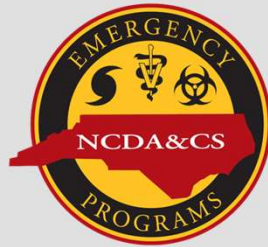


# Safety & Biosecurity

## Module 3



- Welcome to the North Carolina Veterinary Response Corps training module 3, Safety & Biosecurity.

## Topics

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- Physical and Responder Safety
- Hazards
- Animal Safety
- PPE
- Biosecurity

- This module will cover an overview of general safety and biosecurity principles in addition to animal specific considerations encountered during a disaster or emergency

## **Responder Safety**

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- Responder safety is paramount
- General protocols assigned by the Incident Management Team (IMT) Safety Officer
- Working area may not always be ideal
- Each disaster presents different risks
- Operating alongside other disaster and emergency operations
- Do not engage in any activity you are not trained in

- Responder safety is the number one priority during deployments
- The Safety Officer in the IMT and/or a Site Safety Officer where you are deployed will develop a safety briefing that all responders should be aware of
- Response locations can vary and may not always be in an ideal working space. You should be prepared to adapt to the situation to provide care as needed in the incident.
- Adaptability does not mean you need to work in unsafe conditions for you, your staff, or any animals you are treating.
- You may receive disaster or animal specific safety and biosecurity reminders from the VRC for the deployment
- Make sure to be educate others if needed about the safety considerations working with and around animals

## Physical safety

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- Maintain situational awareness
- Understand your limits
- Determine needed vaccines & other medical requirements
- Abnormal working periods and hours
- Recognize fatigue, stress, and other medical conditions

- Maintaining situational awareness is important because you are working in abnormal environments and may be using sharps or exposed to other hazards in your work area
- Know your physical limits and do not overcommit. You could be risking those around you by overcommitting. Discuss medical issues of concern with your doctor to determine your deployment abilities.
- Maintain up-to-date status for any recommended vaccines
- Deployments can last for consecutive days and may require you to work for more than 8 hours in a day
- Recognize when you may be getting fatigued so you can take a break or seek any medical assistance

## Hazard - Bites

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- Animal bites & Rabies risk
- Unknown medical history
- Handle all animals carefully
- Report any bite immediately to a local Animal Control Officer and IMT Safety Officer
- Initiate wound care
- Follow same protocol as daily practice

- Rabies and other zoonotic diseases are a significant hazard in post-disaster situations.
- Animal health and other responders are at an increased risk for rabies exposure from contact with unknown and/or undocumented rabies status animals
- Highly recommend making sure you are vaccinated for rabies, or your titers are adequate
- The incidents need to be reported immediately to begin medical care and appropriate paperwork

## **Hazard - Environmental**

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- Wildlife
- Insects
- Snakes
- Other free-ranging animals
- Weather patterns

- Learn what wild animals are common in the area you are working
- Watch out for ticks, mosquitoes, ants, and other stinging insects and use repellants
- Be aware of venomous snakes post natural disasters
- Stay weather aware of what conditions you may be working in whether it be hot, cold, humid, rain, etc.

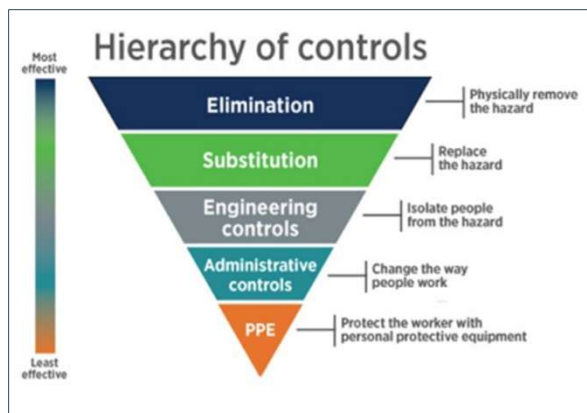
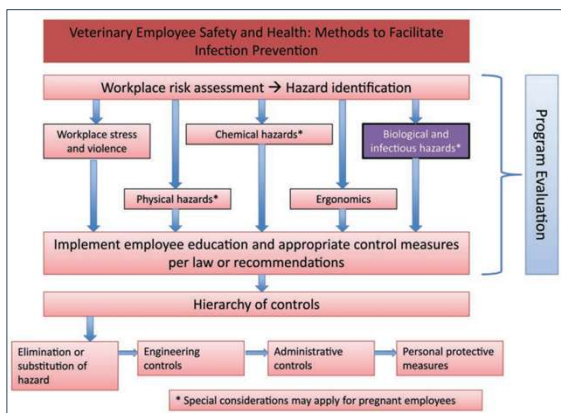
## Animal Safety

