Hypermobility Syndromes

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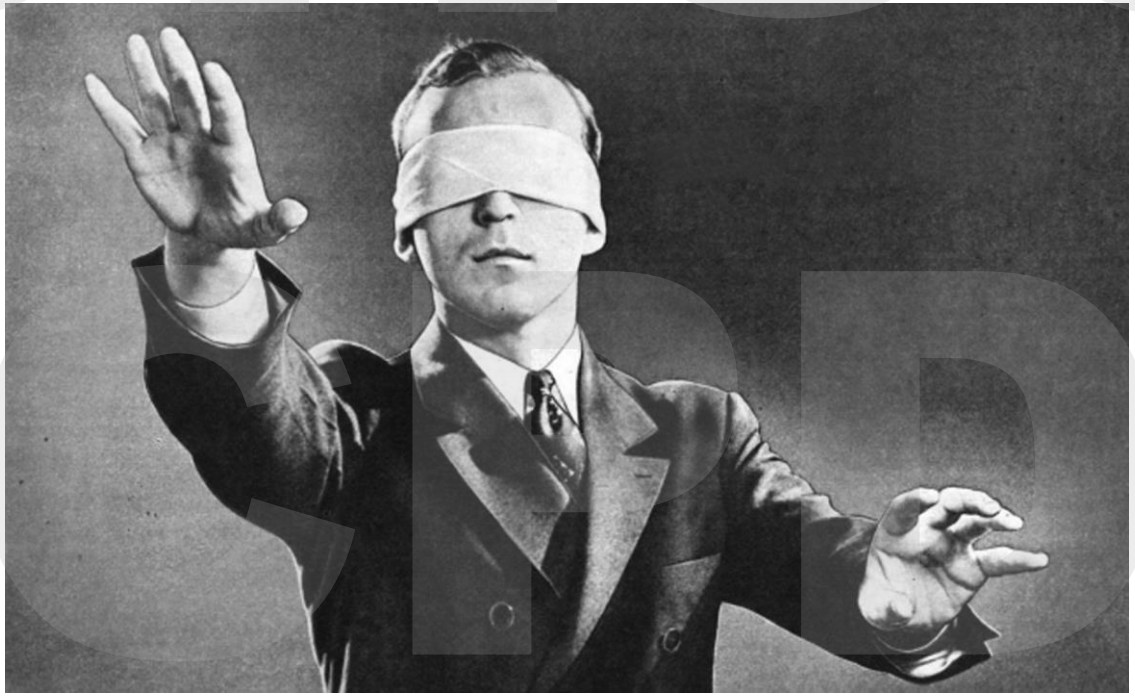
A little about me…

- Physical Medicine & Rehabilitation/Physiatry
- Trained at University of Pittsburgh Medical Center
- Private practice Chicago
- “Nonoperative orthopedics”
  - PT management
  - US diagnosis, injections
  - Corticosteroid injections
  - PRP, prolotherapy
  - Spine injections
  - etc

No disclosures

Well, one thing to disclose

- Low evidence zone



Why discuss it?

- Underdiagnosed syndrome
- Online forums, support groups
- “Medicalization”
- We don’t talk about it much

- Hypermobility syndromes
- Epidemiology
- Diagnosis
- General Complaints
- MSK Complaints
- General Treatment Principles
- Take Home Points

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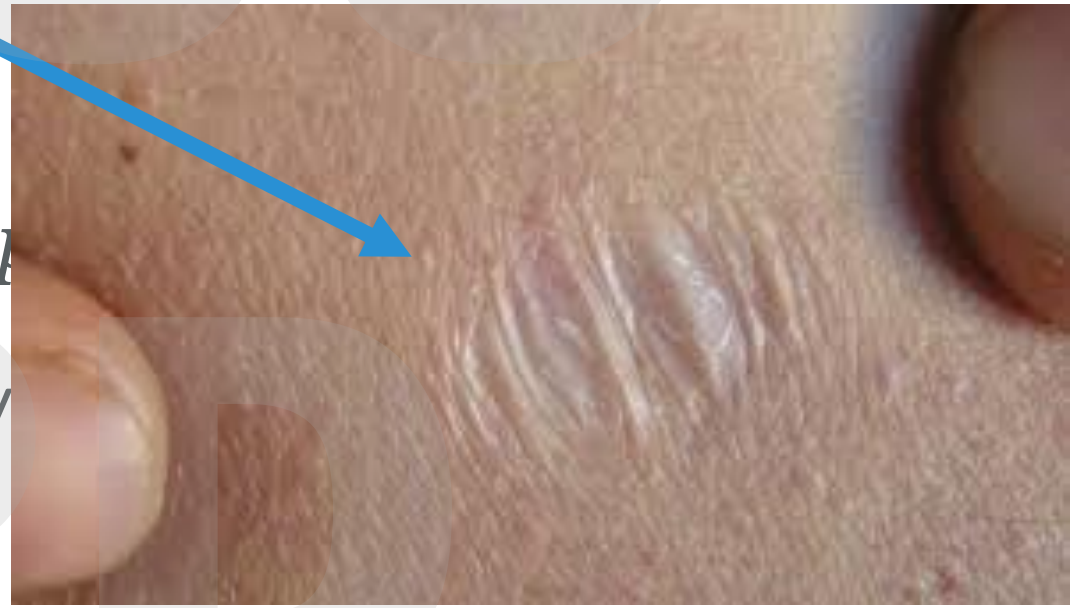
Hypermobility Syndromes[1,2]

