Occupational Health Challenges in Agriculture – Chronic & Emerging Issues

Michigan Occupational & Environmental Medicine Association
September 28, 2018

Charlotte Halverson, BSN, COHN-S
AgriSafe Network
Focus Areas

At the conclusion of this presentation, you will be able to:

1. Recognize sources and symptoms of three chronic/ongoing occupational health challenges for agricultural workers
2. Identify two sources of emerging healthcare concerns in production agriculture
3. Locate resources relative to agricultural occupational healthcare and patient education
Who We Are ...

- The AgriSafe Network, a non-profit national membership organization, represents health professionals and educators who strive to reduce health disparities found among the agricultural community.

- The AgriSafe Network is dedicated to supporting rural health professionals who serve the healthcare needs of farmers and ranchers.
Meet the AgriSafe team

Linda Emanuel
Community Health Nurse

Natalie Roy
Executive Director

Stacey Jenkins
Distance Education Coordinator

Knesha Rose-Davison
Health Communications Director

Charlotte Halverson
Clinical Director
What We Do...

- Provide educational and informational programs - *onsite, webinar, on-demand*
- Develop and disseminate resources specific to agricultural health and safety issues
- Guide personal protective selection for agricultural workers
- Host the AgriSafe Network membership
- Consult with healthcare professionals in rural and agricultural communities.
TOTAL FARMER HEALTH

A TWH Affiliate!
Welcome to the AgriSafe Network

AgriSafe was formed in 2003 by rural nurses who believed that together they could improve the health and safety of farmers and ranchers. Today, AgriSafe builds the competency of health and safety professionals to deliver exceptional occupational agricultural health care.

Respiratory Health and Grain Safety

Free training options available! Learn more here.

Let's keep in touch!
Sign up to get AgriSafe's newsletter and announcements sent directly to your inbox.

Member Locator Map

Visit us at www.agrisafe.org
What We Know....

- Over 95% of U.S. farms are operated by families, family partnerships, or family corporations
- Agriculture production is rapidly changing
- Spectrum of risks - machinery, livestock, weather, chemicals, stress, infectious diseases
- Lack of health care access
- Farmers and ranchers frequently are part of medically underserved populations
Continuum of Life
Agricultural Health and Safety Impact
What We See...

- Multi generational family farms
- Broad age continuum in agriculture
- Multiple respiratory exposures
- Noise exposures consistently exceeding 85dB
- Zoonotic illnesses
- Mental health challenges
- Musculoskeletal injuries - acute and chronic; contributing to the opioid crisis in rural America
- Women’s health issues
- Mobile workforce
Safety Considerations - What Can We Do?

Engineer dangers out of environment if at all possible!

- Eliminate working conditions that threaten safety, health, and well-being
- Substitute health-enhancing policies, programs, and practices
- Redesign the work environment for safety, health, and well-being
- Educate for safety and health
- Encourage personal change

Personal protective equipment may be only feasible solution - The last line of defense!

Respiratory Issues in Agriculture
Types of Respiratory Exposures

- Confined Animal Feeding Operations (CAFOS)
- Pesticides
- Grain Handling (many types of grains)
- Cotton / Tobacco
- Anhydrous Ammonia
- Welding
- Using gas or diesel engine indoors
- Fumigation
- Silo Entry
- Paint (spraying)
- Woodworking
Hazardous Substances

Many substances pose a hazard to the respiratory system in the agricultural setting, especially in enclosed settings:

- Organic dusts
- Inorganic dusts
- Mists
- Molds
- Vapors
- Toxic fumes and gases
- Oxygen deficient environment
Bronchioles and Alveoli

- The size of particles is directly linked to their potential for causing health problems.
- 30 µm (microns) lands in nasopharyngeal area.
- 10 µm stops in the trachea, bronchi, and bronchioles.
- Small particles less than 10 µm (microns) in diameter pose the greatest problems, because they can get deep into your lungs, and some may even get into your bloodstream.
Particle Size

- PM 2.5: Combustion particles, organic compounds, metals, etc. < 2.5 μm (microns) in diameter
- PM 10: Dust, pollen, mold, etc. < 10 μm (microns) in diameter

Particle Size:
- HUMAN HAIR: 50-70 μm (microns) in diameter
- FINE BEACH SAND: 90 μm (microns) in diameter

