

Musculoskeletal Diseases in Agriculture

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2023

Disclosures

- None

Objectives

- Describe common musculoskeletal problems associated with agriculture, and their causes.
- Describe the anatomical causes of agriculturally related musculoskeletal problems, “danger signs”, and appropriate screening examinations.
- Discuss treatment options for a variety of musculoskeletal problems in agriculture.

Introduction

- Agriculture employs about ½ of the world's entire workforce
- Musculoskeletal injuries are the most common of all occupational injuries for farm workers, especially those involved in labor-intensive practices (Fathallah, 2010; Grisso, 2020)
 - Lifting and carrying heavy loads (over 50#)
 - Sustained full body bending (stoop)
 - Highly repetitive hand work

Introduction

- Musculoskeletal injuries include diseases of the:
 - Bone
 - Joints and supporting structures
 - Nerves
- Common disorders include:
 - Fractures and dislocations
 - Sprains and strains
 - Tendonitis and tenosynovitis
 - Enthesistis and bursitis
 - Arthritis of all types to include traumatic, reactive, infectious, and osteoarthritis

Introduction

- Musculoskeletal injuries are characterized by:
 - Pain and tenderness
 - nociceptive, neurological, and psychological issues all apply
 - Stiffness
 - Edema

Introduction



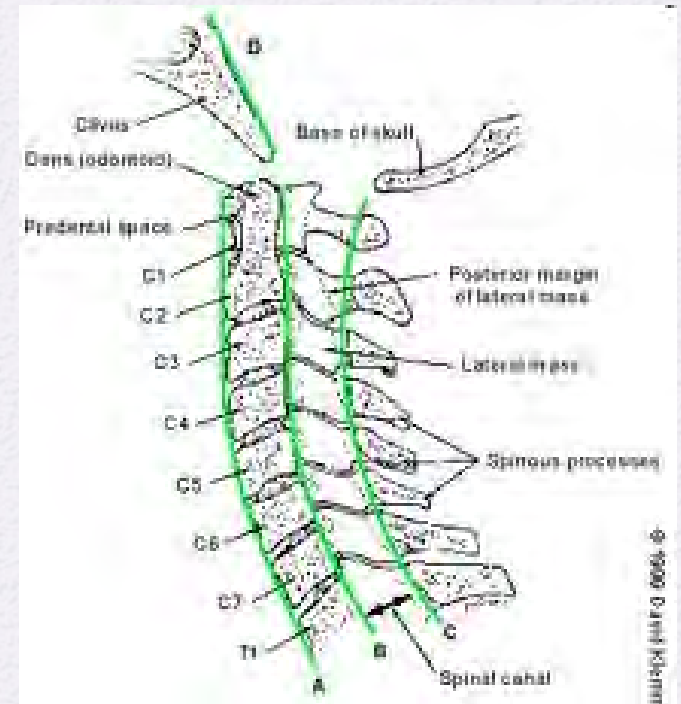
Varghese, et.al. 2022

- Determining cause and effect of often difficult for both the patient and the health care provider.
 - This often becomes important for worker's compensation claims.
- It is important to keep in mind the frequency of the problem in non-agriculture workers, along with potential confounding factors.
 - Age, race, obesity



