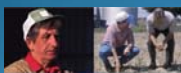


## Gaining Ground on Arthritis in Rural Areas



Gaining Ground on Arthritis



Paul Jones & Rob Stuthridge  
National AgrAbility Project  
Breaking New Ground Resource Center  
Purdue University

1

## Session Outline

- What is AgrAbility
- What is arthritis?
- What arthritis issues impact rural areas?
- How can arthritis be managed?
- What resources are available?
- How does ergonomics relate to arthritis?

2

## AgrAbility

- USDA program to assist agricultural workers with disabilities
  - Funded through the Farm Bill of 1990
  - Currently in 22 states
- Breaking New Ground
  - Founded at Purdue in 1979

3

## Arthritis Defined

- The term arthritis refers to an “inflammation of a joint”.
- It is used to refer to over 100 rheumatic diseases that are characterized by problems in and around joints.

4

## Arthritis: A Nation in Pain

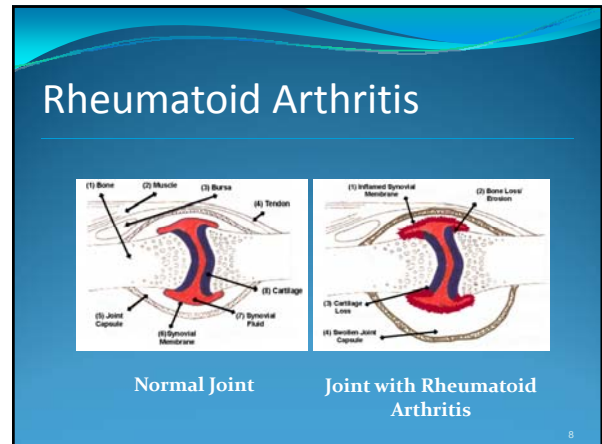
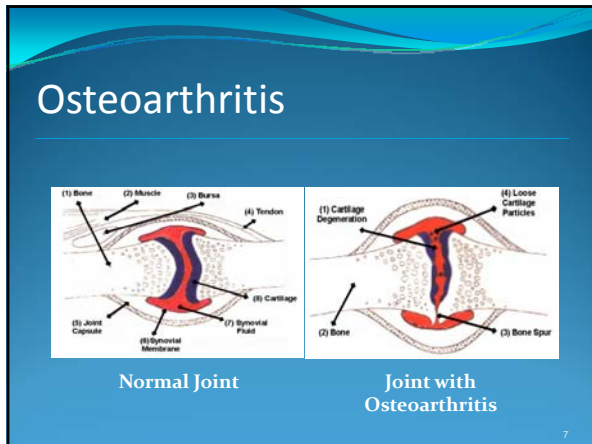
- 46 Million people in the U.S. have doctor - diagnosed Arthritis
- 17.4 million adults experience arthritis attributable activity limitations.
- 1.4 million Hoosiers
- Nearly 300,000 children (approximately 3,000 in Indiana)
- Arthritis is considered one of the leading cause of disability in the United States.
- Overall, women are affected more often than men.

5

## Common Forms of Arthritis

- Osteoarthritis -27 million Americans
- Rheumatoid Arthritis -1.3 million Americans
- Gout -3 million
- Fibromyalgia -5 million
- Juvenile Rheumatoid Arthritis -300,000

6



## Differences between Osteoarthritis and Rheumatoid Arthritis

<u>Osteoarthritis</u>	<u>Rheumatoid Arthritis</u>
<ul style="list-style-type: none"> <li>• Usually begins after age 40</li> </ul>	<ul style="list-style-type: none"> <li>• Usually begins between ages 25-50</li> </ul>
<ul style="list-style-type: none"> <li>• Often affects joints on only <b>ONE</b> side of the body at first</li> </ul>	<ul style="list-style-type: none"> <li>• Usually affects same joint of <b>BOTH</b> sides of the body (symmetry)</li> </ul>
<ul style="list-style-type: none"> <li>• Usually doesn't cause redness, warmth, swelling (inflammation) of a joint</li> </ul>	<ul style="list-style-type: none"> <li>• Causes redness, warmth and swelling of joints</li> </ul>
<ul style="list-style-type: none"> <li>• Affects only certain joints; rarely affects elbows or shoulders</li> </ul>	<ul style="list-style-type: none"> <li>• Affects many joints, including elbows and shoulders</li> </ul>
<ul style="list-style-type: none"> <li>• Doesn't cause a general feeling of sickness</li> </ul>	<ul style="list-style-type: none"> <li>• Often causes a general feeling of sickness, fatigue, weight loss and fever</li> </ul>

## Rural Arthritis Issues

- Rural isolation: transportation issues, lack of support, etc.
- Lack of social services: medical services, insurance, etc.
- Obesity: higher fat diets, less exercise, more T.V., etc.
- Alternative treatments: copper bracelets, cherry juice, home remedies, etc.