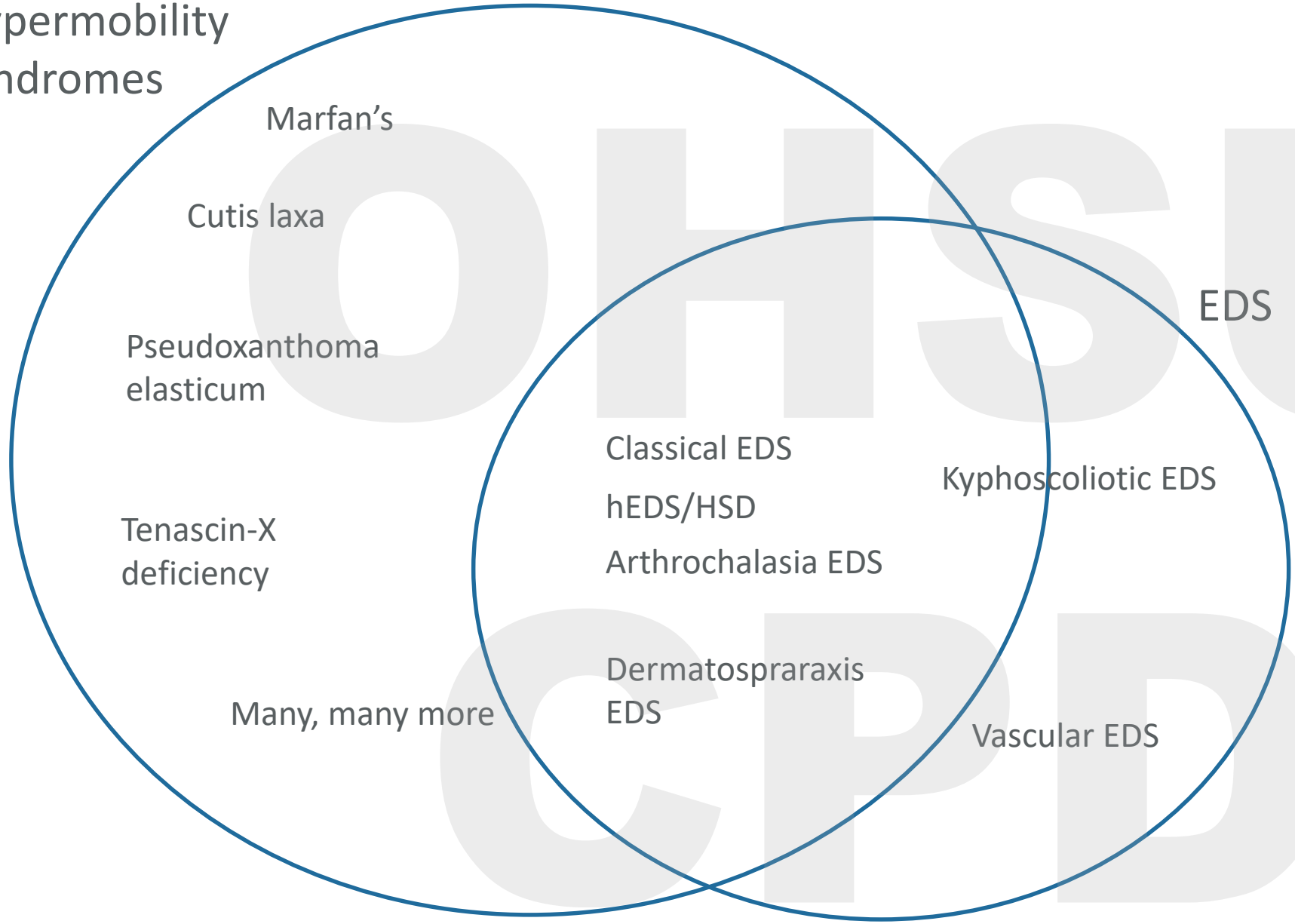
- Classical Ehlers Danlos Syndrome (EDS)
  - Poor wound healing, “papyraceous” skin
  - Bruising
  - Joint hypermobility
  - AD type V collagen defect
- Hypermobile type (hEDS) or *hyp*
  spectrum disorders
  - Mild skin involvement “velvety
  - Unclear genetics – AD likely
    - Disordered collagen
  - Female predominant
  - Most common



