

Protecting Yourself from Avian Influenza



August 2007

WORKER EDUCATION & TRAINING PROGRAM



U.S. Department of Health and Human Services
National Institutes of Health
National Institute of Environmental Health Sciences



This training tool is an awareness level health and safety resource for workers, “skilled support personnel” who might come in contact with Avian Flu infected animals or contaminated materials.

This tool will help workers understand what Avian Influenza (referred to throughout as AI or Avian Flu) is and how to protect against infection and other hazards associated with an Avian Flu response at an awareness level.

Trainers may use this tool to aid in the development of an AI awareness level course or other awareness level materials (fact-sheets, table-top activities, etc).



Advanced/Additional Training for those Involved in an Avian Influenza Response

- Use of this training tool does not replace the additional duty specific training or PPE specific training requirements.
- Regardless of work scope, there are many topics covered in this training tool that have corresponding OSHA standards which must be met in order to safely and legally perform associated job duties.

Contact the NIEHS National Clearinghouse for Worker Safety and Health Training for information on advanced training on Avian Influenza response at 202-331-0060.



Employer and Worker Responsibilities

Employers and workers have responsibilities under the OSH Act.

- The Occupational Safety and Health Act requires that employers provide a safe and healthful workplace free of recognized hazards and follow OSHA standards. Employers' responsibilities also include providing training, medical examinations and recordkeeping.
- Workers must follow the employer's safety and health rules and wear or use all required gear and equipment; follow safe work practices for your job, as directed by your employer; report hazardous conditions to a supervisor; and report hazardous conditions to OSHA if employers do not fix them.



Module 1

Avian Influenza Awareness



Introduction to Avian Influenza

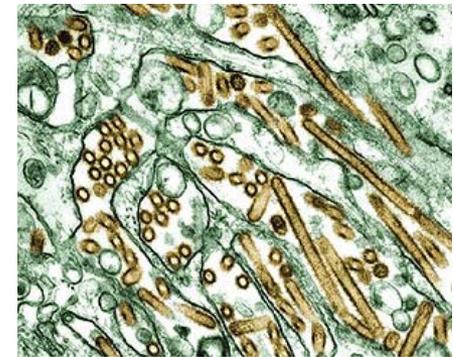
- What is avian influenza (AI)?
- How is it transmitted?
- What are the symptoms?
 - In birds
 - In humans
- What is the difference between AI and seasonal flu?
- What is the difference between AI and pandemic flu?





What is Avian Flu?

- Avian influenza (AI) is a viral disease that affects wild (ducks, geese, sparrows) and domestic birds (poultry, pet birds) throughout the world and can cause illness and death in birds and humans.
- The disease can vary from mild to severe, depending on the virus strain involved.
- The mild strains are called low pathogenic avian influenza (LPAI). This strain has can cause mild symptoms in humans. Pathogenic means able to cause disease.
- The most severe strains are called highly pathogenic avian influenza (HPAI), also know as high path, and includes the H5N1 virus. This strain is known to be deadly in humans and birds.
- Human cases have occurred in people who had close contact with sick birds and contaminated materials.



AI virus

Workers must be protected against LPAI and HPAI!



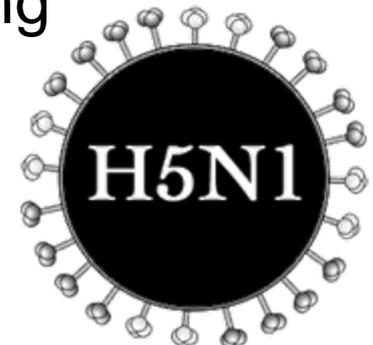
How is Avian Flu Transmitted?

- The virus is present in the feces and secretions from the nose, mouth, and eyes of infected birds.
- Avian influenza is spread primarily by direct contact with infected feces and body fluids from infected birds.
- Contact with infected fecal material is the most common means of bird-to-bird transmission.
- Materials (such as feed and bedding) and equipment may become contaminated.
- AI has also been reported in other mammals such as cats, dogs and ferrets.



Transmission of AI (continued)