Image courtesy of the U.S. EPA
Characteristics to Assess

Exposure Characteristics
- Concentration of contaminant
- Content of contaminant
- Length of exposure

Individual Characteristics
- Age
- Body build
- Medical history
- Social history
- Family history
Exposure Classifications

- **CLLC**: Chronic Exposure to Lower Level Concentrations
  - Confinement buildings
  - Feeding animals
  - Grain elevators
  - Feed mills

- **PAMM**: Periodic Acute Massive & Moldy - exposure to high concentrations
  - Loading turkeys, chickens, pigs
  - Power washing
  - Cleaning moldy grain / emptying grain bins
Airborne Dust
Outdoor Livestock + Feeding & Bedding

- Cattle
- Sheep
- Goats
- Poultry

Hazards: Organic dust exposure from feeding grain and storage of hay and bedding.
Grain Dust

- Hazard is organic dust (feed or grain dust, molds and spores).
- Can cause Toxic Dust Organic Syndrome or Farmer’s Lung.
- Corn, soybeans, hay, peanuts, wheat, cotton, other.
General Symptoms

- Headache
- Dizziness
- Runny or sore eyes
- Sore throat
- Stuffy nose or sneezing
- Cough
- Wheezing or tightness in chest
- Shortness of breath
- Nausea or vomiting
- Monday morning syndrome
Specific Symptoms

**Toxic Dust Organic Syndrome**
- Symptoms occur 4 to 6 hours after exposure
  - Dry irritated cough
  - Fever
  - Muscle aches
  - Shortness of breath

**Hypersensitivity Pneumonitis**
- Fever – occurs 4 to 6 hours after the exposure... along with other symptoms
  - Shortness of breath
  - Cough w/ sputum
  - Chest tightness
  - Can be allergic reaction
  - May get worse with each exposure!
Occupational Asthma

Normal bronchial tube

- Relaxed smooth muscles
- Alveoli

Inflamed bronchial tube of an asthmatic

- Tightened smooth muscles
- Swelling
- Mucus
Gas Exposures in Agriculture

Manure gas consists of four major (and multiple minor) gases:

- Ammonia
- Methane of high significance
- Carbon dioxide
- Hydrogen sulfide

Also

- Carbon monoxide
- Silo gas - nitrogen dioxide
Silo Filler’s Disease - exposure to very high concentrations of nitrogen dioxide and carbon dioxide. Nitrogen dioxide (NO2) found in higher than normal concentrations within farm silos is the predominant toxin in silo filler’s disease.
Other Exposures

- Pesticides
- Welding
- Gas/Diesel indoors - *Carbon monoxide!*
- Woodworking
- Painting
OSHA’s Respiratory Protection Standard
29 CFR 1910.134

This standard applies to

- General Industry (Part 1910),
- Shipyards (Part 1915),
- Marine Terminals (Part 1917),
- Longshoring (Part 1918), and
- Construction (Part 1926).

- There is no Respiratory Standard specific to Agriculture
- Rely on General Industry Standard or General Duty Clause

www.osha.gov
Appropriate Respiratory Protection

Choosing the right protection means

- Right mask for the job
- The right fit for the mask
- Have masks available
- Multiple types of protection may be needed
- Choices can be expensive
- Compliance is an issue

Best Management Practice!
Grain Dust

Respirator recommendation:

- Hazard is organic dust (feed or grain dust, molds and spores).
- Can cause Toxic Dust Organic Syndrome or Farmer’s Lung.
- Corn, soybeans, hay, peanuts, wheat, other.

Half face respirator

N 95 filtering face piece (mask) (respirator)

Pictured - 3M 8511
Hay

Can be organic dust

- Hazard can be organic dust (molds and spores).
- Can cause Toxic Dust Organic Syndrome or Farmer’s Lung.

Protection: Filtering face pieces.

N 95 filtering face piece (mask) (respirator)  HEPA P100
Hog or Poultry Confinement

Respirator Recommendation

- **Organic Dust** = Filtering face piece, disposable 2 strap mask or half mask with dust cartridge or HEPA filter
  
  *Examples: 3M 8210, 8511, 8271, 3M 8233*  
  *Moldex 2200 or 2300*

- **Ammonia** = Filtering face piece or if symptomatic or dislike ammonia smell use half or full face mask with ammonia cartridge and prefILTER
Welding

Hazard is metal fumes.