Neck

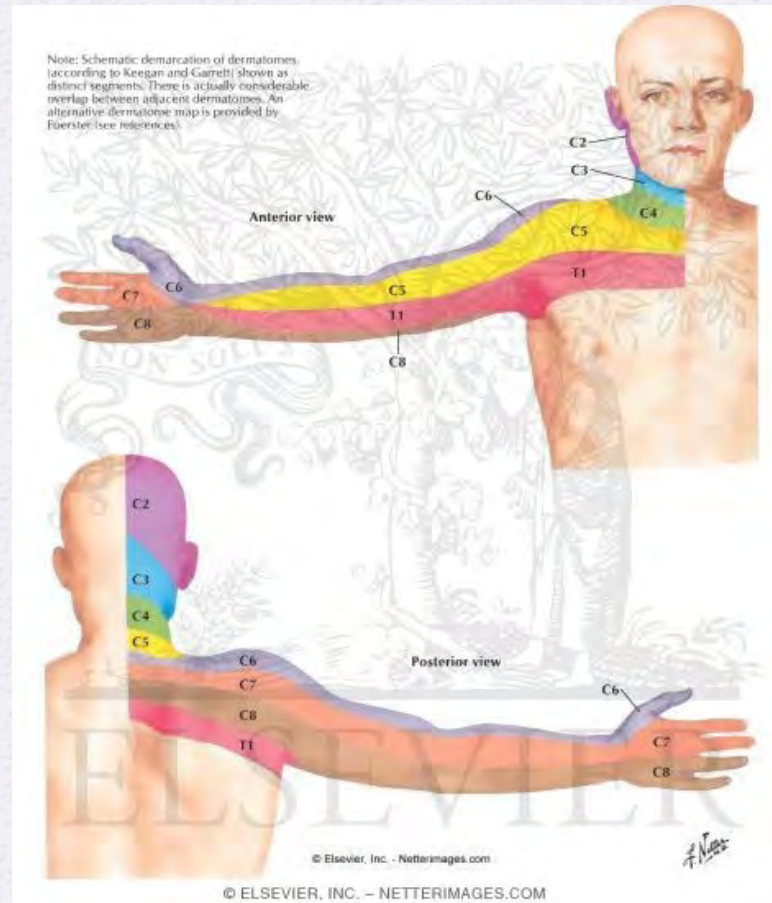
- Neck pain is second to only to LBP as the most common musculoskeletal disorder and is often reported among workers.



Neck

- Cervical Degenerative Disk Disease
 - May be subclinical
 - Can affect nerve roots
 - X-rays may not correlate with symptoms
 - In farmers neck pain can be aggravated by driving tractors and looking to the rear
 - Only in severe cases will there be reflex changes

Neck



Neck

- Warning signs
 - Weight loss, fever, IV drug use
 - Pain that wakes a patient at night
 - Recent infection
 - In cases of trauma, concern for fracture

Neck

- Standard films are indicated for patients with chronic pain or in those with warning signs.
- Early treatment with PT is important
 - Traction, heat, ultrasound
 - NSAID's
 - Steroids, muscle relaxants, etc. are usually not needed for acute syndromes

Lower Back

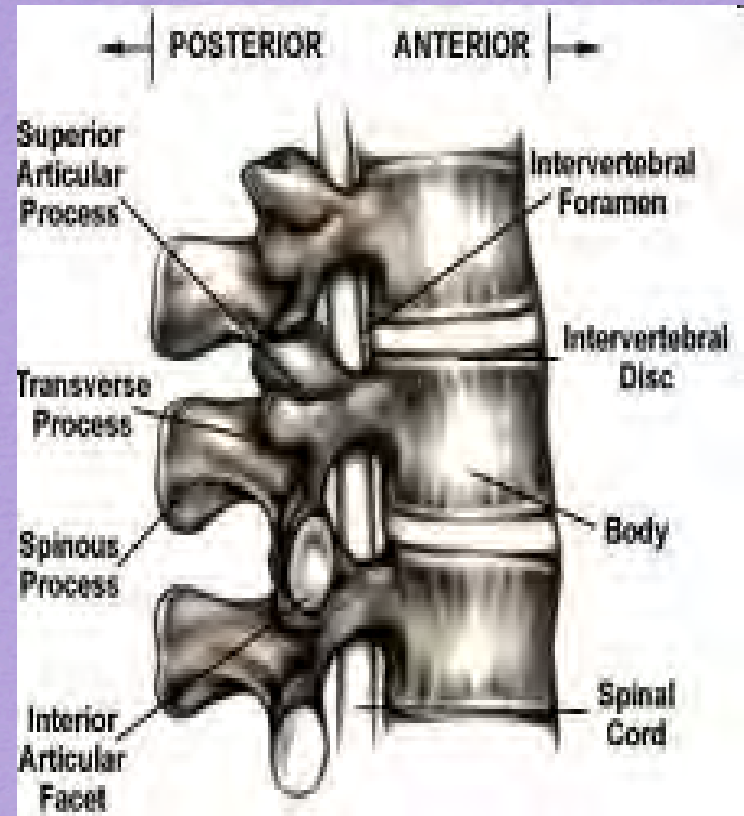
- The annual incidence of low back pain episodes is approximately 50%
 - More than 10% seek medical attention
- Most patients recover without treatment
- Risk factors
 - Heavy lifting, bending and lifting, vibration, and prolonged sitting in a fixed position (farming)