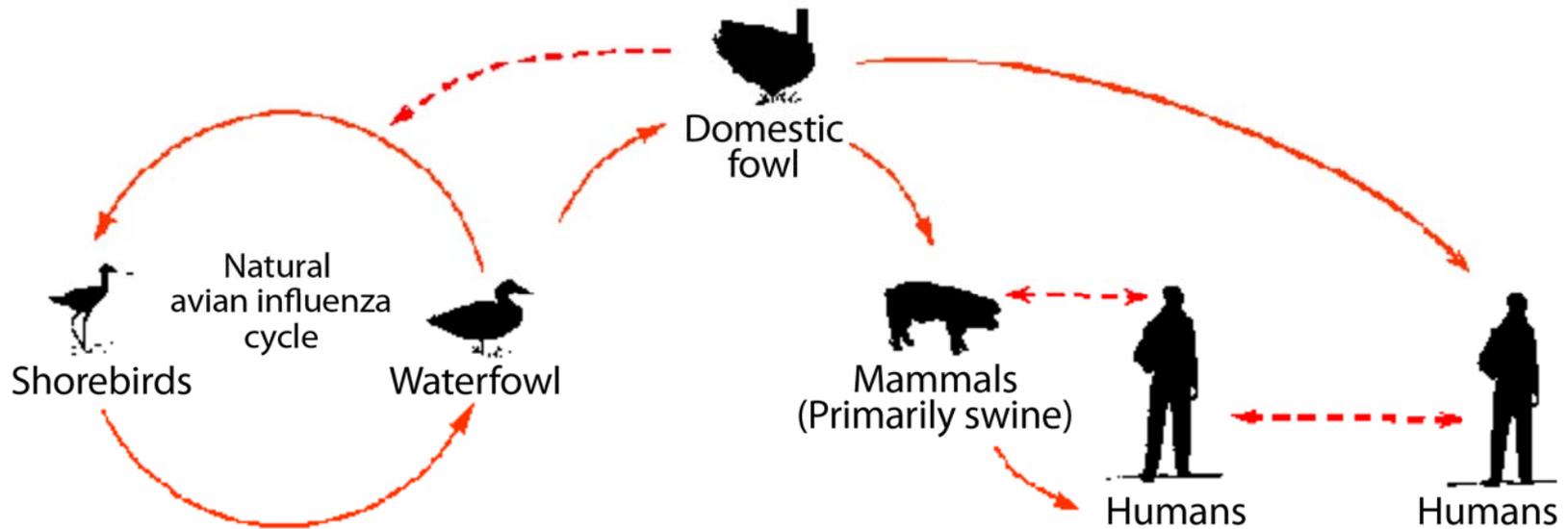
- Humans can become infected with avian influenza by:
 - Direct contact (eyes, open wound, mouth, etc.) with body fluids and feces from infected birds
 - Eyes are a particularly easy route of entry for the virus. Use eye protection!
 - Inhaling dust containing contaminated material, body fluids or feces
- There is currently limited evidence concerning human to human transmission.





Transmission of AI (continued)

Current and future concerns about the transmission of avian influenza virus (H5 N1)





What are the Symptoms in Birds?

In birds look for:

- Depression and droopiness
- Ruffled feathers
- Excessive thirst
- Loss of appetite
- Sudden death
- Swollen or bluish wattles and combs
- Watery diarrhea that changes from bright green to white in color
- Coughing, sneezing, and nasal discharge
- Deformed eggs or production reduction or stoppage in hens
 - Last eggs laid often have no shells
 - Soft-shelled or oddly shaped eggs



Discolored wattle of infected bird on right



What are the Symptoms in Humans?

In humans look for:

- Fever
- Cough
- Sore throat
- Muscle aches
- Eye infections
- Pneumonia

If you encounter someone with these symptoms:

- Keep your distance from this person
- Encourage them to get medical treatment





What is the difference between AI and seasonal flu?

It is important to note that avian influenza, seasonal influenza, and pandemic influenza are not the same.

- **Seasonal (or common) flu** is a respiratory illness that can be transmitted person to person. A vaccine is available to prevent illness.
- **Avian (or bird) flu** is caused by LPAI or HPAI influenza viruses that are found naturally among wild birds. The LPAI causes a mild form of avian influenza and the HPAI causes a severe form of avian influenza in poultry.
- The H5N1 is a type of HPAI avian flu that is deadly to domestic birds. The virus can be passed from birds to humans. There is no vaccine for humans and the virus can lead to severe illness and death.



What is Pandemic Influenza?



Pandemic Flu is a highly infectious viral infection in humans that spreads easily from person-to-person, causes serious illness, and infects large numbers of people around the world or in a large region (such as the United States) in a short amount of time.

There are some documented cases of human H5N1 infection in different parts of the world. The H5N1 viral infection has resulted in death and serious illness in humans, however, the ***H5N1 virus is currently not a pandemic because it is not easily passed from human to human and it has not infected a large number of people.***

The H5N1 influenza virus could change into a new, dangerous form that is easily spread from person to person and become a pandemic disease.



Module 2

Working in Avian Influenza Infected Areas:
Controlling AI Specific Health and Safety Hazards



Emergencies in the Field

- Ask what first aid support is available during your briefing and be sure you understand where it is located.
- For minor injuries or health concerns go to:
 - Local hospitals or clinics
 - First Aid, EMT or nurse station
- For serious emergencies call 911.
 - Know your exact location
- Notify your supervisor about all injuries, illnesses and emergencies.





Incident Command System (ICS)

To effectively manage emergency situations, the incident command system will be used.

