

**AGRICULTURE RELATED  
LUNG DISEASE**

Jeremy Presley, MD  
Western Kansas  
Respiratory Therapy Conference

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Welcome to Dodge City

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**Objectives**

- Will be able to better identify agriculture related lung illness.
- Understand the need or lack of need for treatment in relation to agriculture related lung disease
- Participants will be able to help in patient and provider education of agriculture related lung disease and most importantly prevention strategies.

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-  • Dodge City High School- 1996
-  • Bachelor of Science-Biology, Baker University 2000
-  • Doctor of Medicine- KU Medical Center Wichita 2007
-  • Via Christi Family Medicine Residency- Wichita 2010- Chief Resident

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### Why Ag Lung Diseases?

It effects us all from being a care provider to a community member



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### Ag Lung Diseases

- Hypersensitivity Pneumonitis
- Asthma-like Syndrome
- Asthma/COPD exacerbations
- Organic Dust Toxin Syndrome (OATS)
- Chemical Exposure

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## Hypersensitivity Pneumonitis

- AKA: Extrinsic allergic alveolitis, "Farmer's Lung"
- Etiology: Reaction to bacteria/fungi in spoiled hay or grain. Also poultry/pets.
- Symptoms: Fever, chills, cough, malaise, hypoxia, 4-6hrs after exposure
- PFT's: Low FVC and Low DLCO

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## Hypersensitivity Pneumonitis

- Requires prior antigen exposure
- Imaging: X-ray=may be normal, High Resolution CT=ground glass
- Treatment: Steroid therapy 2-4 wk taper
- Prevention: Respirators

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## High Resolution CT



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## Hypersensitivity Pneumonitis

- Subacute Farmer's Lung: longer term/repetitive exposure with mild symptoms
- Chronic Farmer's Lung: Irreversible pulmonary fibrosis

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## Asthma-like Syndrome

- Etiology: Exposure to combination of dust, endotoxin, & ammonia. Exposure in confinement barns.
- AKA: Reactive Airways Dysfunction Syndrome (RADS)
- Symptoms: wheezing, cough, dyspnea
- Imaging: X-ray=normal

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## Asthma-like Syndrome



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## Asthma-like Syndrome

- Treatment: Albuterol and asthma meds not very effective, steroids are mainstay
- Found to be protective for allergies/asthma as it is not allergy related
- Prevention is best treatment- respirator, limit exposure time, ventilation

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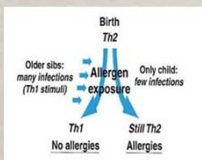
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## Hygiene Hypothesis

- Theory that microbial and endotoxin exposure down regulates immune response in children.




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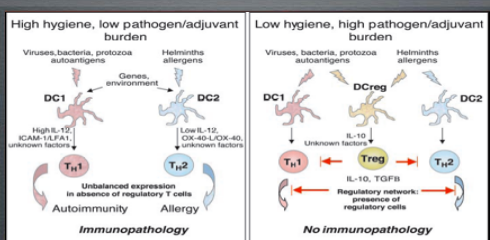
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## Hygiene Hypothesis




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## Organic Dust Toxic Syndrome

- Etiology: Endotoxin or fungal spores attached to dust. Grain bins, silo unloaders lung, hog confinement, 36% of farmers experience
- Symptoms: Flu-like, fever, malaise, cough, myalgias, headache, developing 4-8hrs after exposure, NO hypoxia

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## Organic Dust Toxin Syndrome

- Imaging: X-ray=normal
- Labs: Elevated WBC's
- Treatment: Self-limited, no antibiotics
- Prevention: Respirators, wet down silage before breaking to settle dust

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## Chemical Exposures



- Anhydrous Ammonia-Mucous membrane irritant resulting in pulmonary edema
- Treatment: Intubation and water

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## Chemical Exposures

- Pesticides (organophosphates)
- Symptoms: Bradycardia, wheezing, salivation, respiratory paralysis, odor, pulmonary edema
- Treatment: Atrovent, Atropine until bronchial secretions clear, 2-PAM
- Avoid succinylcholine for RSI

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## Chemical Exposures

- Welding-fumes, Aluminum releases NO, TIG welding releases small amounts of tungsten
- Herbicides-uncertain direct effect, indirect increases leukemia/lymphoma-be aware to this as CXR may look like lymphadenopathy in non-smokers