Lower Back

- Many farmers do not seek medical attention

Degenerative disk disease

- Part of the aging process
- Come to the attention of the medical community because of the activities noted
- Like with the neck, x-rays may not correlate with symptoms



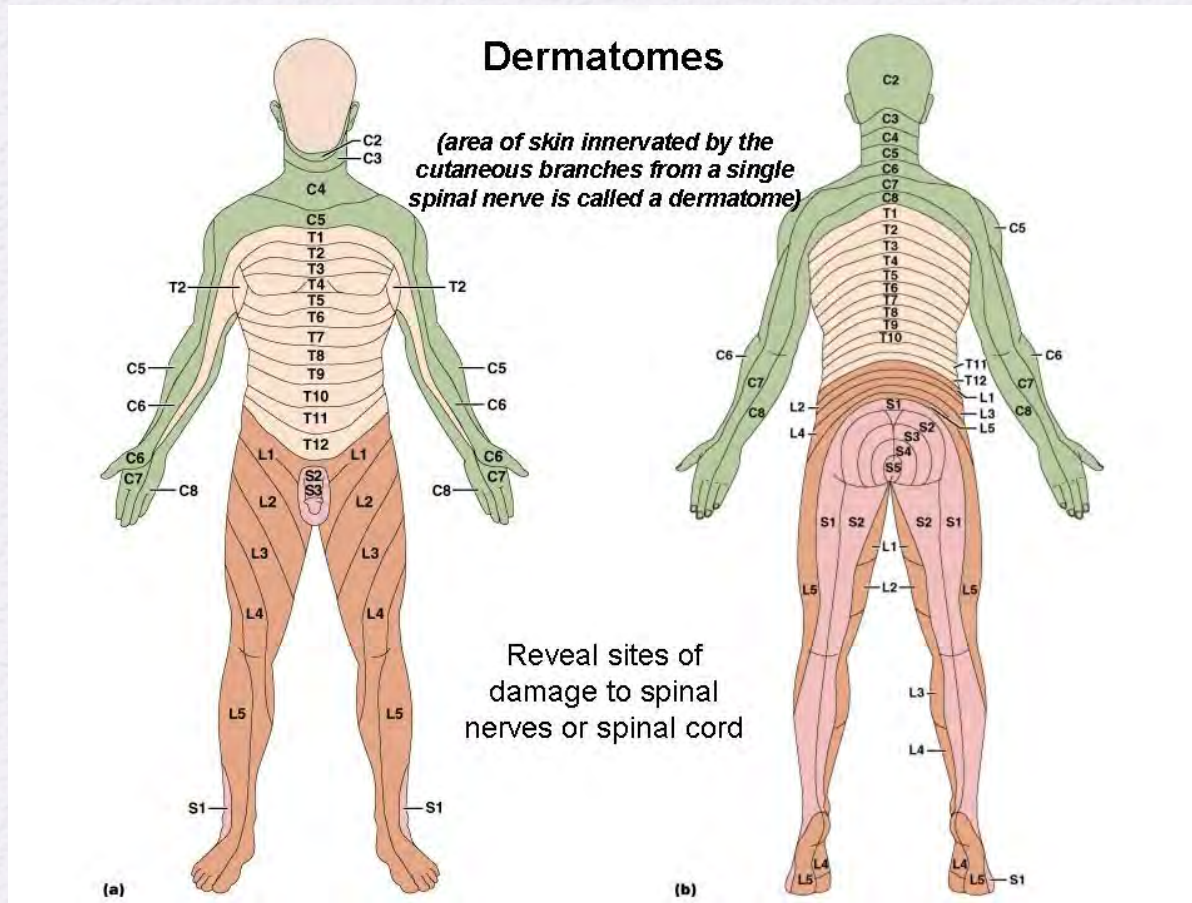
Lower Back

- Degenerative disk disease
 - May be accompanied by sciatica symptoms
 - Almost half of the population have DDD on MRI
 - 1/3 of individuals may not have symptoms
 - Etiology is unclear but appears to have a hereditary component

Lower Back

- Degenerative disk disease
 - Sciatica, weakness, and numbness are caused by pressure on exiting nerves
 - The onset of symptoms may be gradual or sudden
 - Location of pain in the leg may help locate the point of nerve impingement

Lower Back



Lower Back

- There are other causes of LBP:
 - Referred pain from the abdomen and pelvis
 - Warning sign for more severe problems may include fever, diarrhea, bloody urine, painful urination, night time pain, weight loss