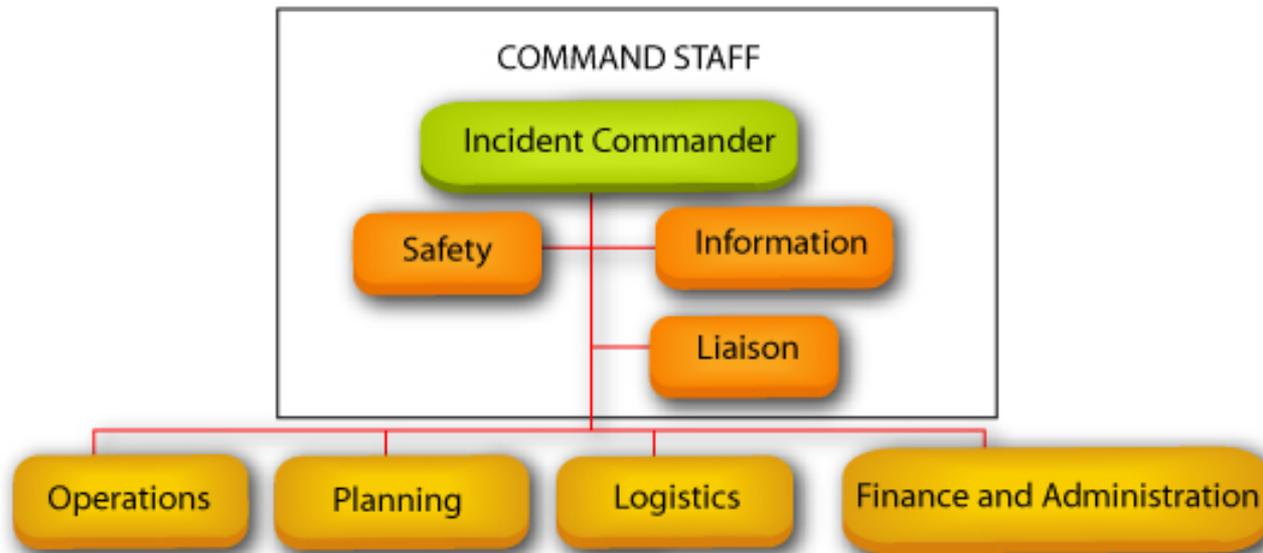
- ICS uses:

- Unity of command (one person in charge)
- Span of control to manage personnel (3-7 persons under one supervisor with 5 optimum)
- Common terms so everyone is using the same language
- A modular system to manage resources
- Life safety code
 - Protect self
 - Control incident
 - Protect property and environment





Incident Command System Structure





Protective Measures Against AI

The following practices will be used to safely and effectively manage an AI outbreak:

- Work zones
- Health and Safety Plans: biosecurity, cleaning and disinfection, decontamination, and site safety
- PPE
- Vaccination
- Sanitization (disinfection and cleaning and decontamination)
- Material Disposal (including carcasses, bedding, feed and structural materials)
- Depopulation



Work Zones

- Exclusion zone (hot zone) is the area where the AI hazards are present and only properly trained and authorized personnel may enter.
- Contamination reduction zone (warm zone) is used to remove contamination from personnel and equipment and includes:
 - Decontamination corridor (for personnel and equipment)
 - Emergency decontamination
- Support zone (cold zone) is where incident command and other support functions will be stationed.





Health and Safety Plans (HASP)

- OSHA has set regulations that require Health and Safety Plans (HASP) to protect workers involved in national response operations.* The HASP serves as a guide for employers and workers to follow during their daily operations to prevent injury, death, and the spread of disease.



*OSHA, 29 CFR 1910.120, HAZWOPER



HASP (continued)

This document covers three HASP sections that will be used on worksites in the event of an avian influenza outbreak in the U.S.: Biosecurity, Decontamination, and Site Safety. The site safety section includes general information from several of the HASP sections listed above.

All HASP cover all or most of the following:

- Introduction
- Key Personnel
- Hazard Assessment
- Training
- PPE
- Spill Containment
- Temperature Extremes
- Medical Surveillance
- Exposure Monitoring and Air Sampling
- Decontamination
- Emergency Response/Contingency Plan
- Emergency Action Plan
- Confined Space Entry
- Site Control (Biosecurity)



Biosecurity

- Biosecurity practices are followed to prevent the spread of disease, including the creation and implementation of a biosecurity plan.
- A biosecurity plan is a set of procedures that are followed during daily operations to prevent the spread of disease at a worksite and should include:
 - Prevention of AI
 - Detection of AI
 - Quarantine of AI infected birds and materials
 - Control of AI outbreaks
- Workers should follow the decontamination plan and cleaning and disinfecting procedures in the site's biosecurity plan to avoid carrying the AI virus off their worksite.





Personal Protective Equipment (PPE)

Depending upon your work site's PPE program and your assigned job task, any of the following PPE may be required:

- Protective suit - from standard coveralls with impermeable apron for low biological and chemical exposures to a liquid impermeable splash suit for high exposures around infected birds and high chemical exposures
- Respirator - from an N-95 for low exposure work to PAPR for high exposure and strenuous work
- Protective washable or disposable footwear
- Inner nitrile or vinyl disposable glove and disposable outer cut/abrasive resistant work glove or heavy-duty rubber work glove that can be disinfected



PPE (continued)

- Fully enclosed goggles
- Disposable head or hair cover to keep hair clean
- Ear protection in noisy areas
- Head protection if in construction or demolition zones
- Be sure to follow your work site's PPE program

OSHA has specific PPE Standards: 29 CFR 1910 Subpart I, that employers must follow when selecting and placing employees in protective equipment.