Hypermobility Syndromes[1,2]

- Vascular type EDS
  - Dangerous, bowel and artery rupture
  - Skin/joint less severe
  - Bruising
  - AD, type III collagen defect
- Kyphoscoliotic type EDS
  - Ocular globe fragility
  - Severe scoliosis
  - Skin/joint laxity
  - AR

Hypermobility syndromes



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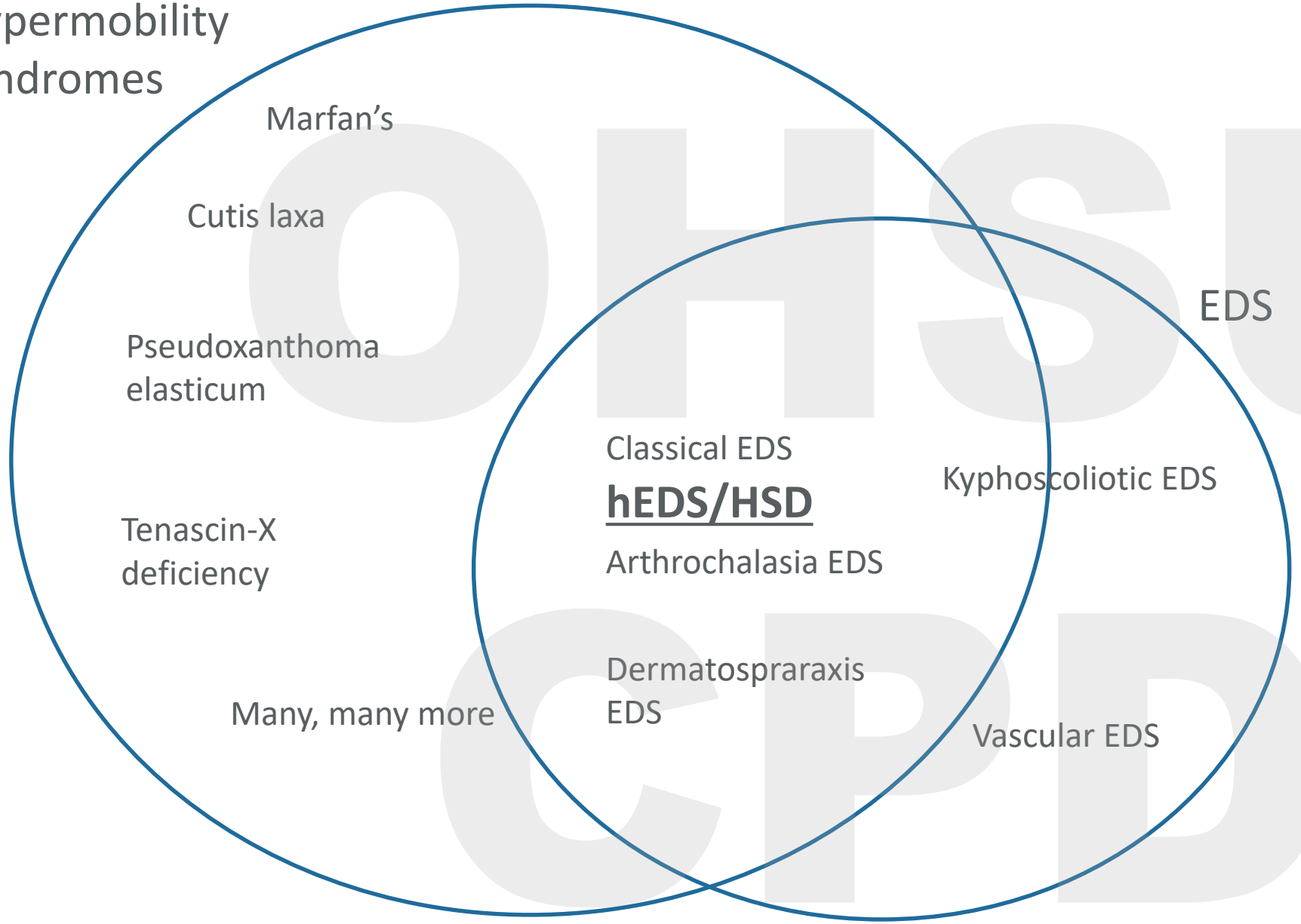
Hypermobility syndromes



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Hypermobile type EDS
Hypermobility spectrum disorders

Familial Articular Hypermobility
Generalized joint hypermobility
Joint hypermobility syndrome

Hypermobile type EDS

Variable Expression[26]