## Agriculture Issues

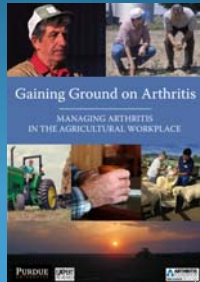
- Physical nature of work
- Types of technologies & tasks
  - High steps, etc.
  - Repeated tasks
- Independent mindset of farmers and ranchers
- Issues related to migrant/seasonal workers
- Unique stressors

## Occupational Risk Factors in Agriculture (Kirkhorn, et. al., 2003)

- Twisting and turning
- Persistent awkward postures
- Reaching and bending
- Heaving lifting
- Compression of weight bearing joints
- Driving for long periods of time
- Walking long distances over uneven ground

## Gaining Ground on Arthritis

- Released in 2007
- Focus on agricultural production
- Basic information applies to anyone with arthritis



## Resources

- Arthritis Foundation  
[www.arthritis.org](http://www.arthritis.org)
- Breaking New Ground  
[www.breakingnewground.info](http://www.breakingnewground.info)
- Centers for Disease Control  
[www.cdc.gov/arthritis/](http://www.cdc.gov/arthritis/)
- Missouri Arthritis Rehabilitation Research and Training Center  
<http://marrtc.missouri.edu/>

## Arthritis in Agriculture

Ergonomics Perspective  
 Robert Stuthridge B.Sc. (Hons), M.Sc.  
 Health Ergonomist  
 Breaking New Ground, Purdue University

## What is Ergonomics?

- Ergonomics: Work (*ergo*) Laws (*nomos*)
- Concerned with all forms of work (any activity – not just employment - involving use of tools).
  - Anatomy: Body construction;
  - Physiology: Body function;
  - Psychology: Behavior, perception, response, capacity (e.g. comprehension, memory, learning);
  - Biomechanics: Engineering view of body;
  - Anthropometry: Physical dimensions (size, strength, range of joint motion).
- Macroergonomics: Organizational design

## Ergonomics & Arthritis

- Four main aspects of work are considered:
  1. POSTURE
  2. FORCE
  3. REPETITION
  4. ENVIRONMENTAL FACTORS