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- Emergency interactions  $\neq$  day-to-day interactions
- Engage with proper training
- Animals can be fomites and pathogens  $\rightarrow$  USE PROPER PPE
- Maintain awareness of surroundings and the patient behavior
- Look out for those around you
- NIOSH Identified Hazards
  - Bites
  - Scratches
  - Crushing Injuries
  - Exposure to zoonotic organisms
  - Injuries from sharp, jagged debris
  - Heavy lifting injuries

- Animal interactions during a disaster or emergency can be very different than a non-stressful situation. Emergency/disaster animal handling may not equal fear/stress free handling. It is more important to keep the animal safely restrained and contained and move to a safer location to complete further assessments.
- Do not put yourself into a situation for which you are not trained or comfortable navigating.
- Animals may present with significant contamination on their fur, hair, feathers, etc. or may be shedding opportunistic pathogens if stressed or ill.
- Like practice, be aware of the surroundings you are working in and how the animal is reacting.
- Be hyperaware of animal behavior during emergency situations and be hyperaware for those around you also.
- Animal health professionals are the subject matter experts for animal behavior and how to work safely around animals, whether sedated or not.
- List of NIOSH identified health and safety hazards. \*Need a reference link here\* <https://www.cdc.gov/niosh/veterinary/about/hazards.html>

# Controls for Safety



- NASPHV Hierarchy of controls for methods to facilitate infection prevention among veterinary practice employees.  
<https://www.nasphv.org/Documents/VeterinaryStandardPrecautions.pdf>
- NASPHV = National Association of State Public Health Veterinarians
- The hierarchy of controls identifies a preferred order of actions to best control hazardous workplace exposures. These are used to develop PPE and safety recommendations. <https://www.cdc.gov/niosh/hierarchy-of-controls/about/index.html>
- NASAAEP Disaster Veterinary Medical Best Practices - [https://0d2dd679-221b-44d3-bedb-c7652019a91f.filesusr.com/ugd/8b3e05\\_8bc7d443e1d741a68dca01b0f25f781b.pdf](https://0d2dd679-221b-44d3-bedb-c7652019a91f.filesusr.com/ugd/8b3e05_8bc7d443e1d741a68dca01b0f25f781b.pdf)
- NASAAEP = National Alliance of State Animal and Agricultural Emergency Programs

## **Personal Protective Equipment (PPE)**

- Animal health professionals use PPE on a regular basis
- PPE choices are based on evaluation of risk and exposure for the incident or agent
  - Identify hazard(s)
  - Assess probability and means of exposure
  - Assess consequences of exposure
    - To yourself and others
    - To any animals or animal products
    - +/- zoonotic
- Appropriate PPE will be identified for use with each assignment
- Direct concerns to the IMT Safety Officer

## Levels of PPE

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- **Level D** (lowest): Protects against nuisance contamination
  - Non zoonotic, vector borne, no respiratory hazard
- **Level C**: When concentration and types of airborne substances are known and criteria for using air purifying respirators are met
  - HPAI
- **Level B**: When highest level of respiratory protection is necessary but lesser skin protection than level A
  - Nipah virus
- **Level A** (highest): When the greatest level of skin, respiratory, and eye protection are required
  - Chemical spills

- Safety Officer in the IMT will help determine the level of PPE needed for the response.
- Veterinary responders will rarely use Level A or Level B