- Poorly understood pathogenesis, component of pleiotrophy
- Modifiers strongly related to MSK features
  - Sex
  - Mechanical forces
  - Lifestyle
  - Job
  - Accidents
- “Secondary effects mediated by joint hypermobility”

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hEDS Epidemiology[3,4]

- Overall hypermobility 10-20% population
  - Children/adolescents
  - Female
  - Asian
  - West African
  - African American > Caucasian
- Hypermobility + pain (HSD) = ~3% in UK population
  - Estimated 1/500 overall
- Reduced prevalence hypermobility in older
  - ?scarring
  - ?age related

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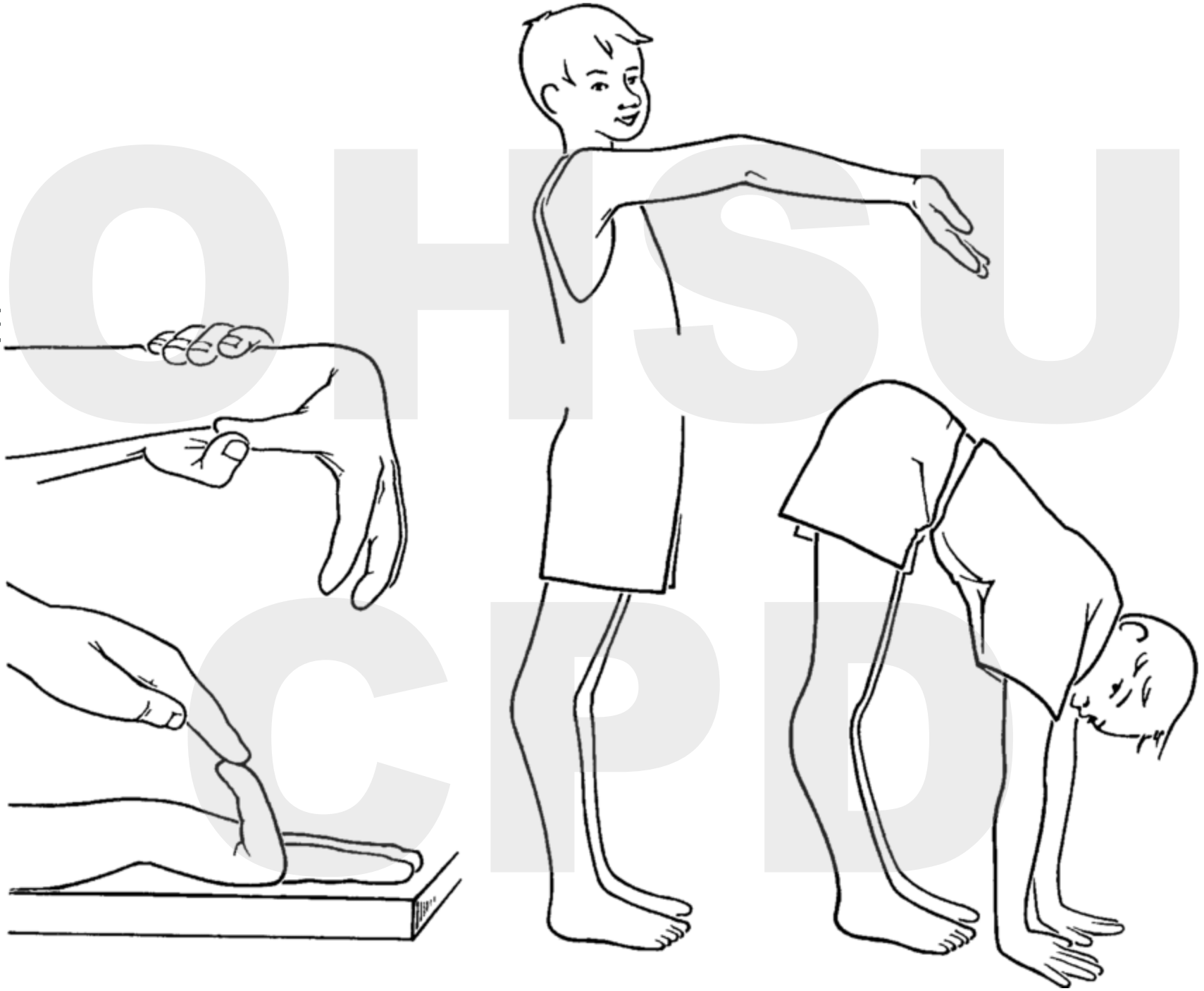

The International Consortium on Ehlers-Danlos Syndromes & Related Disorders
In Association with The Ehlers-Danlos Society

Diagnostic Criteria for Hypermobile Ehlers-Danlos Syndrome (hEDS)

This diagnostic checklist is for doctors across all disciplines to be able to diagnose EDS

Distributed by The Ehlers Danlos Society.