- Particulates

Respirator selection:

- Air purifying respirator which is N100, R100, or P100.
- Filtering face Piece, half mask face piece or full face piece.
- Wear under hood

3M 8233

3M 8214
Pesticides

- Hazard is organic vapors and aerosols (solid and sprayed liquids).

- Respirator selection:
  - Solids - filtering face piece N,R, or P series.
  - Liquids - Half mask face piece with Organic Vapor cartridge and P pre-filter.
  - Can also use full face piece or powered air purifying respirator.

**NOTE:** Read Label or SDS (formerly MSDS) which provides information on respirator selection.
Cholinesterase Protocol for Healthcare Providers

- Whom to Test?
- Testing
- Post Exposure Testing
- Medical Removal
- Level of Return to Handling
- Review of Handling Practices

<table>
<thead>
<tr>
<th>Cholinesterase Testing Protocols for Healthcare Providers</th>
</tr>
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<tbody>
<tr>
<td><strong>Whom to Test?</strong></td>
</tr>
<tr>
<td>Cholinesterase is an enzyme system that helps break down certain nerve chemicals in the body. It is critical for normal nerve function. When exposed to nerve agents, healthcare providers should be tested to ensure they are not exposed to harmful levels.</td>
</tr>
</tbody>
</table>

| **Testing** |
| When to test includes:
- Pre-employment testing
- Post-employment testing
- Mandatory testing
- Optional testing

| **Post Exposure Testing** |
| When to test includes:
- Exposure within the past 48 hours
- Exposure within the past 24 hours

| **Medical Removal** |
| Criteria for removal includes:
- Exposure to nerve agents
- Presence of symptoms

| **Level of Return to Handling** |
| Levels of return include:
- Level 1
- Level 2
- Level 3

| **Review of Handling Practices** |
| Activities include:
- Review of handling practices
- Training in proper handling techniques

Archived Webinar

**Post Exposure Testing**

For healthcare providers, post-exposure testing is critical to ensure the safety of patients and colleagues. It is recommended to perform testing within 24-48 hours after exposure to nerve agents.

**Medical Removal**

Criteria for medical removal are based on the extent of exposure, including the type of nerve agent and the level of exposure. Medical removal may be necessary to protect patients and colleagues.

**Level of Return to Handling**

Levels of return to handling activities are based on the type of nerve agent and the level of exposure. Healthcare providers may return to handling duties after a specific period of time, depending on the level of exposure.

**Review of Handling Practices**

Activities include reviewing handling practices, training in proper handling techniques, and ensuring the safety of patients and colleagues.
Cholinesterase Algorithm

Worker will handle OPs or OPs and N-methylcarbamates for 30 hours or more in 30 consecutive days?

NO

STOP

YES

Exposure within the past 30 days?

NO

Obtain at least one baseline

YES

Working Baseline - obtain 2 tests that are > 3 days apart. Use higher value.

NO Testing Required

Return to handling ChE-inhibitors

YES

Test >80% baseline?

NO

Repeat testing at scheduled intervals to follow recuperation

YES

Remove from workplace exposure

NO

ACHE less than 70% or PChE less than 80% of baseline?

YES

Review pesticide handling practices

NO

Within 1 week conduct follow up monitoring test

YES

RBC or plasma ChE less than 80% of baseline?

NO

Return to handling ChE-inhibitors

YES

Within 1 week conduct follow up monitoring test
Which Respirator is Right for the Farm Work You Do?

Do you have any respiratory exposures?
Examples: hogs, cattle dairy, poultry, grain, tobacco, cotton, pesticides, chemicals, silos and welding

Consider Your Exposures
Most farm activities put you at risk for some type of respiratory exposure causing a need for respiratory protection.

Are you exposed to dust/aerosols?
- Grain
- Hay
- Hogs
- Pesticides (solid)
- Poultry
- Mold
- Grain Dust

Use one of the following:
- Two Strap Respirator
- Canister with P100 Filters
- Powered Air Purifying Respirator (PAPR)

Are you exposed to chemicals/fumes?
- Pesticides or Paint (organic vapors)
- Ammonia, Disinfectants
- Bleach (chlorine gas)

Use one of the following:
- Half Mask Canister Respirator
- Powered Air Purifying Respirator (PAPR)

Do you work in an oxygen limiting environment?
- Livestock and Poultry Confinement
- Grain Handling, Fumigation
- Manure Pits, Hydrogen Sulfide, Silo

Use one of the following:
- Self Contained Breathing Apparatus (SCBA)
- Supplied Air Respirators

*An oxygen limiting environment would be considered a confined space where there would not be enough oxygen to support life.