- Other diagnosis may include spinal stenosis, spondylosis, ankylosing spondylitis, and coccygodynia

Lower Back

- Treatment is similar to neck pain and is tailored to the diagnosis
 - Physical therapy
 - NSAID's
 - Muscle relaxants
 - Exercise



Shoulder

- The shoulder is a very movable joint and is important in most daily activities
- Made up of several joints
 - Glenohumoral
 - Acromioclavicular
- Very common injury as it relate to occupational injuries



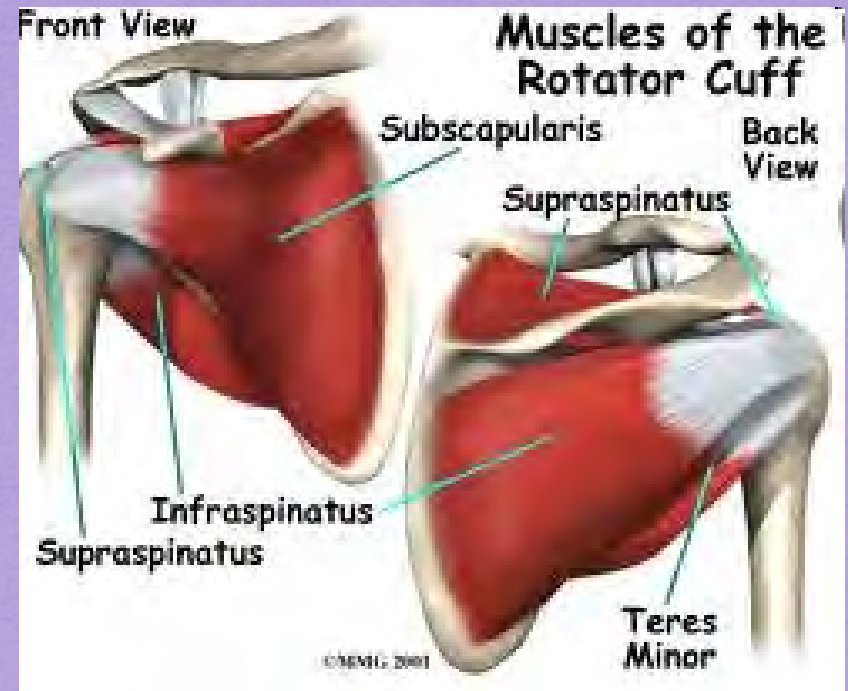
spectrumwellness.com

Shoulder

- Farming puts many stressors on the shoulder
 - Lifting, pulling, vibratory and repetitive activities
- Because of the stress placed on the joint there may be a higher incidence of OA of the true shoulder joint

Shoulder

- Impingement
 - Related to tendonitis
 - May be related to overuse
 - Often involves the tendons of the rotator cuff (SITS)



Shoulder

A Pain provocation test: painful arc test

Examiner brings patient's shoulder into full abduction.