Patient name: _____ DOB: _____ DOV: _____ Evaluator: _____

The clinical diagnosis of hypermobile EDS needs the simultaneous presence of all criteria, 1 ***and*** 2 ***and*** 3.

CRITERION 1 – Generalized Joint Hypermobility

One of the following selected:

- ☐ ≥6 pre-pubertal children and adolescents
- ☐ ≥5 pubertal men* and women* to age 50
- ☐ ≥4 men* and women* over the age of 50

Beighton Score: ____/9

If Beighton Score is one point below age- and sex-specific cut off, two or more of the following must also be selected to meet criterion:

- ☐ Can you now (or could you ever) place your hands flat on the floor without bending your knees?
- ☐ Can you now (or could you ever) bend your thumb to touch your forearm?
- ☐ As a child, did you amuse your friends by contorting your body into strange shapes or could you do the splits?
- ☐ As a child or teenager, did your shoulder or kneecap dislocate on more than one occasion?
- ☐ Do you consider yourself "double jointed"?

CRITERION 2 – Two or more of the following features (A, B, or C) must be present

Feature A (five must be present)

- ☐ Unusually soft or velvety skin
- ☐ Mild skin hyperextensibility
- ☐ Unexplained striae distensae or rubae at the back, groins, thighs, breasts and/or abdomen in adolescents, men or pre-pubertal women without a history of significant gain or loss of body fat or weight
- ☐ Bilateral piezogenic papules of the heel
- ☐ Recurrent or multiple abdominal hernia(s)
- ☐ Atrophic scarring involving at least two sites and without the formation of truly papyraceous and/or hemosideric scars as seen in classical EDS
- ☐ Pelvic floor, rectal, and/or uterine prolapse in children, men or nulliparous women without a history of morbid obesity or other known predisposing medical condition
- ☐ Dental crowding and high or narrow palate
- ☐ Arachnodactyly, as defined in one or more of the following:
  (i) positive wrist sign (Walker sign) on both sides, (ii) positive thumb sign (Steinberg sign) on both sides
- ☐ Arm span-to-height ratio ≥1.05
- ☐ Mitral valve prolapse (MVP) mild or greater based on strict echocardiographic criteria
- ☐ Aortic root dilatation with Z-score >+2

Feature A total: ____/12

Feature B

- ☐ Positive family history; one or more first-degree relatives independently meeting the current criteria for hEDS

Feature C (must have at least one)

- ☐ Musculoskeletal pain in two or more limbs, recurring daily for at least 3 months
- ☐ Chronic, widespread pain for ≥3 months
- ☐ Recurrent joint dislocations or frank joint instability, in the absence of trauma

CRITERION 3 – All of the following prerequisites MUST be met

1. Absence of unusual skin fragility, which should prompt consideration of other types of EDS
2. Exclusion of other heritable and acquired connective tissue disorders, including autoimmune rheumatologic conditions. In patients with an acquired CTD (e.g. Lupus, Rheumatoid Arthritis, etc.), additional diagnosis of hEDS requires meeting both Features A and B of Criterion 2. Feature C of Criterion 2 (chronic pain and/or instability) cannot be counted toward a diagnosis of hEDS in this situation.
3. Exclusion of alternative diagnoses that may also include joint hypermobility by means of hypotonia and/or connective tissue laxity. Alternative diagnoses and diagnostic categories include, but are not limited to, neuromuscular disorders (e.g. Bethlem myopathy), other hereditary disorders of the connective tissue (e.g. other types of EDS, Loeys-Dietz syndrome, Marfan syndrome), and skeletal dysplasias (e.g. osteogenesis imperfecta). Exclusion of these considerations may be based upon history, physical examination, and/or molecular genetic testing, as indicated.

Diagnosis: _____

v9

*Sex assigned at birth. Currently, we do not have data to provide specific additional guidance to individuals on changes in joint hypermobility following treatments that alter sex hormone levels.

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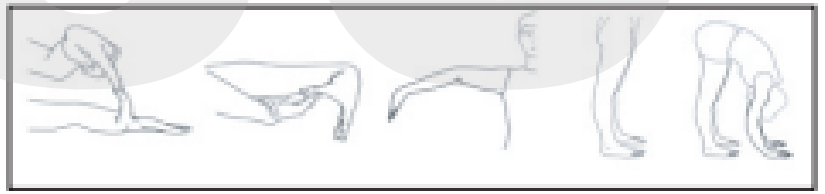

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- Hypermobility syndromes
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General Complaints[2, 6, 7]

- Joint instability
  - Subluxation/dislocation (96.3%)
  - Joint pain (100%)
  - ITB syndrome, snapping
  - TMJ
  - Tendinopathy (25.9%)
- ?Early OA
  - Conflicting data
- ?Reduced bone density
  - Conflicting data