Recommendations and Resources
Fit Testing - choosing the right respirator with the right fit is essential to having adequate protection. Canister respirators should be fit tested and fit checked with each use. To find out more information about proper fit contact AgriSafe Network www.agrisafe.org

If you have a medical condition that would prohibit you from wearing a respirator consult a health care provider.
Example: heart conditions, lung conditions such as asthma or emphysema, uncontrolled hypertension or claustrophobia

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Occupational History Questions To Be Directed to the Worker

1. What are your current agricultural respiratory exposures? (example: hogs, cattle, dairy, poultry, grain, chemicals, silos, and welding)

2. Are any of these situations considered a confinement operation?

3. Do you use a power washer to disinfect buildings?

4. How much time in a day do you spend in this environment?

5. Do you apply your own chemicals? If so, what type of chemicals do you apply and how often? (example: insecticides, herbicides, fumigants)

6. Do you ever enter an environment that would be considered a confined space where there would not be enough oxygen to support life? (Example: hog confinement during or immediately after pumping out manure, poorly vented areas with exposures from fumigants, power washers, space heaters or situations such as reentry following manure pit pump out or agitation, silo entry prior to three weeks after filling)

7. Do you have hobbies other than farming that would cause a respiratory exposure? (examples: wood working or auto body painting)

8. Have you worn a mask before and if so, what type? Examples would be as follows:
   - 1 strap or 2 strap filtering face piece
   - half mask canister
   - full face piece canister
   - powered air purifier such as the Air Stream Helmet
   - or a SCBA (self contained breathing apparatus)

9. Did you have any difficulty wearing this mask?

10. Have you had a respirator fit test in the past?

11. Do you have any known medical conditions that would prohibit you from wearing a mask? (Example: heart conditions, lung conditions such as asthma or emphysema, uncontrolled hypertension, or claustrophobia)
Hearing Conservation Challenges
Challenges

➢ Longer work days + shorter recovery time and an increase in cumulative noise exposure

➢ Hearing protection needs are not consistent - multiple types of exposures in any day

➢ Access to appropriate hearing protection - where to find it / where to store it

➢ Finding hearing protection that works
Hearing Loss : A Real Concern

• 1 in 10 Americans has a hearing loss that affects his/her ability to understand normal speech

• NIHL is one of 21 priority areas for NIOSH research  http://www.cdc.gov/niosh/topics/noise/

• NIHL has been listed as one of the most prevalent occupational health concerns in the U.S. for over 25 years. www.osha.gov/SLTC/

• 30 million people are exposed to hazardous noise levels at work – agricultural workers have the second highest prevalence of NIHL

Multiple organ systems impact - noise stimulates the “fight/flight” mechanism response -
- causes elevated gluco-corticosteroids and sleep disturbances
- can cause increases in blood pressure, heart rate, and cardiac output
- occur not only at high sound levels in occupational settings but also at relatively low environmental noise levels

Marjorie McCullagh, PhD, RN, PHNA-BC, COHN-S, FAAOHN, FAAN      University of Michigan
Cochlear Damage

Healthy Cochlea

Damaged Cochlea
Common Noise Levels

Exposure to noise above 85 dB can cause hearing loss and tinnitus.

A "decibel" is the unit used to measure the loudness of sound. Decibel levels for each item shown in the graph may vary.
Harmful Farm Noises

- Continuous noise:
  - Equipment noise - combines, tractors, grain dryers
  - Animal noise - hogs

- Impact noise:
  - Shop noise
  - Striking / pounding
  - Gun shot

Impact noise is the most harmful - studies show that farmers spend more time overall in their shop areas than on equipment
Proper Insertion – takes practice
No one hearing protective device works for everyone

Wearing muffs over plugs only adds 5 – 10 dB more protection (may be recommended if exposures is 105 dB 8 hr (TWA)
Zoonotic Diseases Common to Agriculture
Zoonotic Disease

- Majority of emerging infectious diseases in U.S. are zoonotic – over 75% of emerging pathogens are considered zoonotic (i.e.: cat scratch & leptospirosis)  
  [www.cdc.gov/onehealth](http://www.cdc.gov/onehealth) October 2013

- About 25 zoonotic infectious diseases are considered to be a significant occupational hazard to agricultural workers in western industrialized countries.