PPE Examples



Safety glasses



Safety Goggles



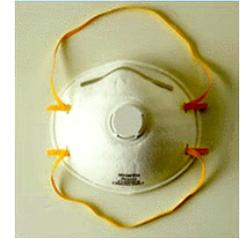
Level C PPE with tyvek splash suit and APR respirators



Example of Leather gloves
Courtesy Kirkwood



Example of Nitrile gloves
Courtesy Kirkwood



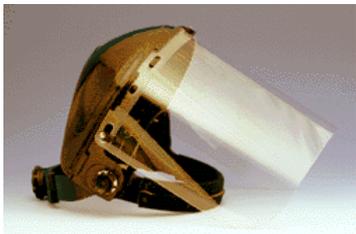
N-95 respirator



1/2 face APR



Full face APR



Face Shield



PAPR



Vaccination Against AI

- There currently is no vaccination for AI in humans.
- The U.S. Centers for Disease Control and Prevention (CDC) recommends that unvaccinated workers receive the current season's influenza vaccine.
- CDC recommends that workers having direct contact with infected birds or surfaces contaminated with respiratory secretions or feces from infected birds should have a seasonal influenza vaccination.





Disinfection and Cleaning

- Disinfection and cleaning involves the use of sanitizers and/or disinfectants to destroy the AI virus from an area or surface.
- Sanitizers and disinfectants are chemicals used to destroy unwanted contaminants such as bacteria, fungus, and viruses.
- The HASP for your worksite will determine the sanitizing chemicals and disinfection methods for workers to use.
- Workers should understand the hazards, type of PPE to be used, and the best uses for the sanitizers.





Decontamination

- Decontamination or decon is the process of removing, destroying, or reducing the activity of materials such as toxic chemicals or viruses that could endanger an individual or the environment. Decontamination of personnel is necessary to keep the virus from spreading to other locations.
- In the event of an avian influenza outbreak, the heaviest contamination will occur when:
 - There is physical contact with infected animals
 - Animals are euthanized (killed because they are infected or dying)
 - Carcass disposal occurs
 - Manure, bedding, and debris from equipment are removed





Decontamination (continued)

A decontamination plan should include:

- Training
- Location and layout of decontamination stations and areas
- Decontamination methods
- Required decontamination equipment
- Standard Operating Procedures (SOPs) to minimize worker contact with contaminants during decontamination
- SOPs for decontamination line personnel
- Procedures for collection, storage and disposal of clothing, equipment and any other materials that have not been completely decontaminated
- Dispose of PPE and decon/disinfection solutions as contaminated waste
- Ensure adequate personal washing stations
- Practice strict entry and exit control



Decontamination Procedures

- Site workers who use the site's SOPs are less likely to be contaminated than site workers who do not use these practices. Workers can take steps to minimize their exposure during decontamination through using contact minimization techniques such as:



- Remote handling techniques which reduce hand-to-material contact such as using shovels/pitchforks, wheelbarrows, bobcats, etc.
- Wear an outer layer of disposable clothing (PPE)
- Encasing tools/equipment in plastic (i.e. place sampling equipment in a plastic bag)
- Spray materials with disinfectant before handling



High Pressure Washers

Associated hazards include:

- Chemical burns
- Lacerations
- Thermal burns
- Contusions
- Back and shoulder strains
- CO production
- Chemical Penetration
- Projectile Production
- Electric shock

Safe use guidelines include:

- Inspection of washer
- Training and proper use
- PPE (including insulating rubber boots)
- Hazcom for cleaning agents
- Use with GFCI and proper electrical safety





Material Handling

- Materials may include infected carcasses, bedding, feed, water, and structures.
- Wear appropriate PPE as outlined in site safety plan.
- Pre-spray carcasses with disinfectant before handling.
- Avoid direct contact with infected materials, use hand tools and mechanized equipment to move infected materials.
- Limit disturbance of infected materials.





Material Disposal

Effective disposal of infected or contaminated materials (e.g., fresh and frozen carcasses, dead birds, eggs, litter, manure, waste products, fittings, and building materials that cannot be effectively decontaminated) is a key part of the AI response. Disposal methods include:

- Composting
- Burial
- Rendering
- Incineration
- Alkaline Hydrolysis Digestion

Information on selecting a disposal method can be found at:

<http://www.aphis.usda.gov/vs/ep/hpai-response.html>



Composting

Carcass composting is a natural biological process.

Phase One:

- Biological activity breaks down carcasses
- The temperature of the compost pile increases and inactivates the AI virus
- Soft tissue decomposes
- Bones partially soften

Phase Two:

- The remaining materials (mainly bones) break down fully
- The compost turns to a consistent dark brown to black soil or “humus” with a musty odor containing primarily non-pathogenic bacteria and plant nutrients



Morrow Composting Pile
Courtesy Dr. W.E. Morgan Morrow



Basic Controls for Composting

- Understand and follow the site health and safety plan.
- Minimize pedestrian and vehicular traffic.
- Understand and follow OSHA's excavation regulations.
- Anticipate and prepare for confined space hazards when vessel composting is used.
- Minimize dust inhalation by using the hierarchy of controls.
- Understand and properly wear approved PPE.



Burial

- There are three burial techniques that may be used:
 - Trench burial
 - Mass burial sites
 - Landfill
- Hazards associated with burial include excavation hazards and heavy equipment issues. Know the hazards of your excavation!
- Environmental contamination may result from disposal so a disposal decision support tool should be used when selecting burial method.



Rendering

- Rendering is the heating of material (carcasses) that simultaneously dries and separates the materials. A fatty substance (such as lard grease) and ground material is produced.
- Rendering can inactivate the AI virus.
- Rendering is a limited option as it increases the AI exposure risk for transportation workers and rendering plant personnel, and the potential to spread the virus to other locations.