## POSTURE

1. Risk of injury increases outside of mid-third joint range of motion (ROM).

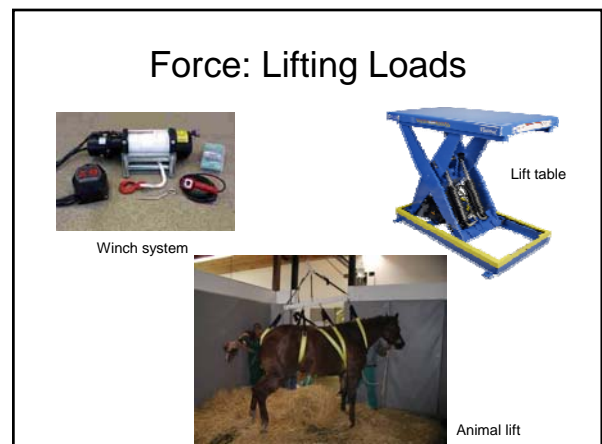
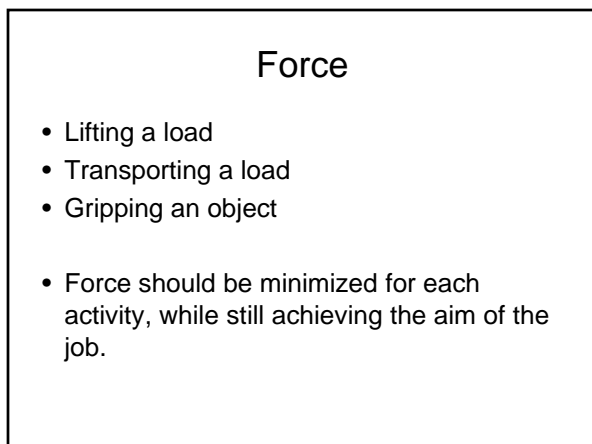
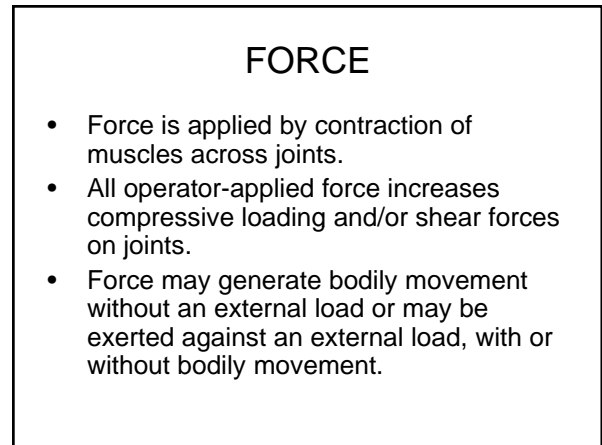
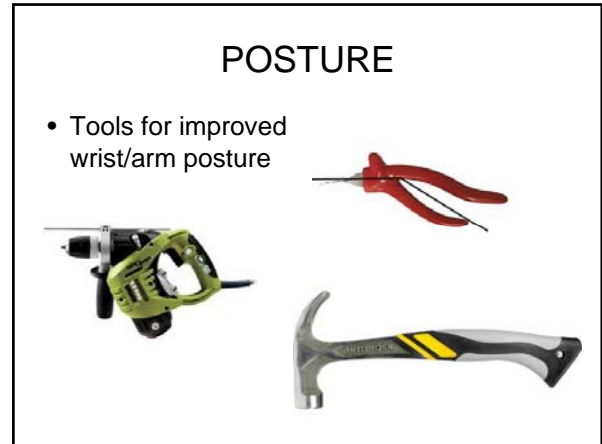
## POSTURE

Consider step heights, hand-holds and handrails. Use extensions to reduce hip, knee, shoulder and hand joint strain.

## POSTURE

'Snovivor' or 'Sno-Easy' shovel  
[www.homebrands.com](http://www.homebrands.com)

Look for hand tools that reduce bending at the hips and knees.



### Force: Transporting Loads



### Force: Gripping Object



Choose tools with comfortable, nonslip cushioned grips. Can also improve existing equipment with foam grips. Don't make handles too large in diameter!

**Optimum handle span** is largely dependent on hand length.  
 Small hands <6.7 inches and medium hands 6.7-7.5 exert most force using up to 2 inch handle span.  
 Large hands >7.5 inches exert most force using 2.4 inch handle span.

### REPETITION

- Even initially 'comfortable' postures and forces can cause pain with enough duration or repetition, e.g. laying, sitting, standing.
- Need to balance mobility/movement with a need to avoid repetitive movements.
- Variation of posture is key.
- Rest/recovery pauses and breaks.



Steering Ball can provide postural options...suitable for fitting to steering wheels of tractors and other vehicles.

### ENVIRONMENTAL FACTORS

- Muscles and joints function best in moderate climatic conditions:
- Temperature
- Humidity
- Wherever possible, control temperature and humidity.
- Where climate cannot be controlled, clothing creates microclimate.



### ENVIRONMENTAL FACTORS

- Clothing – bulky clothing reduces joint range of movement. Choose thinnest layers possible that are thermally efficient.
- Consider 'active' and 'sporting' clothing suppliers as sources of thermal clothing that is not restrictive: Examples snowboarding, climbing, walking, skiing.



### ENVIRONMENTAL FACTORS

- Gloves – for fine tasks: thinnest effective material, good grip, thermally efficient.
- Gloves – for heavy tasks with risk of cuts/bruising: thicker, cut-resistant material can be used. Thick gloves increase joint loading (force requirements).
- Can a tool be used instead of relying on thick gloves?



## ENVIRONMENTAL FACTORS

- Vibration and Mechanical Shock is absorbed by the body.
- Percussive impact on joints, spinal injuries due to vibration and shock.
- Reduce source of vibration and/or isolate user from vibration



Questions