

# 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:

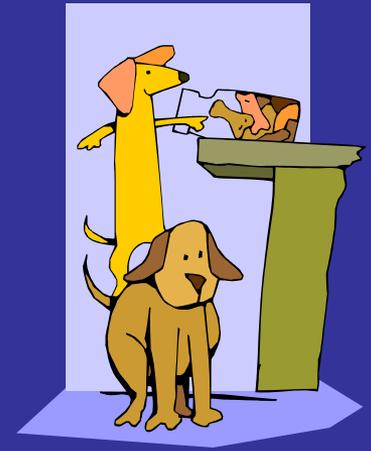
Traps contaminants, inflammatory mediators and lung defense mechanism advantages



# 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



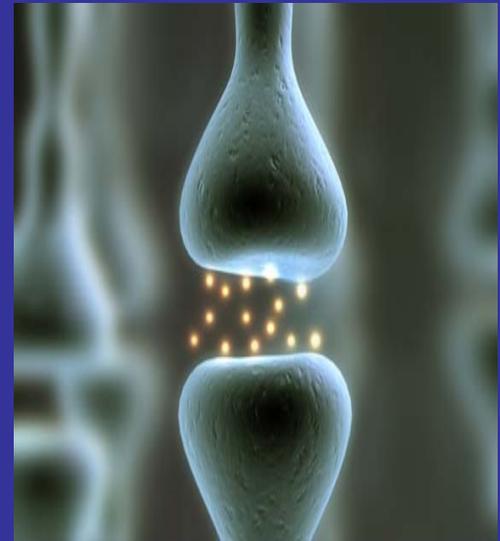
### Sarin (GB)

- $\frac{1}{4}$  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

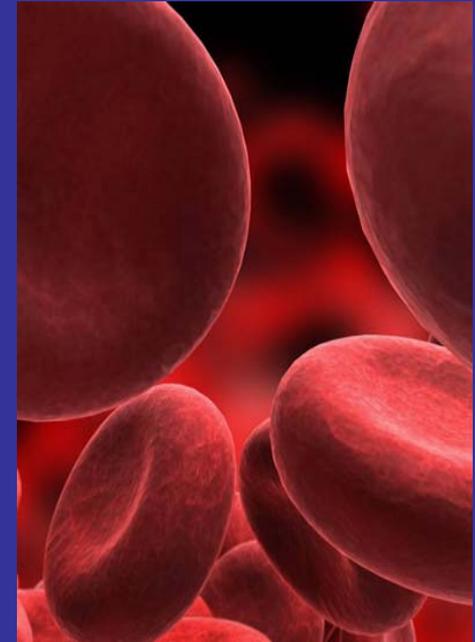
### ☠ Hydrogen Cyanide (AC)