Incineration

- There are three broad categories of incineration techniques currently in use:
 - Open-air burning
 - Fixed-facility incineration
 - Air-curtain incineration
- Follow site's fire safety procedures.
- Ensure local Fire Department is aware of any open burning.
- Wear PPE issued by your supervisor including respirator and proximity suit.
- Follow the site's heat stress reduction plan.
- Additional training is required when using fire extinguishers.
- Air-curtains present significant risks, stay back from the edge!





Alkaline Hydrolysis Digestion

- Uses sodium hydroxide or potassium hydroxide to turn carcass material into a sterile aqueous solution.
- PPE and respirators are needed to protect against acids and bases.
- This process requires specialized equipment in a temperature-controlled environment.
- All workers should receive training and understand the associated hazards of running this process.



Depopulation

- In most cases CO₂ or some other asphyxiant, such as foam, will be used to fill a secured bird house.
- A competent health and safety specialist must check atmosphere before you enter the house:
 - Must be less than 5000ppm CO₂, (OSHA PEL) or less than the OSHA PEL for any chemical used
 - O₂ must be greater than 19.5%
- Other forms of euthanasia may be used on smaller flocks (i.e. chemical injection).
- Understand the hazards of the depopulation method used!





General Safety Tips

- Be careful and use safety measures outlined in your worksite's HASP at all times.
- Understand the hazards associated with the climate and season the outbreak occurs in.
- Walking/working surfaces may be wet, slippery and unstable. Spread sand and wear slip resistant footwear if possible, to reduce slips and falls.





General Safety Tips (continued)

- Walking over and handling debris that is unstable can cause cuts, scrapes, bruises, sprains, etc.
- Make sure you have had a current tetanus vaccination.
- Revaccinate for a dirty wound if current vaccination is over 5 years old.
- If you will be performing direct patient care or otherwise expect to have contact with bodily fluids, get the Hepatitis B vaccine series.
- Avoid contact with stagnant water.
 - If exposed to stagnant water, wash and decontaminate yourself and any contaminated equipment immediately
- Use steel toe/shank non-slip footwear if available.
- Use durable outer gloves when handling debris.
- Wear ear protection for noisy environments.



General Safety Tips (continued)



- Personal hygiene – wash hands frequently with soap and water for a minimum of 15 seconds.
- Cover your mouth when you cough by using the crook of your elbow.
- Keep your living quarters clean.
- Only drink provided beverages.



AI Response in Large Cities

- There are many densely populated, urban, live bird markets in the U.S. that may have additional hazards (larger human population to contain if virus mutates to human form, etc.) associated with a densely populated city during an AI response.





Traumatic Stress

- A traumatic event is a shocking and emotionally overwhelming situation in which an individual perceives actual or threatened death or serious injury.
- Workers responding to an HPAI outbreak may experience traumatic stress.
- Reactions to traumatic events will vary, ranging from relatively mild to severe.
- It is very common for people to experience anxiety, terror, shock, and upset, as well as emotional numbness and personal or social disconnection.¹



¹ International Society For Traumatic Stress Studies



Traumatic Stress (continued)

Symptoms and negative effects of Traumatic Stress include:

- Physical illness (headaches, fatigue)
- Unable to function normally on the job
- Depression
- Anxiety
- Making efforts to avoid reminders of a traumatic event
- Marital and family conflict
- Hostility and aggression
- Death through suicide as a reaction to overwhelming stress



How to Cope With Traumatic Stress

Some useful techniques to reduce stress when participating in a response are:

- Take a break from the news
- Pace yourself and take frequent rest breaks
- Watch out for each other
- Be conscious of those around you; responders who are exhausted, feeling stressed, or even temporarily distracted may place themselves and others at risk
- Maintain as normal a schedule as possible
- Drink plenty of fluids such as water and juices

Individuals with prolonged traumatic stress (anxiety, depression, etc.) that disrupt their daily functioning should consult with a trained and experienced mental health professional.



How to Cope With Traumatic Stress (continued)

- Try to eat a variety of foods and increase your intake of complex carbohydrates (breads, muffins made with whole grains).
- Whenever possible, take breaks away from the work area. Eat and drink in the cleanest area possible.
- Recognize and accept what you cannot change-the chain of command, organizational structure, waiting, equipment failures, etc.
- Talk to people when YOU feel like it. You decide when you want to discuss your experience. Talking about an event may be relieving it. Choose your own comfort level.
- If your employer provides you with formal mental health support, use it!
- Give yourself permission to feel rotten: you are in a difficult situation.
- Recurring thoughts, dreams, or flashbacks are normal-do not try to fight them. They will decrease over time.
- Communicate with your loved ones at home as frequently as possible.



How to Cope With Traumatic Stress – What You Can Do at Home

- Reach out, people really do care.
- Reconnect with family, spiritual, and community supports.
- Consider keeping a journal.
- Do not make any big life decisions.
- Make as many daily decisions as possible to give yourself a feeling of control over your life.
- Spend time with others or alone doing things you enjoy to refresh and recharge yourself.
- Be aware that you may feel particularly fearful for your family. This is normal and will pass in time.
- Remember that "getting back to normal" takes time. Gradually work back into your routine. Let others carry more weight for a while at home and at work.