- Difficult to determine numbers as many are unreported
  - Symptoms are not severe or individual may not realize a disease is reportable (notifiable)
  - *Not uncommon in agriculture!*
Economic Concerns
- a HUGE Issue!

- Costs related to loss of diseased livestock
- Costs related to herd replacement
- Cost of disease prevention and treatment of infections - money & time involved
- Production costs impacted by operator/worker illness
Health Care Providers Need to Ask:

1. What is your occupation?
   - Do you work with animals?
   - Do you have pets?
   - Have you been exposed to any animals or birds with known or suspected diseases? When?

   **Incubation periods vary !!**

   - Have you traveled to a different part of the country or out of the country recently?

2. Do you have any of the following symptoms?
   - Fever – short time or intermittent
   - Headache
   - Chills
   - Fatigue
   - Joint pain or swelling
   - Redness over joints
   - Rashes or hives
   - Menstrual cycle changes or a recent spontaneous abortion/miscarriage
   - Orchyitis
   - Diarrhea
   - Darkened or blood tinged urine
   - Nausea
   - Vomiting
<table>
<thead>
<tr>
<th>Disease</th>
<th>Host/Carrier</th>
<th>Characteristics &amp; Primary Transmission</th>
<th>Incubation</th>
<th>Human Symptoms</th>
<th>Precautions/Care/Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brucellosis</td>
<td>cattle, swine, sheep, goats</td>
<td>• contact with animal tissue, blood, fluids&lt;br&gt;• inhalation</td>
<td>1 - 15 weeks</td>
<td>• fever&lt;br&gt;• malaise&lt;br&gt;• flu-like symptoms&lt;br&gt;• can affect heart, bone &amp; other organs</td>
<td>• rest&lt;br&gt;• fluids&lt;br&gt;• ppe&lt;br&gt;• antibiotics</td>
</tr>
<tr>
<td>Leptospirosis in Humans: Weil's Disease</td>
<td>cattle, swine, sheep, goats, wildlife</td>
<td>• contact with urine of infected animals</td>
<td>7 - 12 days</td>
<td>• fever&lt;br&gt;• malaise&lt;br&gt;• flu-like symptoms&lt;br&gt;• jaundice</td>
<td>• rest&lt;br&gt;• fluids&lt;br&gt;• ppe&lt;br&gt;• antibiotics</td>
</tr>
<tr>
<td>Erysipelas</td>
<td>swine, chickens, turkeys</td>
<td>• contact with animal tissue or waste&lt;br&gt;• contact with infected soil&lt;br&gt;• ingestion</td>
<td>3 - 14 days</td>
<td>• fever&lt;br&gt;• chills&lt;br&gt;• headache&lt;br&gt;• joint pain&lt;br&gt;• skin lesions</td>
<td>• rest&lt;br&gt;• fluids&lt;br&gt;• ppe&lt;br&gt;• antibiotics&lt;br&gt;• treat cuts and abrasions immediately</td>
</tr>
<tr>
<td>Campylobacter</td>
<td>cattle, swine, sheep</td>
<td>• under cooked meat&lt;br&gt;• raw milk&lt;br&gt;• contaminated water</td>
<td>2 - 4 days</td>
<td>• abdominal pain&lt;br&gt;• diarrhea&lt;br&gt;• fever</td>
<td>• rest&lt;br&gt;• fluids&lt;br&gt;• ppe&lt;br&gt;• antibiotics&lt;br&gt;• food prep - precautions</td>
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<tr>
<td>Lyme Disease</td>
<td>diseased deer or rodents</td>
<td>• infected ticks</td>
<td>3 days – several weeks</td>
<td>• “bulls eye” reddened area • fever • fatigue • joint pain • swelling</td>
<td>• ppe • anti-inflammatory • antibiotics • rest • fluids</td>
</tr>
<tr>
<td>E Coli</td>
<td>all livestock</td>
<td>• direct or indirect contact with animal waste</td>
<td>3 – 4 days can be 1 – 10 days</td>
<td>• diarrhea • cramps • vomiting</td>
<td>• fluids • electrolytes • rest • ppe *see physician if symptoms last more than a few days</td>
</tr>
<tr>
<td>Tetanus</td>
<td>horses sheep</td>
<td>• soil contaminated with spores</td>
<td>3 – 21 days (average is 10 days)</td>
<td>• muscle spasms • skeletal contractures • seizures • respiratory distress</td>
<td>• ppe • immediate care • anti-toxins</td>
</tr>
<tr>
<td>Anthrax</td>
<td>cattle sheep horses swine goats dogs</td>
<td>• animal carcasses • inhaled spores • water</td>
<td>1 – 12 days 1 – 7 days (respiratory)</td>
<td>• skin lesions • itching • bumps • redness • respiratory distress in severe cases</td>
<td>• antibiotics • ppe • immediate care of skin abrasions</td>
</tr>
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# Bacterial Zoonotic Diseases