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

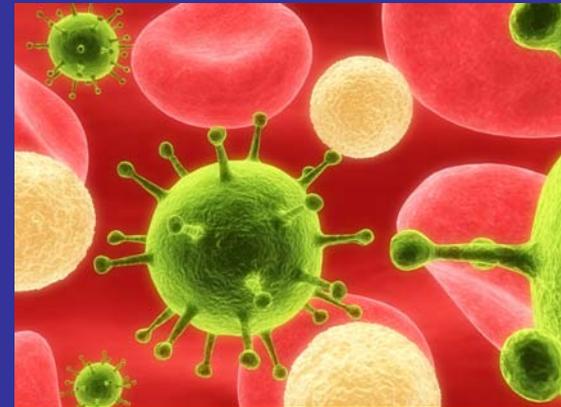
## 5 Riot Control Agents

### ☠ 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

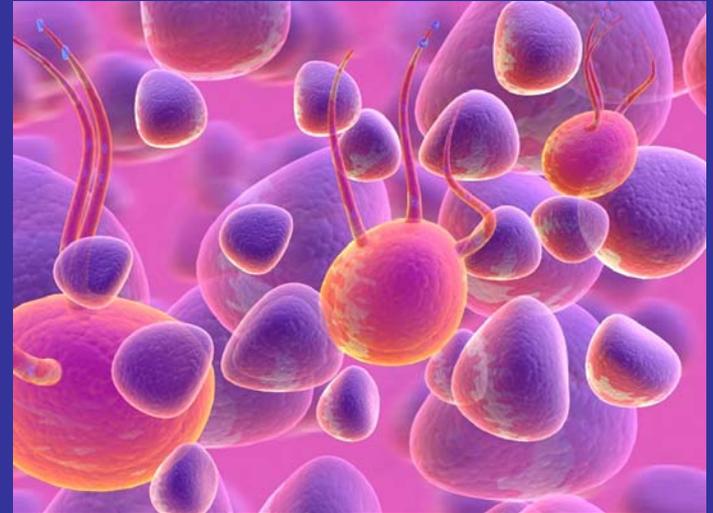
# Biological Agent Sensitivity

## ⚡ 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

- ☠ Botulinim
- ☠ Ricin
- ☠ Staphylococcal Enterotoxin B



*Castor Beans*



*Ricinus communis*

# 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

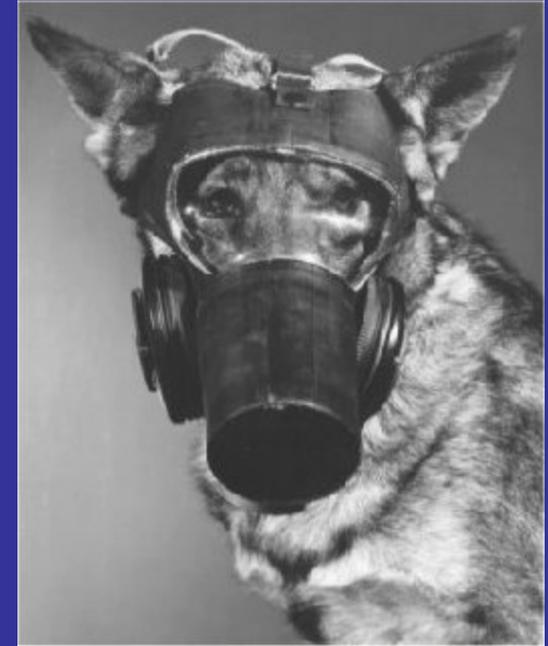
- Middle & internal similar to human, canal differs
- Advantages
  - ⌘ Floppy cartilages some protection to canal
  - ⌘ Canal 90° turn, adds protection to ear drum
- Disadvantages
  - ⌘ No ear protective equipment worn
  - ⌘ Upright cartilage open to exposure



# 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

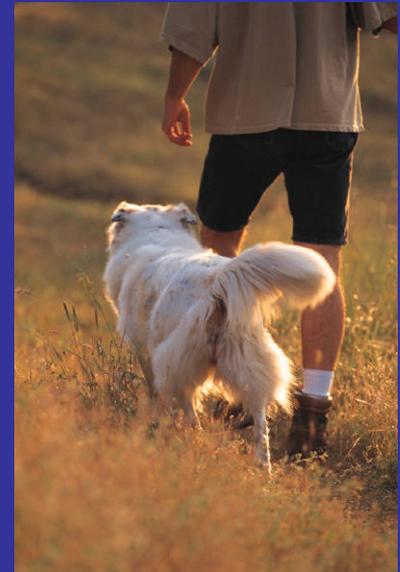
- Different distribution and thickness than humans
- Advantages
  - 🐕 Traps particles, protecting skin
- Disadvantages
  - 🐕 More difficult to decontaminate
  - 🐕 Skin wounds more difficult to detect



# 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



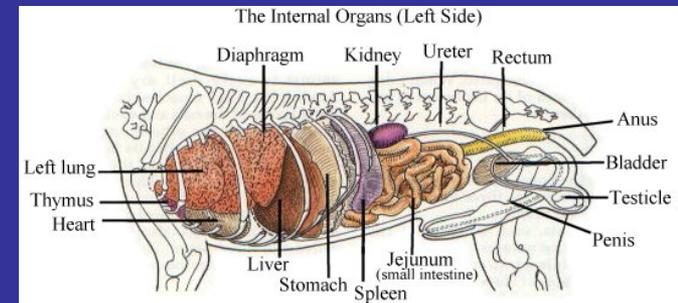
# K9 Metabolic Considerations

## ■ 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

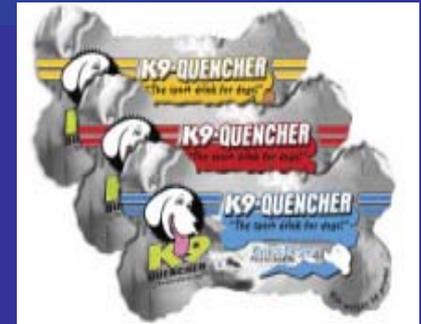
Minimizing facial contamination  
and oral absorption

- ∞ 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](http://www.bt.cdc.gov)
- CBRNE @ [www.bigmedicine.ca/toolsGregoryBanner.htm](http://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<sup>®</sup>, Palmolive<sup>®</sup>)