How to Cope With Traumatic Stress – What You Can Do at Home (continued)

- Be aware that recovery is not a straight path but a matter of two steps forward and one back. You will make progress.
- Appreciate a sense of humor in yourself and others. It is okay to laugh again.
- Your family will experience the disaster along with you. You need to support each other. This is a time for patience, understanding, and communication.
- Avoid overuse of drugs or alcohol. You do not need to complicate your situation with a substance abuse problem.
- Get plenty of rest and normal exercise. Eat well balanced, regular meals.



Module 3

Controlling General Hazards Associated with Skilled Support Activities



Electrical Hazards

- Electrocution is a common safety hazard on many work sites.
- Avoid working with electricity in wet environments. If this must be done, use electrical cords approved for wet conditions.
- Electrical cords and plugs must meet OSHA standards.
- Use double insulated tools. Check the Underwriter's Label to be sure the tool is double insulated.
- Use Ground Fault Circuit Interrupters (GFCIs) on all power tools and cords as close to the panel as possible.



Portable GFCI.



Eye Injuries

- AI and other diseases can be transmitted through the eyes.
- Eyes can also be damaged by flying debris or high pressure fluids.
- Fully enclosed goggles should be worn to reduce eye contact with liquid aerosols and other projectiles.
- A face shield must be worn together with safety glasses or goggles.



Chemical Hazards and the HAZCOM Standard

- There are many chemicals used in the control of an AI outbreak.
- Receive specific Hazard Communication training on these chemicals before you use them.
- Understand how to locate, read and apply information in Material Safety Data Sheets (MSDS). MSDS provide both workers and emergency personnel with the proper procedures for handling or working with a particular substance.

See the OSHA HAZCOM Standard, 29 CFR 1910.1200 for more information.



Carbon Monoxide (CO) Exposure

!Carbon Monoxide has no warning properties. It is a colorless odorless gas!

Symptoms: Headache, dizziness, drowsiness, or nausea; progressing to vomiting, loss of consciousness. Prolonged or high exposure can lead to coma or death. You could be at high risk for CO exposure if you are:

- **Using gasoline or propane-powered machinery**
- **Near operating equipment**
- **Near generators**
- **At a fire pit**
- **At a debris reduction site**
- **Burning & compacting**





Animals and Insects

- **Keep scavengers away from infected carcasses and materials.**
- **To protect yourself from mosquitoes:**
 - Use screens on dwellings
 - Wear long pants, socks, and long-sleeved shirts
 - Use insect repellents that contain DEET or Picaridin
- **Beware of wild or stray animals:**
 - Avoid wild or stray animals, call local authorities to handle animals
 - Get rid of dead animals according to local guidelines
 - Wear clean, proper protective clothing when handling carcasses



Animal and Insects (continued)

- **Be on the alert for snakes that may be hiding in unusual places.**
- If you are bitten:
 - Seek immediate medical attention
 - Try to identify the snake so that if it is poisonous, you can be given the correct antivenin
 - Do not cut the wound or attempt to suck the venom out; contact your local emergency department for further care





Blood Borne Hazards

If an accident occurs in the field that exposes coworkers to blood or other human body fluids the OSHA Blood Borne Pathogen Standard* must be followed.

- Use latex or similar gloves when handling human remains.
- Replace gloves if punctured or torn.
- Do not handle human remains if you have skin cuts or punctures.
- Use goggles or face shield and mask for handling human remains, recovering deceased. Make sure to cover your nose and mouth.
- Transport human remains in closed, leak-proof, labeled containers.

* See the OSHA Bloodborne Pathogen Standard, 29 CFR 1910.130 for more information





Confined Spaces

What is a Confined Space?

- Space with limited access
- Large enough for bodily entry
- Not designed for occupancy
- Example: sewers/storm drains



What are the hazards?

- Oxygen deficiency
- Entrapment
- Engulfment
- Hazardous atmosphere



During an AI response you may need to enter confined spaces to clean and disinfect the area



Confined Spaces (continued)

The following must be done before you enter a confined space.

Your supervisor must:

- Make sure you and the attendant are trained
- Ventilate and monitor for hazardous atmosphere
- Lock out or tag out all power equipment in the space
- Issue appropriate PPE, possibly including self-contained breathing apparatus (SCBA)
- Establish barriers to external traffic such as vehicles and pedestrians
- Provide ladders or similar equipment for safe entry and exit in the space
- Provide good communications equipment and alarm systems
- Have rescue equipment and trained rescue personnel nearby



Your Safety Officer Must Approve Confined Space Entry!!!!