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## Silo Filler's Disease

- Etiology: fermenting silage produces nitrogen dioxide that induces pulmonary edema
- Symptoms: Cough, burning, fever, nausea/vomiting
- Timeline: Hours to 3 wks after filling. Can relapse in 2-6 wks after original episode

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## Silo Filler's Disease

- Treatment: oxygen, mechanical ventilation, high dose steroids
- Prevention: Avoid exposure

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## Asthma/COPD Exacerbations

- Asthma-
  - Symptoms: wheezing, cough, if related to exposures may only occur at work
  - Treatment: inhaled beta agonists, steroids
  - Prevention: avoid exposures (once asthma developed)

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## Asthma/COPD Exacerbations

- COPD
  - Symptoms: cough, hypoxia, mucous secretions, dyspnea
  - Treatment: inhaled beta agonists, inhaled anticholinergics, inhaled/oral steroids, PD4 inhibitor
  - Prevention: Exposure reduction

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## Zoonotic Infections

- Tuberculosis-Bovine derived
- Q fever: exposure to cattle/sheep/goats. Treat with tetracycline
- Chlamydia pneumonia- exposure to chickens/turkeys/parrots/parakeets. Treat with tetracyclines
- Hantavirus-transmitted from mice
- Swine influenza

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## Other...

- Distiller's Grain: fermented grains used for feed mixture-new to feed market
- Diesel Exhaust- irritant effect that exacerbates asthma/COPD, carcinogen exposure, uncertain effect of new exhaust reduction efforts i.e. DEF, Regen

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## Other...

- Byssinosis "Brown Lung": Cotton fiber inhalation causing asthma like symptoms. Treat with asthma medications and limit exposure
- Breath through your nose-particles >20microns-100% filtered, 5 microns only 50% filtered

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## Prevention



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## Respirators

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## Respirator



- DISPOSABLE DOUBLE STRAP
- Uses: Most any agriculture use but caution with anhydrous ammonia, \$1
- Limitations: No face protection, hot, requires negative pressure breathing and significant effort

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## Respirator



- REUSABLE CARTRIDGE MASK
- Uses: Most any agriculture application, better fit and seal, different cartridges for different exposures, \$30-50
- Limitations: No face protection, hot, requires negative pressure breathing but easier than disposables typically

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## Respirator



- SELF CONTAINED BREATHING APPARATUS
- Uses: Any agriculture environment, face protection, cool air, easy breathing
- Limitations: Cost, bulk as you have to wear the pump, \$1000-1500

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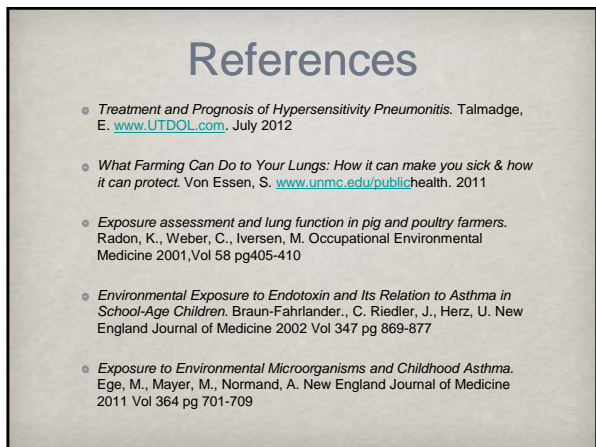
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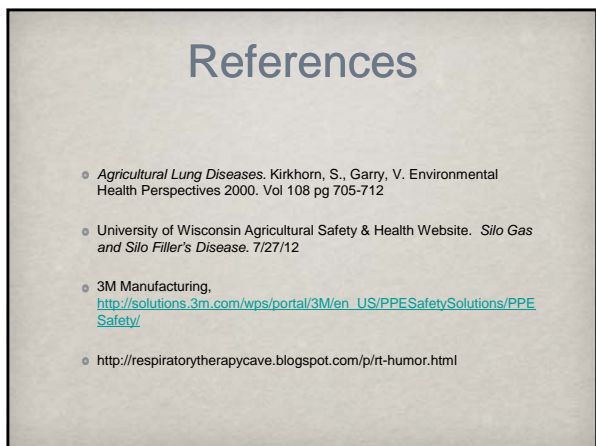
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Questions/  
Comments

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