  - \*\* Shampoo (Prell<sup>®</sup> – 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 hypothermia, 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



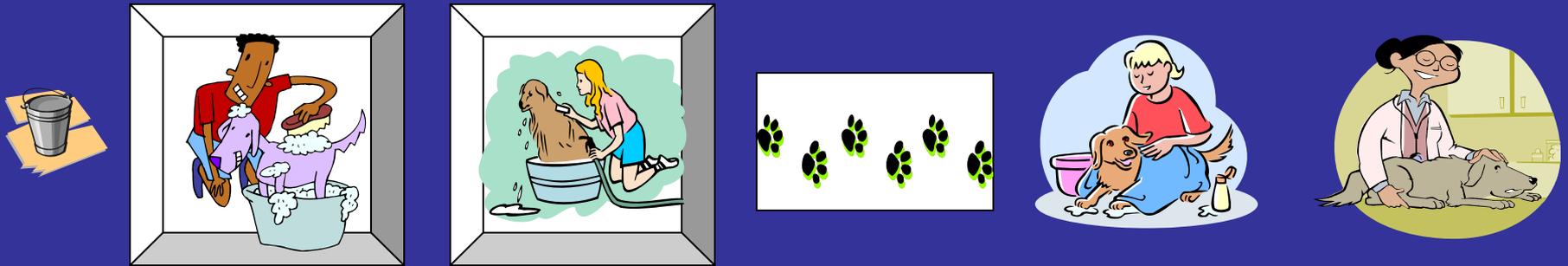
# Decontamination Corridor

Stations, modify as needed

- Equipment Removal Station
- Washing Station
- Rinsing Station
- Antimicrobial Station
- Drying Station

# K9 Decontamination Corridor

Hot Zone to Cold Zone



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

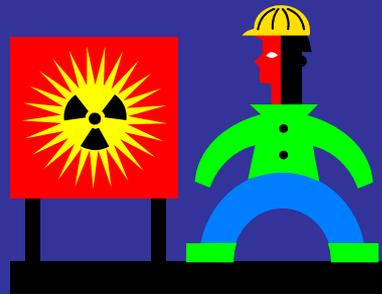
Remove, Wash, Monitor as for Chemical

- ☹️ 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 ( $\alpha$  and  $\beta$ )



# 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<sup>®</sup>  
Powder



Glo Germ<sup>®</sup>  
Liquid



Canine  
'Contamination'

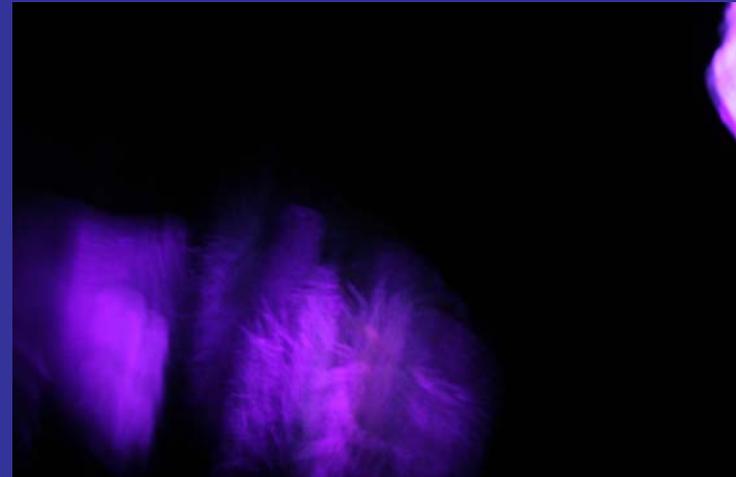
# Drill: Soap and Water Decon



Soap/water decon  
Attention to paws



Confirmation of  
contamination



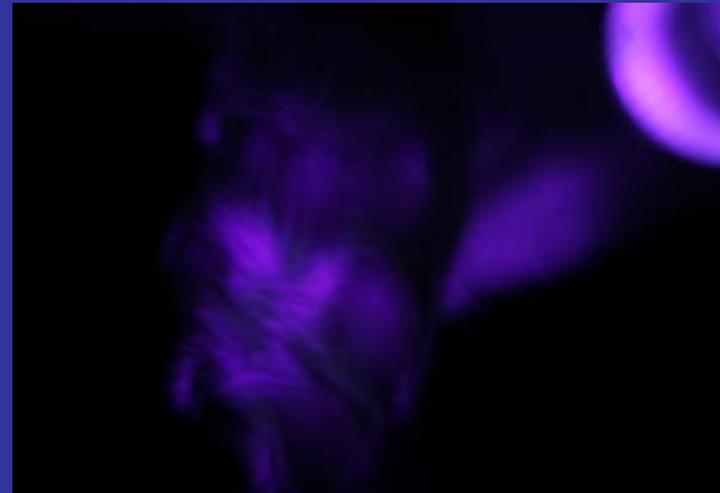
Paw still contaminated  
after soap & water