# NAHEMS Levels of PPE

**Table 3. Equipment Based on PPE Level**

To protect:	Level D	Level C	Level B	Level A
Skin (dermal)	<b>Inner barrier:</b> Street clothes <b>Outer barrier:</b> Coveralls, scrubs, or other protection	<b>Inner barrier:</b> Environmental temperature dependent street clothes/scrubs to insulated coveralls <b>Outer barrier:</b> Hooded chemical-resistant clothing		<b>Inner barrier:</b> Totally-encapsulating chemical-protective suit <b>Outer barrier:</b> Disposable protective suit, if warranted
Skin - specifically hands	Disposable gloves Cut resistant gloves, if warranted	Disposable gloves, chemical-resistant outer & inner gloves Cut-resistant gloves, if warranted		Chemical-resistant outer gloves over encapsulating suit Cut-resistant gloves, if warranted
Respiratory		Air purifying respirator (APR) - Full-mask for unknown hazards & zoonoses - Half-mask for non-zoonotic	Self-contained breathing apparatus (SCBA)	
Eyes		Goggles, face shield	SCBA	
Footwear	Boots or shoes appropriate to perform duties		Chemical-resistant steel toe boots	Chemical-resistant steel toe boots over encapsulating suit
	Known hazard No risk of skin contamination No risk of inhalation No risk of hazardous material contact			Unknown hazard Skin contamination imminent Respiratory exposure imminent Eye exposure imminent

- NAHEMS = National Animal Health Emergency Management System
- NAHEMS GUIDELINES: PERSONAL PROTECTIVE EQUIPMENT (PPE), April 2011, p. 16
- [https://www.aphis.usda.gov/sites/default/files/fadprep\\_nahems\\_guidelines\\_pe\\_final\\_april2011.pdf](https://www.aphis.usda.gov/sites/default/files/fadprep_nahems_guidelines_pe_final_april2011.pdf)

## Level D

- Lowest level
- Protects against nuisance contamination
- Coveralls, boots, gloves, surgical gown, lab coat, lead gowns, etc.
- +/- safety glasses, ear plugs, etc.
- Suitable for day-to-day activities



- This type of PPE is appropriate for day-to-day activities and for responding to non-zoonotic, vector borne animal disease with no respiratory hazard
- This level would be appropriate for Foot and Mouth Disease outbreak work

## Level C

- Concentration and type of airborne/biologic substances are known
- Chemical resistant clothing +/- hood such as Tyvek or equivalent
- Full-face or half-face air purifying respirator
- Inner & outer gloves
- Goggles or face shield



- This level would be appropriate for a Highly Pathogenic Avian Influenza responder to don for working in that area.
- Suitable for most disease investigations
- You can see in the picture this veterinarian has on a Tyvek suit, eye protection, N95 mask, is double gloved, and has on rubber boots that can be cleaned. Boot covers can also be used if no rubber boots are available.

## Level B

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- Highest level respiratory protection needed
  - Self-Contained Breathing Apparatus (SCBA)
- Responders for chemical hazmat
- Full face SCBA respirator, chemical resistant suit, chemical resistant gloves and footwear
- This level rarely used in veterinary medicine in private practice



- This type of PPE is not commonly used in veterinary medicine in the United States. This levels would be applicable for hemorrhagic fevers, Nipah Virus, etc.

## Level A

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- Highest level of protection for respiratory, skin, and eye
- Positive pressure, full-face respirator or SCBA
- Encapsulating chemical suit, gloves, & footwear
- Levels A & B require extra training before use



- This level would be used for something like a chlorine spill.
- If an event occurs where this type of PPE is required, other trained responders will be utilized who have the training to deal with the specific incident.
- Veterinary responses will almost never require this level of PPE

## **Donning PPE**

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- Identify what level of PPE is needed for your activity
- Gather all items needed
- Inspect the items for tears or defects
- Proper donning procedure ensures safe doffing & reduces contamination
- Look for identified areas where PPE is donned & doffed
- DO NOT cross a clean/dirty line or enter a contaminated area without the correct PPE!
- Ask for help if you are unsure the of proper procedures

## Doffing PPE

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- Look for the correct areas to doff PPE
- Follow all decontamination rules prior to removing PPE
- Remove PPE in the reverse order you put it on
- DO NOT cross contaminate yourself when doffing
- Discard PPE in identified disposal areas or containers
- Decontaminate any additional materials you have with you such as phone, safety glasses, lab samples, etc.
- Again...ask for help if you need any clarification!