120°
90°
60°
180°

No pain
Subacromial pain
Subacromial pain
No pain

Positive test result: shoulder pain between 60° and 120° indicates subacromial or rotator cuff disorder.

B Strength tests

Internal rotation lag test (subscapularis muscle)

Hand of affected arm is lifted off of back by examiner, and patient is asked to maintain position.

90° flexion

Subscapularis muscle
Humerus

ANTERIOR
POSTERIOR

Positive test result: patient is unable to maintain the position.

External rotation lag test (supraspinatus and infraspinatus muscles)

Examiner passively rotates the patient's arm into full external rotation.

90° flexion
20° abduction

Supraspinatus and infraspinatus muscles
Humerus

POSTERIOR
ANTERIOR

Positive test result: patient is unable to maintain a position of full external rotation.

C Composite test: external rotation resistance test (infraspinatus muscle)

90° flexion

Examiner applies pressure proximal to the patient's wrist against external rotation by the patient.

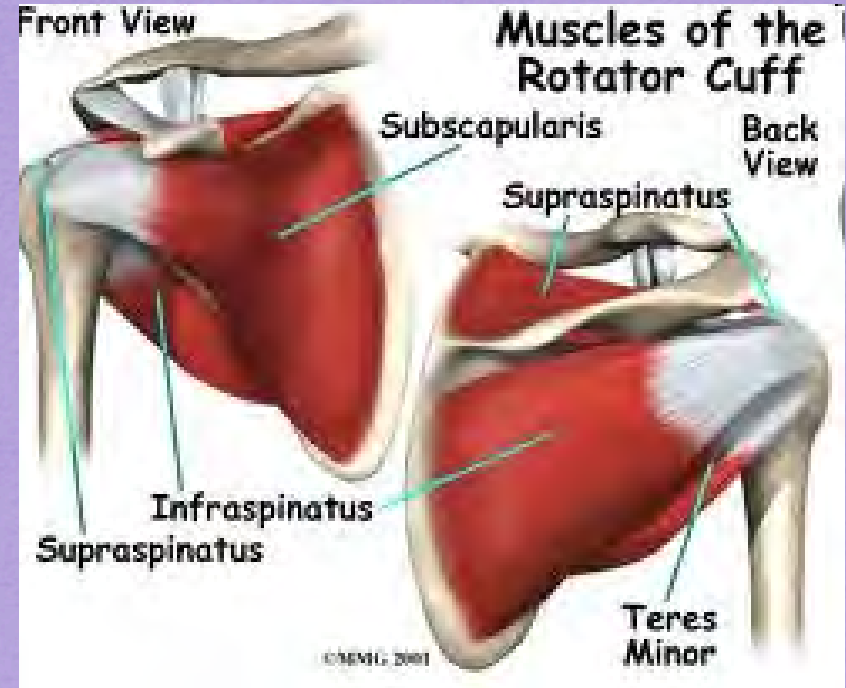
Positive test result: patient experiences either pain or weakness during the maneuver.

Drop arm test (supraspinatus muscle)

Patient is asked to lower the arm slowly from abduction.

Positive test result: immediate drop of the arm accompanied by pain.