# 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



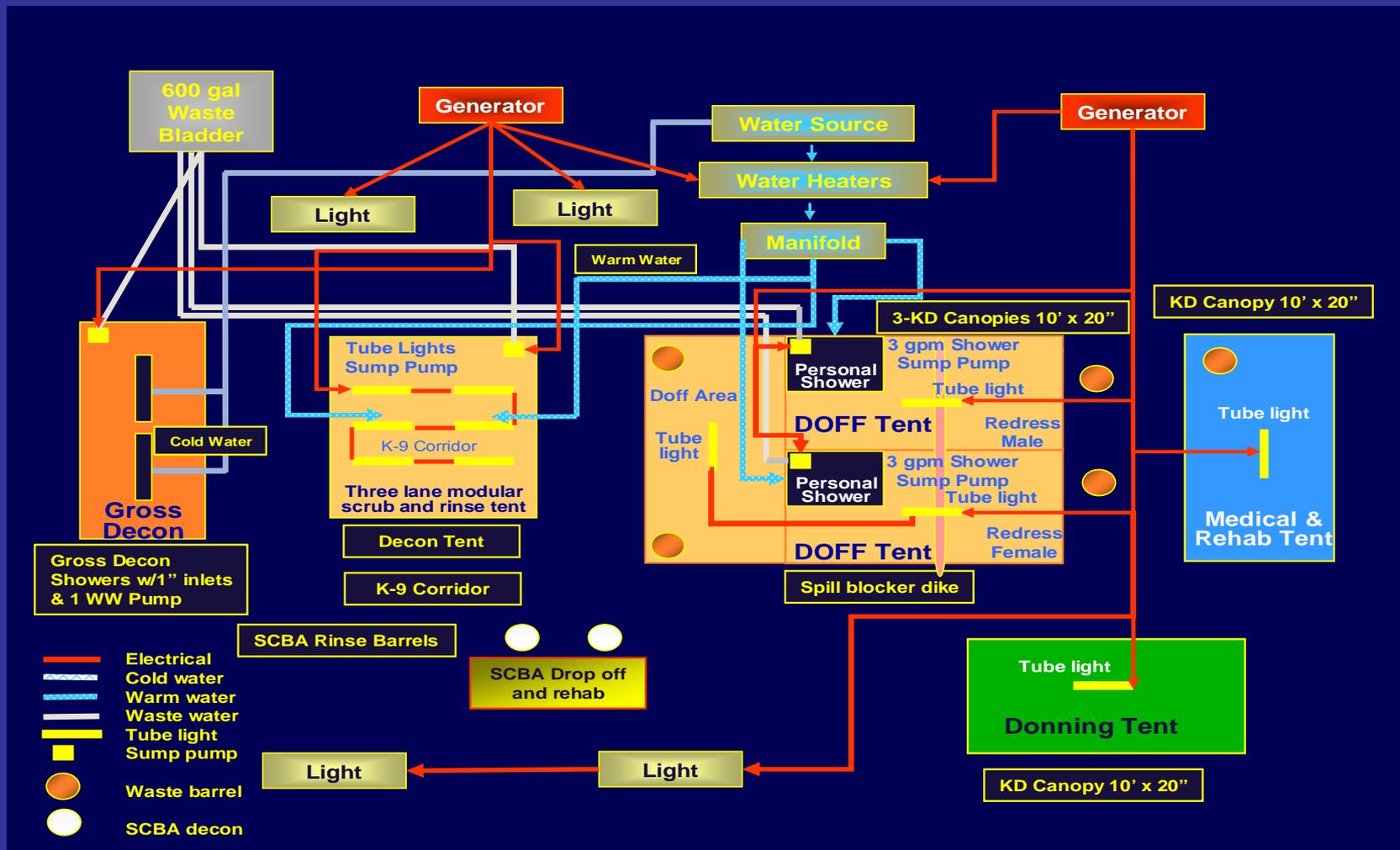
Enter after initial blotting of visible contaminate.  
Wash as long as deemed appropriate by staff.