Driving and Traffic Issues

- Worksites must be posted with legible traffic signs at points of hazard. Flag persons or Flaggers are used when signs, signals, and barricades do not provide adequate protection for workers. Traffic issues workers may experience include:
 - Heavy traffic
 - Inexperienced or poor drivers
 - Movement of overloaded or unusual vehicles, oversized loads, and heavy operating equipment





Excavation Hazards

- Burial of infected and contaminated material may be used as a disposal method.
- An excavation is any man-made cut, hole, trench, or depression in the earth formed by earth removal. A trench is defined as a narrow underground excavation that is deeper than it is wide, and is no wider than 15 feet.
- The following are potential excavation hazards:
 - Cave in
 - Falls; falling loads
 - Hazardous atmosphere
 - Incidents involving mobile equipment
- A competent person must evaluate soil for excavation safety. All excavations/trenches should have safe means for entering and exiting (ladders, safe design, etc.). **DO NOT enter an unsafe excavation!**



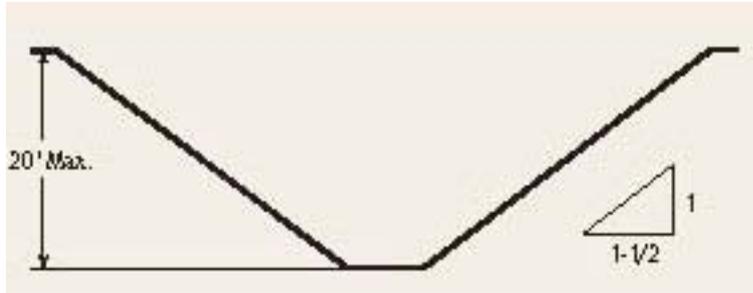
Excavation Hazards¹ (continued)

- A trained worker must evaluate soil for excavation safety.
- If an excavation is over 4 feet deep, an egress (emergency exit route/device i.e. ladder) must be provided which may not be the sides of the excavation.
- Distance to egress must be 25 feet or less.
- If an excavation is five feet or more, one of the following engineering controls must be used:
 - Shoring
 - Shielding
 - Sloping

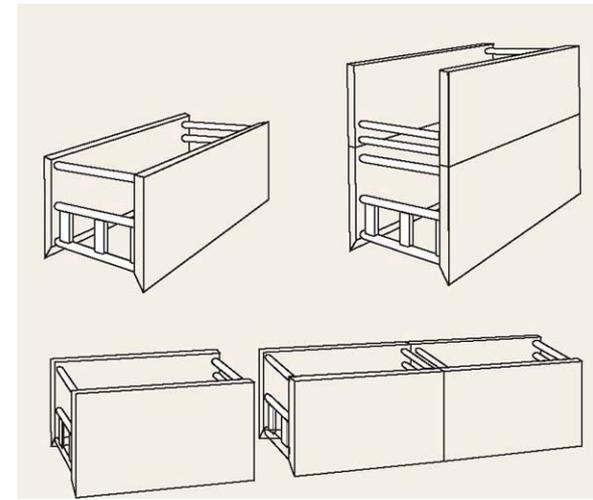
¹ OSHA Trenching and Excavation Factsheet



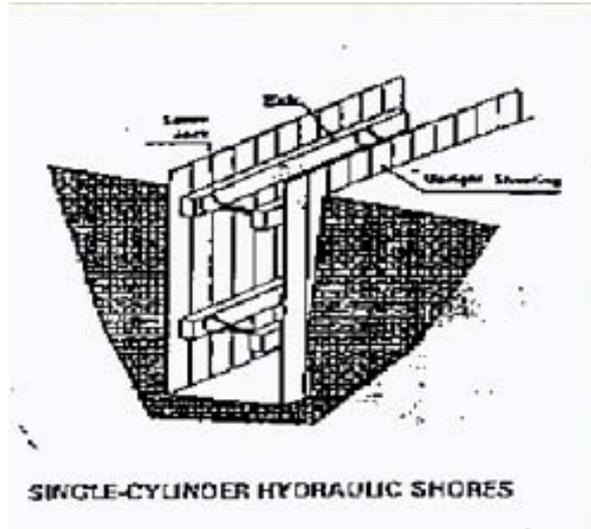
Controlling Excavation Hazards



Sloping in type C soil



Shielding



Shoring



Excavation Hazards (continued)

General Trenching and Excavation Rules:

- Keep heavy equipment away from trench edges
- Keep surcharge loads at least 2 feet (0.6 meters) from trench edges
- Know where underground utilities are located
- Test for low oxygen, hazardous fumes and toxic gases
- Inspect trenches at the start of each shift
- Inspect trenches following a rainstorm
- Do not work under raised loads

See OSHA Trenching and Excavation Factsheet for more information



Hand and Portable Power Tools

All workers should be trained on the tools they use.

Hand Tools

- Inspect your tools in accordance with manufacturers specifications.
- Take damaged tools out of service.
- Use only sharp tools.



Portable Power Tools

- Inspect your tools in accordance with manufacturers specifications.
- Use with sharp blades.
- Use with GFCI.
- Use with proper gauge electric cord.
- Use double insulated tools.
- Always wear eye protection.



Ergonomics

Ergonomics is the arranging of the work environment and task methods to reduce injury and fatigue in workers. An example is using roller conveyors on which objects can slide to eliminate unnecessary lifting. Ergonomics can assess the following risk factors:

- Use of force
- Repetition
- Awkward posture
- Pushing, pulling, lifting
- Lack of rest
- Heat/cold
- Vibration
- Stress

An AI response may have a heavy lifting demand and repetitive motions within a short time period. An AI response may have many of the ergonomic risk factors.

See OSHA at www.osha.gov for more information on controlling ergonomic hazards.



Heavy Equipment Use

- OSHA requires machinery to be inspected by a qualified worker before each use.
- Be alert to the activities around you.
- Do not exceed the load capacity of lifting equipment.
- Do not walk under or through areas where heavy equipment are lifting objects.
- Do not climb onto or ride loads being lifted or moved. Do not ride on equipment or in bucket.





