Objectives

Following the conclusion of this activity, participants will be better able to

• Identify several sources of musculoskeletal (MSK) pain in children and adolescents
• Discuss the role of primary care physician in treating MSK pain
• Define when to refer to a subspecialist
Background

• High incidence of idiopathic musculoskeletal pain in healthy children and adolescents

• ~25% of new patient evaluations in pediatric rheumatology are diagnosed with non-inflammatory pain syndromes

Case #1

• 14-year-old Caucasian female with inability to move left arm due to pain. Reports that she has kept her arm in a sling and now braces it for comfort. Her pain is exacerbated by movement and touch (including showering). She reports that she is unable to move her arm, and it is “frozen” including her fingers

• Denies trauma. Reports diffuse finger swelling
Case #2

- 8-year-old boy previously with h/o growing pains. Over the last year has experienced “bone pain” that comes and goes in the lower extremities. It has become progressive to point of needing a wheelchair to get around for longer distances. Parents picked up the wheelchair.

- Has been seen multiple times by PCP, recently evaluated by orthopedics. Mother reports work-up normal.

Case #3

- 16-year-old-female with c/o whole body pain. Endorses joint pain, muscle pain. Also reports that her joints swell at times. Mom reports that patient is an “A” student despite missing at least 1-2 school days/week.

- +Fatigue, weakness, headaches, dizziness, chest pain, abdominal pain, constipation, diarrhea, difficulty with memory, problems sleeping.
Types of Non-inflammatory Pain Occurring in Pediatrics

- Growing pains
- Hypermobility → Ehlers Danlos Syndrome
- Fibromyalgia
- Complex regional pain syndrome
- Chronic sports-related pain syndromes
- Low back pain
- Others (malignancy)

Growing Pains

- Most common reasons for aches and pains
- Ages affected: 2 years up to 12
- Pain occurs due to ligaments not keeping up at the rate of bone growth
- Non-articular; usually thighs and shins
- Intermittent
- Pain episodes can occur at any time of day but tend to occur most commonly before sleep
- Pain may be quite uncomfortable
- Generally resolves in 30 minutes but can last for a few hours
- Relieved with heat and massage
Hypermobility Syndrome

• Other names: ligamentous laxity, double-jointedness, hyperlaxity, or benign joint hypermobility syndrome (BJHS)
• Joints move beyond the normal limits
• Inherited but may be acquired (i.e. ballet dancers or gymnasts)
• Causes: Misaligned joints, abnormally shaped ends of one or more bones at a joint, collagen defects, or abnormal joint proprioception
• Estimations that ~10-15% of normal children have hypermobile joints

Hypermobility Syndrome

• Patient usually looks well and moves well
• Joint pain or transient mild swelling
• Joint stiffness, clicking, popping, instability
• Dislocations or sprains
• Scoliosis
• Joint hypermobility tends to decrease with age
• Beighton score 5/9 (may be along the spectrum of EDS)
• Supportive care
Fibromyalgia

• Fibromyalgia (FM) is an idiopathic chronic pain syndrome
  – Widespread nonarticular musculoskeletal pain and discrete tender points – unlike adults, pediatric patients only require 5 tender points for 3 + months
  – May include associated fatigue, non-refreshing sleep, anxiety, stress, headaches, irritable bowel syndrome, paresthesias, and Raynaud’s phenomena
  – ROS often pan-positive

Epidemiology

• Prevalence ~6% in school-aged children; more frequent in adolescents
• F>M
• Type A personality
• Perfect child
• Average age – 13 yrs.
• Etiology? CSS
Clinical Manifestations and PE

- Widespread, discrete tender points located in multiple areas, persistent pain
- No objective evidence of arthritis
  - Caveat → some pediatric patients with JIA, Spondyloarthritis and SLE have concomitant chronic pain syndrome

Complex Regional Pain Syndrome (CRPS)

- Synonyms: Reflex Sympathetic Dystrophy, Localized Idiopathic Musculoskeletal Pain Syndrome
- Extremely severe limb pain of unknown cause (? trauma) frequently associated with skin changes
- Frequency unknown
- More common in adolescents
  - (Average onset age ~ 12 years) and F>M
Clinical Manifestations

