LET’S TALK ABOUT THE SPINE

Carol Vandenakker Albanese, MD
Health Sciences Clinical Professor
Physical Medicine and Rehabilitation
University of California, Davis, School of Medicine

Promoting Healthy Ideas: PHI’s 11th International Conference
June 2, 2014
The Spine

- Supports the trunk
- Stabilizes the limbs
- Protects the spinal cord and nerve roots
- Allows multidirectional movement
Spinal Cord Anatomy
Muscles that support the Spine
Effect of Paralytic Polio on the Spine

- Virus attacks the cell body of motor nerves in the spinal cord
- Paralysis or partial paralysis of muscles results
- Asymmetry of skeletal or spine support
- Spine bone growth may be affected
Effect of Paralytic Polio on the Spine

• Loss of bone strength
• Altered body mechanics
• Secondary deformity
• Increased stress on spine segments
• Increased stress on supporting soft tissue
Spinal Problems in the Polio Survivor

- Spinal deformity
- Osteoporosis
- Accelerated degeneration
- Symptoms related to nerve impingement secondary to spine degeneration can mimic post-polio syndrome
Spinal Deformity

• Spinal deformity may be alteration or exaggeration of normal curves
  – Thoracic kyphosis
  – Lumbar lordosis

• Spinal deformity may be abnormal curves
  – Scoliosis

May result from weak back muscles or from poor posture (bent over position when standing or sitting).

May result from weak stomach muscles, from hip contractures, or from the way a child walks to make up for a weak leg or hip.
Spinal Deformity - Scoliosis

• Risk of scoliosis in a polio survivor is 30%
• Results from:
  – Asymmetric weakness of trunk muscles: intercostal, abdominal, paraspinal
  – Pelvic weakness/ tilt
  – Leg length difference
• Progression of curve correlated to degree of weakness and age at onset of curve
• Bracing is often not successful in preventing progression and surgical fusion often recommended
Scoliosis

• Risk of dramatic increase during adolescent growth spurt
• Severe scoliosis reduces lung capacity and function
• Scoliosis causes bony pressure points when sitting or lying down
Scoliosis

• Progression can continue after skeletal maturity due to degenerative changes:
  – Asymmetrical disk degeneration
  – Vertebral compression fractures
  – Lateral slippage of vertebrae (spondylolisthesis)

• Progression can cause:
  – Pain
  – Nerve impingement
  – Unbalanced spine
  – Reduced lung function
Osteoporosis

• Progression can continue after skeletal maturity due to degenerative changes:
  – Asymmetrical disk degeneration
  – Vertebral compression fractures
  – Lateral slippage of vertebrae (spondylololisthesis)

• Progression can cause:
  – Pain
  – Nerve impingement
  – Unbalanced spine
  – Reduced lung function
Osteoporosis

• Polio survivors are at increased risk of osteoporosis based on:
  – Reduced peak mass
  – Reduced muscle action on bone
  – Reduced mobility

• Spine (vertebral) fractures may occur with falls / trauma or spontaneously if bone is very weak
Osteoporosis

- Vertebral compression fractures may contribute to progression of spinal curves
  - Increased thoracic kyphosis
  - Increased scoliosis
Spine Degeneration

• Spine degeneration is common in the general population
• Polio survivors often have increased stress on the spine related to loss or asymmetry of muscle support and altered mechanics of movement
• Spinal curves often progress with degenerative changes
Spine Degeneration

- Degeneration in the spine can start with disc degeneration or arthritis in the facet joints.
- Degeneration in one area puts increased stress on the other structures and eventually degeneration occurs in both.
- Secondary osteophytes (bone spurs) form and ligaments enlarge.
Spine Degeneration

- Degeneration in the joints can allow slippage of vertebrae forward, backward or to the side (spondylolisthesis)
- Slippage of vertebrae, enlargement of joints and ligaments, and bulging discs all reduce the space around nerves (stenosis) and can result in nerve compression
Nerve Compression

• Single level nerve compression can cause pain, weakness and/or loss of sensation in specific pattern in a limb
• Pain may be constant or intermittent
• Pain may be related to position or activity
Spinal Stenosis

- Spinal stenosis refers to narrowing of the spinal canal.
- It is commonly a result of degenerative changes including disc bulging, facet and ligament hypertrophy and osteophytes.
- Onset often gradual with progressive increase in symptoms but may be acute.
Spinal Stenosis Symptoms

• Cervical stenosis: loss of balance
• Lumbar stenosis: Pain in buttocks or legs
  – Described as deep ache, increasing over time while standing or walking;
  – May also report abnormal sensation or weakness
  – Relieved with sitting
  – Pain with walking, but easier with shopping cart or walker (forward flexed position)
  – Standing worse than walking; must sit to alleviate pain
• May be confused with symptoms of post-polio syndrome
Spinal Degeneration

• Symptoms related to spine degeneration include:
  – Back pain
  – Leg pain and/or weakness
  – Loss of sensation
  – Change in bowel/bladder control
  – Difficulty breathing
  – Increased fatigue
  – Increased loss of balance
  – Increased frequency of falls
Treatment of Spinal Disorders

- Medical evaluation is important to identify cause of symptoms and focus treatment (Spine specialist)
- Physical therapy (stay tuned for more!)
- Medications for pain control
- Bracing
- Injection procedures
- Surgical intervention for nerve impingements and unstable spine
Treatment of Spinal Disorders

• Pain Medications
  – Mild to moderate pain:
    • Acetaminophen used in moderation – least side effects
    • Anti-inflammatories – may cause gastritis/ ulcers
  – Severe pain:
    • Narcotics – cause drowsiness, fatigue, constipation, tolerance
    • Neuroleptics – also cause drowsiness, “spacey” feeling
Treatment of Spinal Disorders

• Spine Braces
  – May be semi-rigid or rigid
  – Reduce motion
  – Provide support
  – Custom molded, semi-custom, or off-the-shelf
  – May be uncomfortable, difficult to sit
  – Do not cause harm
Treatment of Spinal Disorders

• Injections:
  – Helpful for inflamed nerves/joints
  – Nerve blocks can help pain from joint degeneration
  – Relief usually temporary

• Surgical Intervention:
  – Nerve compression with loss of function or severe pain
  – Unstable spine
Treatment of Spinal Disorders

• Preferred management:
  – Topical medications/ modalities
  – Lifestyle changes
  – Activity modification
  – Physical therapy
Summary

• Spine problems in polio survivors are common
• Common problems include:
  – Scoliosis or other spinal deformity
  – Osteoporosis
  – Degenerative changes
  – Nerve compression
• Problems related to the spine may be confused with symptoms of post-polio syndrome:
  – New weakness
  – Increased fatigue
  – Leg pain with walking/relieved with rest
  – Increased difficulty breathing
• Treatment options include:
  – Pain medications
  – Bracing
  – Injections
  – Surgery
  – Physical therapy