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</tr>
</thead>
</table>
| Tularemia                    | sheep, rabbits, skunks | - sheep  
- ticks  
- mosquito  
- water  
- inhalation                                      | 1 - 10 days | - fever  
- chills  
- headache  
- lymph node swelling  
- ulceration                           | - ppe  
- food prep precautions  
- antibiotics |
| Q Fever                      | cattle, goats, sheep | - inhalation of contaminated dust (dried placenta/birth fluids)  
- tick bites  
- raw milk                              | 3 - 30 days | - high fever  
- chills  
- sweating  
- headache  
- 30% - 50% develop pneumonia               | - fluids  
- rest  
- ppe  
- antibiotics  
- pain meds |
| Salmonella                   | dairy animals, sheep, poultry | - inhalation  
- infected soil  
- water  
- raw milk  
- under cooked food            | 12 - 72 hours | - fever  
- diarrhea  
- cramps  
- vomiting                        | - rest  
- fluids  
- antibiotics  
- ppe |
| Psittacosis (Parrot Fever) (Ornithosis) | wild birds, poultry | - infected tissue  
- animal/bird feces  
- inhalation of secretions            | 5 - 19 days | - fever  
- headache  
- dry cough  
- pneumonia-like symptoms              | - rest  
- fluids  
- antibiotics  
- ppe |
Lyme Disease

Length of incubation period makes exposure history crucial!!

“Classic” erythema migrans rash  Facial palsy  Swollen knee
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</thead>
<tbody>
<tr>
<td><strong>Rabies</strong></td>
<td>mammals bats wild animals pets</td>
<td>• animal bites • contact with infected tissue</td>
<td>2 – 21 days (usually 5 – 12) may be up to 3 months</td>
<td>• headache - malaise • fever • salivation • difficulty swallowing • seizures</td>
<td>• PPE • immune globulin • vaccine</td>
</tr>
<tr>
<td><strong>Hanta Virus</strong></td>
<td>infected rodents</td>
<td>• inhalation of rodent feces or urine</td>
<td>7 – 39 days</td>
<td>• fever • dizziness • nausea - vomiting • pulmonary edema</td>
<td>• PPE • intense medical treatment and support of cardiac and pulmonary symptoms</td>
</tr>
<tr>
<td><strong>Encephalitis</strong></td>
<td>various animals mosquitoes ticks rodents</td>
<td>• bites</td>
<td>4 – 14 days</td>
<td>• headache • flu-like symptoms • restless • agitation</td>
<td>• PPE • anti-inflammatories • antivirals • steroids • rest</td>
</tr>
<tr>
<td><strong>Hepatitis E</strong></td>
<td>hepatitis E swine</td>
<td>• consumption of fecally contaminated drinking water • from infected animals • consumption of uncooked/under cooked pork or deer meat</td>
<td>3 – 6 weeks</td>
<td>• fever • anorexia • nausea • abdominal pain • jaundice</td>
<td>• PPE • treat symptoms • immunoglobulin • vaccine</td>
</tr>
<tr>
<td><strong>Newcastle Disease</strong></td>
<td>poultry</td>
<td>• contact with secretions of infected birds</td>
<td>2 – 15 days</td>
<td>• conjunctivitis • rarely flu-like symptoms</td>
<td>• PPE • eye drops • avoid sunlight</td>
</tr>
<tr>
<td><strong>Poxvirus</strong></td>
<td>dairy cows cattle</td>
<td>• direct animal contact - teats or muzzle</td>
<td>5 – 14 days</td>
<td>• reddened • nodules • wart like nodules • swelling around affected area</td>
<td>• PPE • keep area dry • topical antiviral ointments</td>
</tr>
<tr>
<td><strong>Animal Influenza</strong></td>
<td>Avian (bird) flu H5N1, H7N9 &amp; H9N2 Swine H1N1 &amp; H3N2</td>
<td>• direct or indirect exposure to infected live or dead animals or contaminated environments</td>
<td>Avian: 2 – 8 days Swine: 1 – 7 days</td>
<td>• fever • cough - sore throat • chest pain • abdominal pain - diarrhea • vomiting • bleeding from nose or gums</td>
<td>• rest • fluids • prescribed antiviral drugs in some instances</td>
</tr>
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Avian Influenza Guidelines
### Fungal Zoonoses