JBIRD
C. Lynn



Timberlanept.com

Shoulder

- Adhesive capsulitis
 - Also called frozen shoulder
 - May be related to diabetes
 - Treated with aggressive PT
 - Often self limited but can be very disabling

Elbow and Hands

- Epicondylitis
 - Can be either medial (golfers) or lateral (tennis) in location
 - Results from inflammation of the insertion of tendons from the hands around the elbow
 - Tennis elbow is much more common
 - Related to repetitive activity



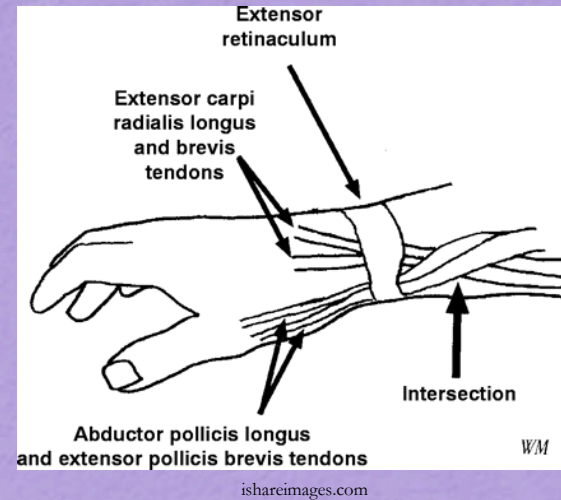
Elbow and Hands

- Epicondylitis
 - Pain can be localized or can radiate
 - Symptoms are worse with activity
 - Treatment is rest, PT, and splints
 - Injections are to be used judiciously

Elbow and Hands

De Quervain's Tenosynovitis

- Tendonitis of the tendons of the wrist and thumb
- Related to overuse
- Treated with rest, NSAID's, and splint
- May require infection
- DDX: intersection syndrome



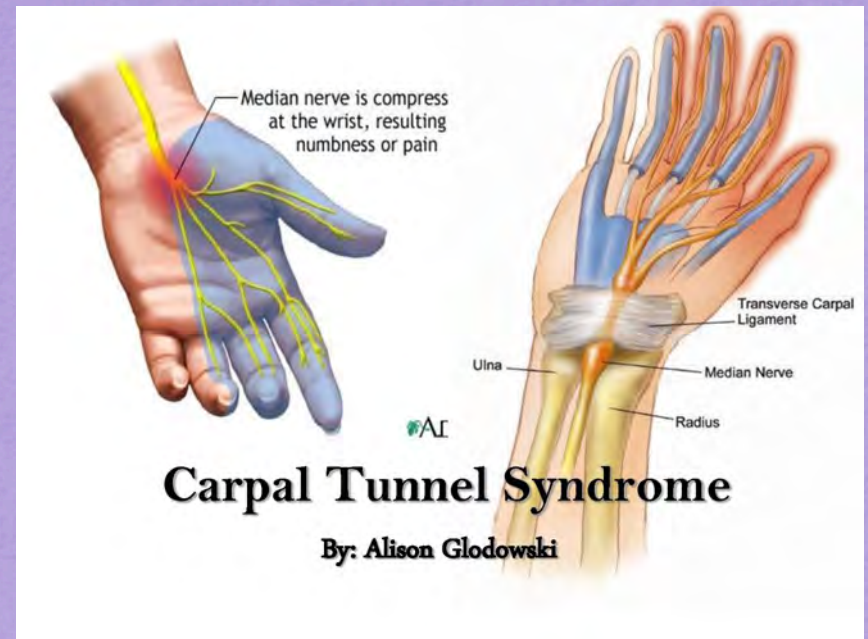
Trigger finger

- Related to tendonitis of the finger and associated with nodule formation
- Treated with rest, NSAID's and often injection



Elbow and Hands

- Carpal tunnel syndrome
 - Common disorder associated with hand pain
 - Nerve compression as the median nerve passes through the carpal tunnel

