
- Spray bottle - easier min oil application

K9 Decontamination Supplies

- Scrub brushes - BD E-X Scrub 160
- Eye rinse - saline, purified water
- Moist towelettes - baby wipes
- Large absorbent towels



Canine Supplies

- Leashes - disposable, double for collar
- Fans - drying, prevent/treat heat stress
- Dryer - drying, prevent hypothermia
- Emergency blanket
- Scissors - use with caution
- Muzzles - nylon, basket



References



- www.usarveterinarygroup.org
- www.avma.org/avmacollections/disaster
- www.aspca.org
- Protection, Decontamination, and Medical Aid for K9 Teams (EAI Corp)
- US&R WMD Enhanced Ops (FEMA)

Thank You

A dog can make you better
Than you've ever been before
You ask them for their all
and then

They give you so much more