General Complaints[2, 6, 8, 9,10]

- Fatigue, sleep disturbance (84%)
- Headache
- Myofascial pain
- Impaired proprioception
  - Fear of falling/increased incidence of falls (95% of adults with JHS/hEDS)

General Complaints[2, 6, 8, 11]

- Psychiatric issues common (chicken/egg)
- Neuropathic pain without electrodiagnostic findings
  - ?Stretch
- Chronic pain
  - Severity >> expected from imaging
  - Repetitive microtrauma
  - **Combo of central sensitization, impaired proprioception, weakness, kinesiophobia**
  - Psych issues play a role

General Complaints[2, 6, 12]

- Autonomic dysfunction
  - POTS, atypical chest pain
  - 88% dizzy/lightheaded, 40% presyncope, 27% standing intolerance, 43% palpitations, **100% 5+ orthostatic symptoms >6 months**
- Cardiovascular
  - No clear associations/concerns

General Complaints[6, 13]

- GI
  - Functional bowel disorders (up to 67%)
  - GERD, gastritis, delayed emptying
  - Refractory
- OB/gyn
  - Short labor/delivery, PROM, postpartum hemorrhage
  - Pelvic pain
  - Pain during pregnancy
  - Increased dysautonomia during pregnancy

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MSK Complications[26]

- Macrotrauma
  - Dislocation, subluxation, soft tissue injury
  - Damage to muscle, ligament, tendon, synovium, cartilage
  - Leads to acute pain, loss of function, needs acute treatment
- Microtrauma
  - Subtle/silent injury
  - May predispose to persistent or recurrent pain
  - ?OA

Shoulder

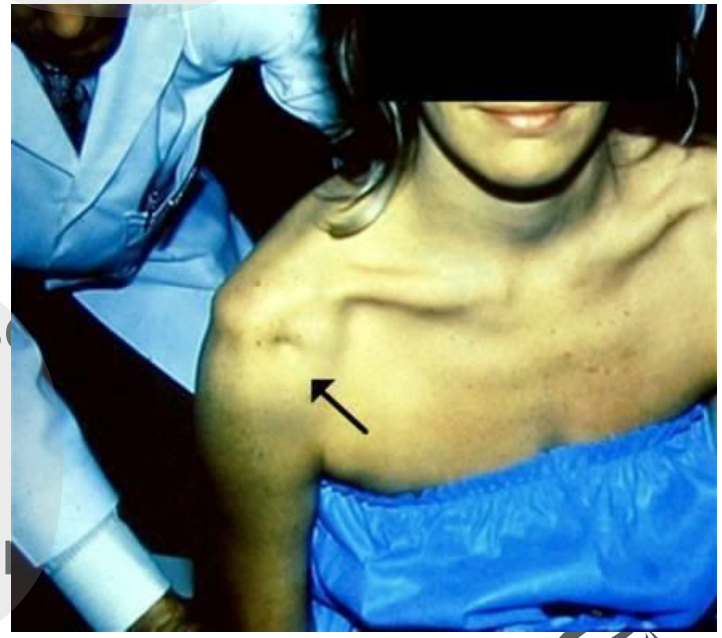
MSK Complications[14]

- **Multidirectional instability
- Reduced proprioception
- Altered neuromuscular control of glenohumeral joint AND scapula
- ****Poor dynamic control** -> increased translation
  - Inferior instability with abduction

Shoulder

MSK Complications[14]

- Primary direction of instability common
- Diagnosis
  - Sulcus sign
  - Rule out cervical pathology
- Management
  - PT, but poor evidence
    - Rockwood (old), Derby (too intense), Watso program
  - Surgery: goal to reduce capsular volume
    - Inferior capsular shift and capsular plicatio
    - Thermal capsulorrhaphy (worst)



Hand/Wrist

MSK Complications[15]

- Laxity at CMC -> ?OA
- Notable for:
  - Trapeziometacarpal arthritis (16%)
  - Sublux (66%)
  - Dislocation (29%)
- Not as commonly involved as other joints

Hip

MSK Complications[16, 17, 18]

- Greater trochanteric pain syndrome
  - Likely due to IT band dysfunction
- Impingement common
- Extreme ROM -> FAI without pincer/cam
  - Microinstability exacerbates
- Mainstay: PT
- Surgical:
  - Plication, labral repair/debridement, femoral resections, psoas tenotomies

Knee

MSK Complications[15]