# 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 <a href="http://www.tvicorp.com">www.tvicorp.com</a>	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: <a href="http://www.dri-dek.com">www.dri-dek.com</a>	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

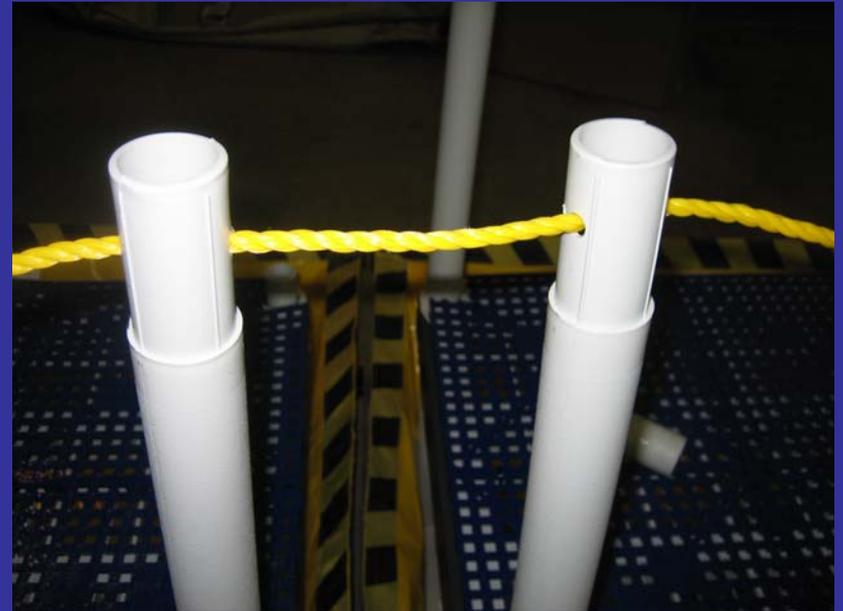


Non-slip flooring



Altered shelf unit

# MA TF-1 K9 Decon System

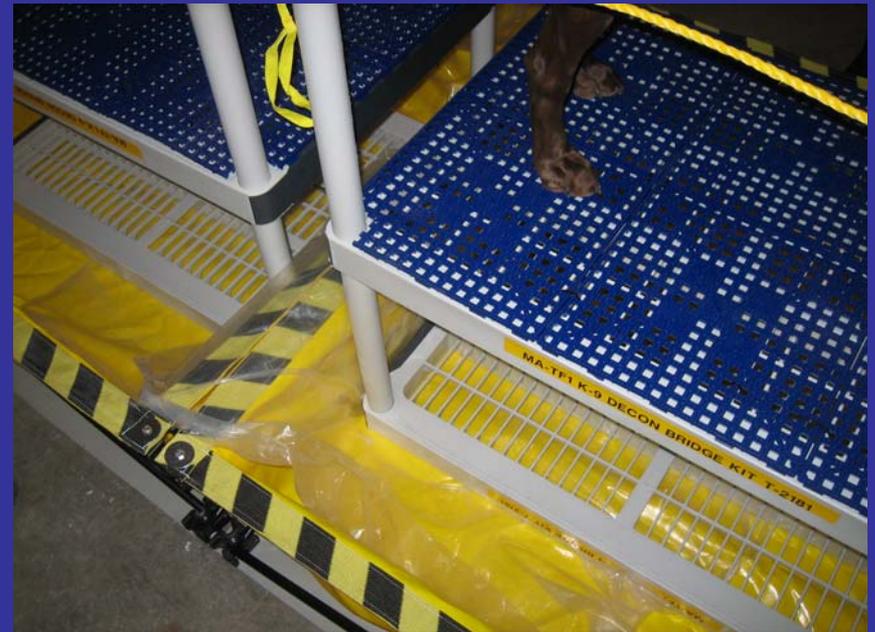


Corridor boundary guide

# 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<sup>®</sup>
- 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

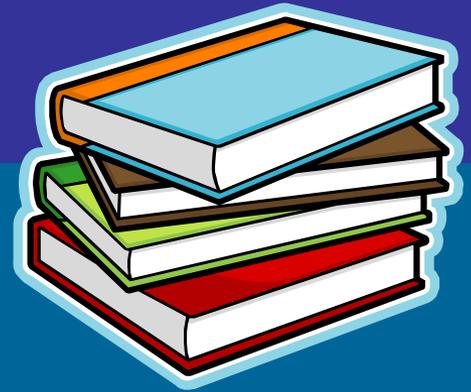


# Canine Supplies

- 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](http://www.usarveterinarygroup.org)
- [www.avma.org/avmacollections/disaster](http://www.avma.org/avmacollections/disaster)
- [www.aspca.org](http://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