## PPE Considerations

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- PPE selection is a complex process for each incident due to the variation in hazard exposure
- Discuss PPE concerns with the Safety Officer & do not work in unsafe environments
- Maintain your situational awareness
- Ensure the correct fit and function of PPE before use
- Respirators such as full-face, half-face, and N95 require medical clearance and fit testing prior to use

- Do not make unilateral decisions about PPE usage or discontinuation without discussing it with IMT Safety Officer first. Respect the chain of command and adhere to the ICS structure.
- You could be exposed to environments containing pathogens or hazards outside of your normal training or experience. Staying aware keeps you and those around you safe.
- Module 10 from USDA APHIS NVAP modules discusses in more depth the types and levels of PPE. <https://www.aphis.usda.gov/nvap/training-modules>
- For more info:  
[https://www.aphis.usda.gov/sites/default/files/fadprep\\_nahems\\_guidelines\\_pe\\_final\\_april2011.pdf](https://www.aphis.usda.gov/sites/default/files/fadprep_nahems_guidelines_pe_final_april2011.pdf)

## General Biosecurity

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- Policies and measures taken to protect from biological harm
- Ultimate goal: prevent and limit spread of harmful agents
- Exposure to zoonotic & other diseases is of significant concern
- Protocols that protect you daily and contain disease in emergencies
- Exposure through contact, aerosol, vectors
- Simple steps such as handwashing & clean work areas can go a long way
- IMT Safety Officer consultation

- Like safety considerations, there will be general principles and then incident specific protocols
- It is critical to adhere to developed and assigned protocols to avoid any disease outbreaks and protect both human and animal health
- There may be contact with non-zoonotic disease-causing pathogens from interaction with an animal rescued from floodwater, mud, other people, and disturbed natural environments
- The local IMTs or Safety Officer may not be aware of animal issues, so you need to work with them and educate if needed about the risks of working with animals
- Decisions are ultimately up to the local officials assigned to that task

## **Animal Biosecurity**

- Utilize barriers when possible
- Avoid cross contamination between species and ill animals
- Pathogen shedding from apparently healthy animals
- Cleaners and disinfectants
- Situation appropriate PPE
- Situation & Animal specific hazards

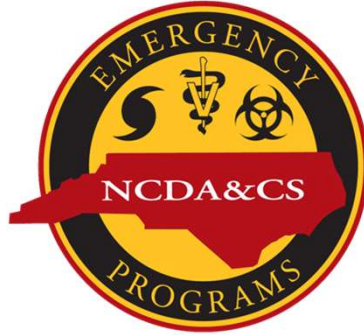
- Apparently healthy animals may be shedding pathogens due to stress of the event, transport, housing, handling, etc.
- Make sure to use the recommended cleaners and disinfectants based on the hazards identified
- At minimum, try to implement the same hygiene principles as you would in a clinic setting
- Wear the right clothing such as scrubs, coveralls, gowns, lab coats, aprons or other items that can be removed and cleaned or disposed
- Hazards may differ based on the species (be prepared to see any domestic animal or offer guidance on any domestic animal)
- Each disaster and emergency will present its own risks (disease spread in crowded situations, diseases from event stress, disease from exposure to wildlife and unvaccinated animals)
- Reach out to VRC coordinators if you need assistance working with local officials on biosecurity or other animal health concern

## Mental Health Safety

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- Any event can trigger an emotional or stress response
- Emergencies and disasters create abnormal situations
- Maintain a strong network
- Utilize resources provided by the IMT
- Talk about it with someone
- Maintain self-care routine during disasters

- It is ok to not be ok
- Talk with peers, friends, family, clergy, etc.
- As you know from practice, mental health can be significant contributor to fatigue
- Reach out for help, even if you are not sure you need it or don't think you do
- <https://nomv.org/peer-support/>
- <https://www.avma.org/resources-tools/wellbeing>



## **Prepare. Respond. Recover.**

- Thank you for completing the NC Veterinary Response Corps Module 3.
- Please advance to the following slide for the link to a short quiz to verify completion.
- If you have any questions or concerns, please reach out to VRC coordinator Dr. Dan Kish, [Daniel.kish@ncagr.gov](mailto:Daniel.kish@ncagr.gov)

## Quiz for Module 3

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- Link to Quiz

- <https://forms.cloud.microsoft/g/wBWhrd6RJU>

- QR code to access quiz



- Completion of the quiz is required to receive credit for training module 3