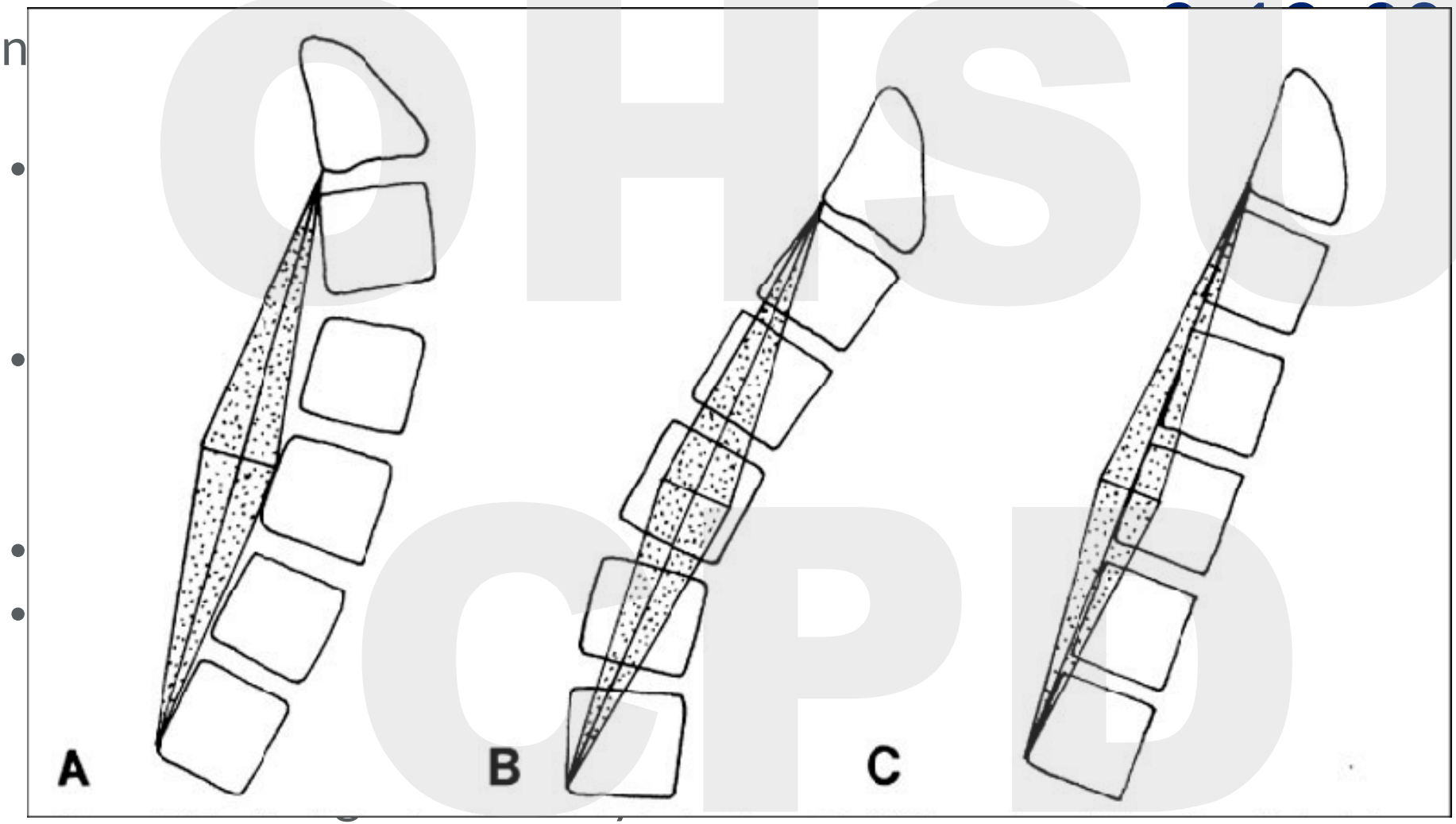
- Associated with ACL injury
  - Knee hyperextension -> 5x greater risk than matched controls
  - Laxity remains after ACL repair
- Rarely radiographic changes
- **Poorly associated with OA**
- Patients still very commonly complain of pain
- Mainstay: PT

Ankle

MSK Complications[15]

- Midfoot laxity in ~93%
- Up to 2x risk of sprain
  - Midfoot collapse in gait -> instability -> strain
- Mainstay: PT
- Surgery: consider autograft or allograft for stabilization

Spin



Spine

MSK Complications[9, 19, 20]

- Lumbar spine
  - Less associated
- Increased compression fractures in EDS (classical and hEDS)
  - Similar DEXA findings with control
- Treatment for all of spine:
  - PT for stability, positioning
  - Bracing as needed
  - Trigger avoidance
  - Surgery: for AAI and myelopathy/radiculopathy, but unknown adjacent level disease occurrence