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<td>Ring Worm</td>
<td>Infected farm animals, pets</td>
<td>Contact with animals, contact with feed or secretion</td>
<td>10 - 14 days</td>
<td>Itchy, red, raised patches on skin, may have pustules, may be ring shaped, hair loss</td>
<td>Keep skin dry, antifungals, protective clothing, <strong>scratching may cause a secondary bacterial infection</strong></td>
</tr>
<tr>
<td>Histoplasmosis</td>
<td>Bats, birds</td>
<td>Inhalation of fungal spores from droppings</td>
<td>3 - 17 days</td>
<td>Fever, chills, fatigue, muscle aches, headache, chest pain</td>
<td>PPE, rest, fluids, pain relievers, anti fungal, <strong>treatment may last 3 months to one year</strong></td>
</tr>
</tbody>
</table>

### Parasitic and Protein Particle Zoonoses

<table>
<thead>
<tr>
<th>Disease</th>
<th>Host/CARRIER</th>
<th>Characteristics &amp; Primary Transmission</th>
<th>Incubation</th>
<th>Human Symptoms</th>
<th>Precaution/Care / Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tape Worm &amp; Trichinosis - Parasites</td>
<td>Pigs, Cattle</td>
<td>Ingestion of infected, undercooked meats</td>
<td>1 - 2 days for acute phase, 2 - 8 weeks for chronic phase</td>
<td>Abdominal discomfort, fever &amp; flu symptoms with trichinosis</td>
<td>PPE, antiparasitic drugs for tape worm, usually no meds for trichinosis, <em>may require antiparasitics</em></td>
</tr>
<tr>
<td>Amoebic Dysentery - a Protozoa Parasite</td>
<td>Dogs</td>
<td>Ingesting contaminated food, water</td>
<td>2 days - several months</td>
<td>Vomiting, acute or diarrhea</td>
<td>PPE, antimicrobial drugs, antibiotics if bacterial infection develops</td>
</tr>
</tbody>
</table>
Ringworm

Ringworm on the back  Ringworm on the arm  Ringworm on the scalp
Needlestick Injuries

- There are a variety of biologics, vaccines, antibiotics, and hormones used in animal agriculture. ¹
- Needlestick injury (NSI) prevention, research, and education for veterinarians and agriculture workers is limited. ¹
- One-half of needlestick injuries occur after injection or during disposal. ²
- Over 80% of farm workers have accidentally stuck themselves. ²
Disease Prevention

• Disinfect work spaces with designated cleaning solutions:
  • EPA registered disinfectant (AVMA)
  • 1/10 bleach solution – often recommended

• Hand washing with soap and use of paper toweling to dry will decrease chances for disease transmission
  – provide designated hand washing area for workers – hot water use is recommended
  – hand washing station should be designed hands free if possible
Teachable Moments...