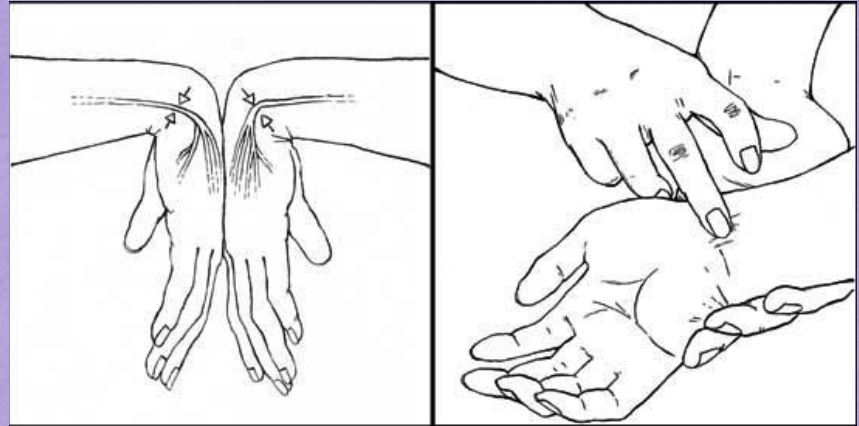


Elbow and Hands

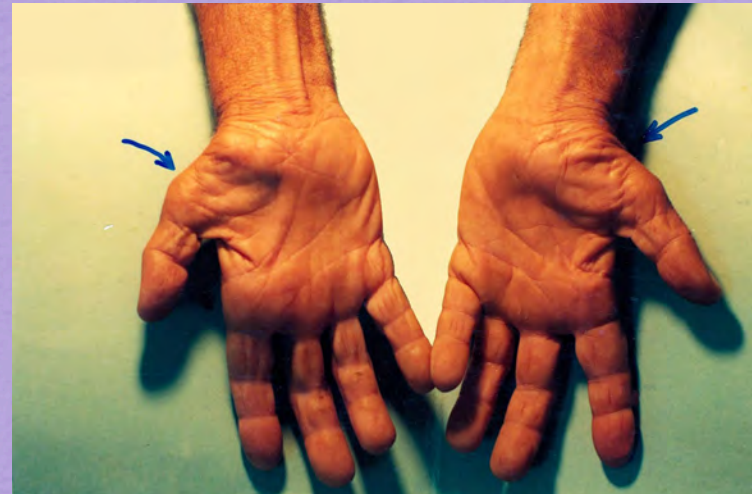
- Carpal tunnel syndrome
 - Has been associated with overuse
 - Also associated with pregnancy, thyroid disease, and inflammatory arthritis such as rheumatoid arthritis
 - In farming may be related to activities that involve vibration, milking, and being female
 - Symptoms of pain and paresthesia of the hand

Elbow and Hands

- Carpal tunnel syndrome
 - Symptoms classically involve 2 ½ fingers and is worse at night
 - Shaking the hand may relieve symptoms
 - Testing and diagnosis
 - Phalen and Tinel's signs
 - Look for signs of motor involvement
 - EMG/NCV



tsebiomedia.com



en.wikipedia.org

Elbow and Hands

- Carpal tunnel syndrome
 - Treatment include rest, NSAID's, splints, injection and/or surgery



Ergonomics

- Farmers have been historically self reliant and will change practices out of necessity
 - Tractors
 - Increased morbidity and mortality issue
 - Issue associated with roll over accidents
- Many tools have been developed to reduce bending and repetitive activities
 - Powered shears

Ergonomics

- Efforts have been made to reduce stooping and awkward body positioning
 - Prone workstations in fields
 - Picking platforms
- Efforts are still being made to push effective ergonomic interventions
 - Costs are a major concern

Conclusion

- Recognize agriculture related musculoskeletal problems and there diagnosis and treatment.
- Identify warning signs for further evaluation
- Be aware of ergonomic research and how it may affect future farming practices

References and Suggested Reading

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