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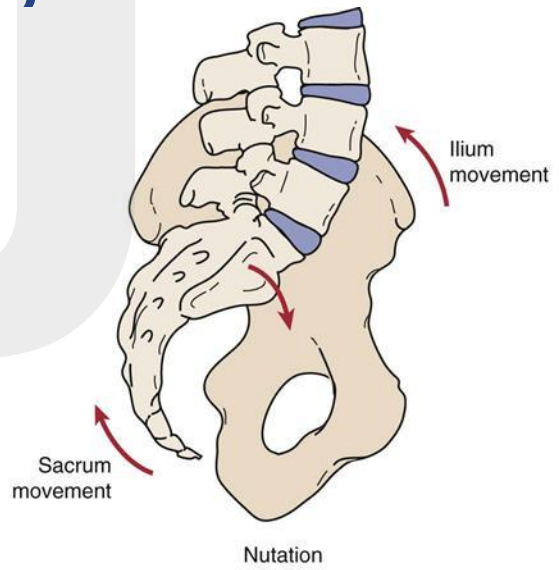
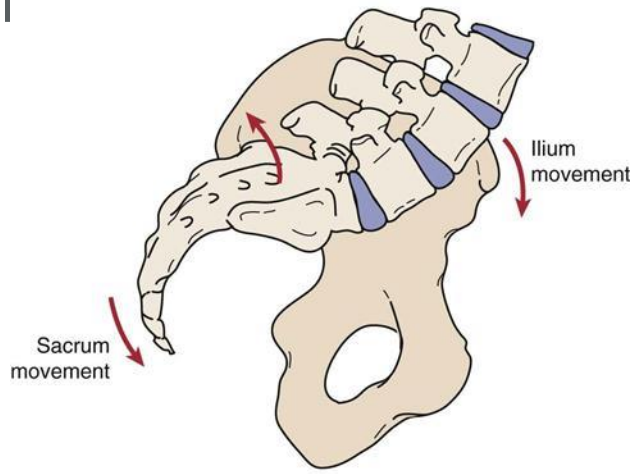
Sacroiliac

MSK Complications[21, 22]

- Imbalance/asymmetry -> pain
  - With motion only
- Increased laxity in pregnancy
  - Consider bracing
- Treatment
  - Manipulation/modalities, strengthening, motor control
  - Correct adaptive changes
  - Establish HEP
  - Prolotherapy? Steroids?



Nutation



Counternutation

Headache

MSK Complications[23]

- Multifactorial
  - Migraine, mixed chronic headache most common
    - Intracranial and peripheral vessel involvement
    - Dysautonomia
  - Cervical MSK issues (overuse, facet)
  - TMJ
  - ?CSF leak
  - Chiari 1 malformation
  - Injury susceptibility
- Treatment: investigate and pursue source; single treatment failure common

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General Treatment Principles[6, 10, 24]

- PT is essential
  - Modalities
  - Alexander technique
  - Low resistance, graduated increase
  - Closed chain; avoid open chain
  - Can use hypermobility
  - Proprioception/balance work
  - Pelvic floor therapy
- Exercise
  - Low evidence, unclear what kind is best
  - Appears to help

PT perspective

- **Isometrics** to strengthen without putting pressure on joints
- Mirror feedback for **posture and training of body awareness** (often these patients use compensatory strategies to stand, walk, etc that actually lead to more pain and damage – one example is standing with locked knees)
- Mirror and therapist feedback during basic movement patterns (getting out of chair, reaching for something) to demonstrate potentially damaging habits. We use something called **Alexander Technique**, but also just teach **core stability and concepts of posture**)
- **Core stability** exercises that do not put pressure on joints (swiss ball activities, yoga, tai chi)
- **Positioning** interventions (supportive pillows for sleep, lumbar support when sitting, ergonomics, etc)
- **Pacing concepts**, listening to the body, **flare management** and developing of a plan for when pain is higher than baseline
- **Coping strategies** surrounding the management of chronic conditions, acceptance, active versus passive coping, meditation and relaxation (often these patient have some weak, and some excessively tight muscles)

Megan Driscoll

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General Treatment Principles[6, 10, 24]

- Bracing prn
- Medication – think layers
  - NSAIDs/COX-2, topicals, muscle relaxers, neuropathics
  - Magnesium oral/topical for spasm
  - Opioids last resort
- Injections
  - Corticosteroid, glucosamine/hyaluronic acid, prolotherapy
  - ?Sclerotic agents
- Surgery – expect mixed results
- Autonomic dysfunction
  - Greatly increase H2O and salt intake
  - LE strengthening, behavioral modification
  - Fludricortisone, midodrine

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Take Home Points[25]

- Psychiatric, neurologic, autonomic, AND musculoskeletal
- High impact on HRQoL
- High likelihood of seeking care
- High utilization, high medication use
- **Pain rarely improves greatly**
  - **Function sees the gains**
- Recognition is key
- Multidisciplinary team is essential for long term management

Questions?

Thank You!

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