• Working in weeds, Hiking & exploring –
  • Sturdy shoes
  • Long pants
  • Insect repellant
    – DEET is frequently recommended by the CDC
    – EPA registered repellants contain 20% or more DEET

• Petting zoos –
  • check rules and policy for visitors
  • wash hands well with soap and warm water
Zoonotic Pregnancy Concerns

• Several diseases that cause abortions in animals have the same results in humans
  – avoid handling tissue from aborted fetus
• Pregnant women have compromised immune and respiratory systems
  – Increased vigilance is called for in hand washing, ppe use, avoidance of animal body fluids & excrement
• Know the risks related to toxoplasmosis, listeria, influenza, Q fever, pharmaceuticals
Zika Virus - current concerns

- Carried by infected mosquitoes
- Hazard in hot, humid, wet environments
- Flooding is a major risk environment
- Symptoms vary from none to fever, rash, headache, joint pain, conjunctivitis
- Guillain-Barre syndrome in some reported cases
- No vaccine available
- Risk in pregnancy: miscarriage, microcephaly in baby
Please remember....

Your local veterinarian is an excellent resource -

*make her/him your BFF!!*
Current Threat

FARM FLOOD HEALTH THREATS
RISK FACTORS DURING RECOVERY

Transmission of disease can occur between humans and animals.
Intense exposure to hot temperatures and high humidity can cause heat related illnesses.
Water may not be safe to drink, cook, bathe or disinfect.

HUMAN & ANIMAL
People can potentially increase the risk of communicable diseases. Waterborne (bacterial), vectorborne (West Nile Virus), prion diseases (BSE), and fungal (aspergillus, mold, yeast) may emerge.

WELL WATER
Water may not be safe to drink, cook or clean with after a flood. Water can become contaminated with microorganisms such as bacteria, viruses, fungi or algae, livestock, and other substances that can cause serious illness.

CHEMICALS
If a chemical, pesticide, or hazardous waste leak occurs, exposure might be released from buildings, homes, and other sources into the environment. Chemical spills could release vapors or chemical fumes. Local and state authorities will provide further guidance.

MOLD
Mold is part of the natural environment. Higher concentrations of mold and bacteria can be found after a flood. This causes the production of mold spores and/or chemical fumes. Local and state authorities will provide further guidance.

STRESS
After a natural disaster, you are dealing with the extra stress of current conditions, along with the added stresses of farm operations. Natural disasters can create a tremendous amount of additional stress and anxiety. You may develop major depression, post-traumatic stress disorder, and post-traumatic stress disorder.

HEAT ILLNESSES
Disaster recovery is physically strenuous, and high humidity can lower the temperature by 10-20 degrees or more. Intense heat exposure can cause heat related illnesses. Signs include excessive thirst, weakness, headaches, loss of consciousness, nausea and vomiting, muscle cramps, and delirium.

RISK FACTORS:

PREVENTION TIPS
- Remove standing water
- Use only NIOSH approved N95 or equivalent respirators when required
- Use waterfowls, silt fences, and barriers, waterproof, cut resistant gloves
- Follow state guidelines on cancer removal

- Sample and test the well water
- Conduct well and pump inspection
- Perform emergency distribution of water that has been treated
- Follow health department opening and testing procedures

- Wear appropriate clothing (bull, boots, long sleeves, long pants, gloves and safety glasses)
- Use a NIOSH approved respirator (N95 or better)
- Wear safety goggles

- Be pro-active, inspect property for signs of stress
- Know your local resources, where you can go for help
- At least a 7-10 foot buffer is critical to the recovery process

FACT SHEETS
- Zoonotic Disease
- EPA Well Disinfection
- Respiratory Selection Guide
- Mental Health
- Heat Illness

FOR MORE INFORMATION VISIT AGIRSAFE.ORG/FLOODCLEANUP

*This list of risk factors is not exhaustive. For example, other risks may include electric shock, drowning, fires, and structural hazards.
Behavioral Health -

*Storm clouds gathering*....
• Rural counties consistently had higher suicide rates than metropolitan counties from 2001-2015

• Suicide is the tenth leading cause of death in the United States.

• There were more than half a million suicides during the 2001-2015 study period.

• “While we’ve seen many causes of death come down in recent years, suicide rates have increased more than 20 percent from 2001 to 2015. And this is especially concerning in rural areas” CDC Director Brenda Fitzgerald, M.D.
Additional Resources
Contact Information

AgriSafe Network: www.agrisafe.org

Charlotte Halverson BSN, COHN-S
Clinical Director
AgriSafe Network
Phone: 866-312-3002 ext. 003
chalverson@agrisafe.org

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