Heavy Equipment Use (continued)

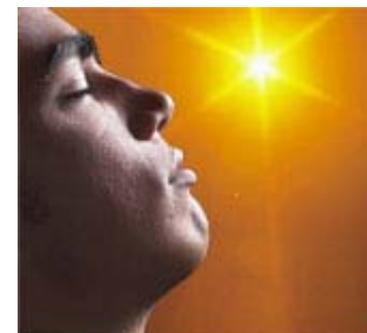
The following are the types of heavy equipment that may be used during an Avian Influenza response:

- Front End Loaders
- Forklifts
- Bobcats
- Tractors
- ATV's
- Trailers





Heat Stress



Common signs and symptoms workers experience if they have any of these conditions.

<u>Heat Stress</u>	<u>Heat Exhaustion</u>	<u>Heat Stroke</u>
<ul style="list-style-type: none">• Headache• Thirst• Profuse sweating• Muscle aches	<ul style="list-style-type: none">• Headache• Dizziness• Confusion• Nausea• Sweating-pale, clammy skin• Cramps, legs & abdomen• Rapid, weakening pulse & breathing	<ul style="list-style-type: none">• Headache• Dizziness• Restlessness• Confusion• Hot, flushed dry skin• Body temp above 104°F• Unresponsive/disoriented



Heat Stress (continued)

- Drink when thirsty. Drink sports drinks, instead of water, if you can to replenish electrolytes and prevent cramping.
- Know the signs of heat-related illnesses.
- Monitor yourself and coworkers, use the buddy-system.
- Block out direct sun or other heat sources.
- Use cooling fans/air-conditioning and rest regularly.
- Wear lightweight, light-colored, loose-fitting clothes and a hat if available. Avoid alcohol, caffeinated drinks, or heavy meals.
- Get medical help for symptoms such as altered vital signs, confusion, profuse sweating, excessive fatigue, or rapid heartbeat.
- Take shelter in shaded areas. Fire fighters should unbutton and remove bunker gear.



Cold Stress

- Exposure to cold can reduce work efficiency and increase possibility of accidents.
- When working in cold climates wear additional layers under protective equipment for warmth.
- If you are cold for extended periods (10 minutes or more) seek a warm area for a break and change your clothes to stay warm before returning to work.¹
- Use the buddy system - work in pairs so that one worker can recognize danger signs.¹
- Drink warm, sweet beverages (sugar water, sports-type drinks) and avoid drinks with caffeine (coffee, tea, sodas or hot chocolate) and alcohol.¹
- Eat warm, high-calorie foods such as hot pasta dishes.¹

¹ www.OSHA.Gov



Sunburn, Wind Burn and Solar Glare

- Do not overexposure your skin and eyes to sunlight, cold or wind.
- Sunburn reduces responder readiness and increases your risk for skin cancer.
- Use sunscreen and lip balm.
- Use protective eyewear.
- Wear clothing that covers your skin (long sleeves and pants). Wear a hat.
- Limit your exposure.



Noise Exposure

- Wear appropriate hearing protection in noisy work environments.
 - Examples: power saws, earth-moving equipment, pneumatic tools.
- A worksite is considered noisy if you have to shout to be heard within normal talking distances (i.e. three feet).



Ear muffs



AI Response Activity

Use a final activity that will include all students in the course if time permits (4 hour or longer course). It should allow previously covered topics to be combined and “put to the test” in an actual AI scenario.

The Council of State and Territorial Epidemiologists’ (CSTE) Avian Influenza web page provides training modules for the public health community to prepare for their role in a multi-agency response to avian influenza. The last module in the course contains an in-depth group activity/case study. The activity should be reworked to fit your audience, time frame, geographic location and level of training. You can access these modules at:

<http://www.cste.org/Influenza/avian.asp>



Summary

- The hazards and issues covered in this training tool are dynamic and require vigilance and flexibility.
- The key to a safe response is attention to the safety issues of your work environment.
- In addition to the similar physical hazards of a construction or demolition site, there is the added factor of a disease agent and the chemicals associated with its control.



Information Sources

This training tool is based on recommendations from:

- U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Services (APHIS)
- National Institute of Environmental Health Sciences (NIEHS)
- National Institute for Occupational Safety and Health (NIOSH)
- Occupational Safety and Health Administration (OSHA)
- Centers for Disease Control and Prevention (CDC)
- Environmental Protection Agency (EPA)
- World Health Organization (WHO)

Factsheets from these agencies and other avian and pandemic influenza preparedness resources are available on the NIEHS National Clearinghouse for Worker Safety and Health Training Website, www.tools.niehs.nih.gov/wetp.



Why This Training Tool Was Created

This training tool was created by the NIEHS National Clearinghouse for Worker Safety and Health Training under a contract (273-05-C-0017) from the National Institute of Environmental Health Sciences Worker Education and Training Program (WETP). WETP has trained over a million emergency responders and hazardous waste workers since 1987 to do their jobs safely. WETP is a part of the Department of Health and Human Services, which is a cooperating agency under the Worker Safety and Health Support Annex of the National Response Plan. As part of the coordinated effort, the National Clearinghouse worked with NIEHS, WETP in partnership with USDA-APHIS to create this orientation briefing for those who may be exposed to Avian Influenza.