• Long-term history of intense limb pain that is unresponsive to different therapies and amplified over time

• Frequently, it results in the inability to use the affected limb

PE Findings of CRPS

• Allodynia

• Subset of patients develops skin color changes (pallid or purple mottled appearance), cool extremity or perspiration

• Swelling of a limb

• Unusual postures, with refusal of any movement
Diagnosis of CRPS

• Clinical diagnosis

• The combination of complaints and clinical findings is characteristic

• Laboratory studies are normal (such as ESR, CRP)

• MRI may show non-specific alterations of the bone

What Causes These Idiopathic Types of Non-inflammatory MSK Pain?

Underlying cause unknown but may be related to many biologic and psychologic factors

• Sleep disturbance

• Stress

• Altered pain perception (including from trauma)

• Hypothalamic-pituitary-adrenal dysregulation and neuroendocrine axes

• Central nervous system sensitization is a major pathophysiologic aspect
Central Nervous System Sensitization

• Spinal cord has a short circuit
  – This circuit sends the pain message to the neurovascular nerves as well, so patients experience pain both in the brain and in their autonomic nerves

• Nerves leading to blood vessels to cut flow →
  – O$_2$ deprivation to bones, muscles and skin
  – Lactic acid and other waste products build up
  – End result is more pain
  – As pain builds, blood flow decreases further, causing a vicious cycle

Modulating Pain Factors

• Anxiety
• Stress
• Activity
• Weather changes
Impact of Pain on Pediatric/Adolescent Patients

- Depression
- Anxiety
- Insomnia
- School issues
- Isolation
- Family stress/changes in family dynamics

Treatment of “Normal” Pain

- Massage
- Icing
- Warm bath
- Temporarily resting the achy body part may help (if overuse)
- OTC topical ointments containing menthol or capsaicin
  - Caution: do not apply over irritated skin, open wounds or near the eye due to irritation
- Some children may feel better with OTC pain medication such as acetaminophen or ibuprofen
Treatment of “Intensified” Pain

• Acknowledge that pain is real
• Therapy is multifaceted
  – Intensive PT (aquatic, land)
    • +/- myofascial release
    • +/- TENS
  – Psychology to help address pain coping mechanisms via CBT, guided visual imagery among other techniques
  – Psychiatry +/- if anxiety/depression a major feature
• Goal of treatment is to make patient functional

Medications?

• NSAID
• Low dose tricyclic antidepressants
  – Amitriptyline (Elavil)
• Antidepressants
  – Duloxetine (Lyrica)
  – Milnacipran (Savella)
• Antiepileptics
  – Gabapentin (Neurontin)
  – Pregabalin (Lyrica)

Narcotics are ineffective for chronic pain
• Eastern Medicine
  – Acupuncture
Referring Your Patient

- Joint pain is associated with joint swelling, decreased movement, increased warmth that persists
- Child non-ambulatory
- MSK pain associated fever and rash
- Pain that wakes your child from sleep associated weight loss and/or fever
- Pain out of proportion to exam findings

Challenges

Patients Beliefs
- I have to live with pain
- I shouldn't do anything that hurts
- It’s up to the doctor to fix me
- I have pain, so, I am damaged

MD Must Emphasize
- Pain does not equal tissue damage
- The brain has changed due to CSS
- Retrain the brain and work on it daily
- It is necessary to break away from unhelpful concepts
  - Stress impacts pain
  - Asking about pain
- No magic pill exists

Family Dynamics
- Enmeshment
Therapeutic Team

Collaboration among providers

• PCP

• Other specialists
  – PMR
  – Rheumatology (7 rheumatology attendings)
  – Pain service (Anesthesia – Dr. Caro Monico, Dr. Grace Kao, PNPs Angie Medellin and Hillary Cloyd)
  – Others

Take Home Points

• Validation of pain is important
• Multidisciplinary approach optimal
• Narcotics are ineffective
• Early intervention is important to avoid “spreading of pain”
• PT is well tolerated