What to do when you suspect Ehlers-Danlos Syndrome (EDS)

A Practical Guide

Mountain States
REGIONAL GENETICS NETWORK

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Introduction

Joint hypermobility syndrome/Hypermobile Ehlers–Danlos syndrome (JHS/hEDS) represents a multi-faceted disorder frequently encountered in the primary care setting. Hypermobile Ehlers-Danlos syndrome (hEDS) is also known as the hypermobility type or type 3 EDS.

Generalized joint hypermobility (GJH) commonly occurs without the other necessary features of JHS/hEDS. GJH is estimated to affect 10 to 20% of the general population, although a wide variation exists. Many individuals with GJH are asymptomatic. GJH diminishes with age and is about three times more common in females than males.

JHS/hEDS is by far the most common among the currently 14 types of EDS and international diagnostic criteria have been proposed, most recently in 2017 (Malfait et al. 2017). Many patients with mild to moderate hypermobility can be diagnosed and treated by the primary care provider. Referral for specialist consultation may be considered in certain cases.

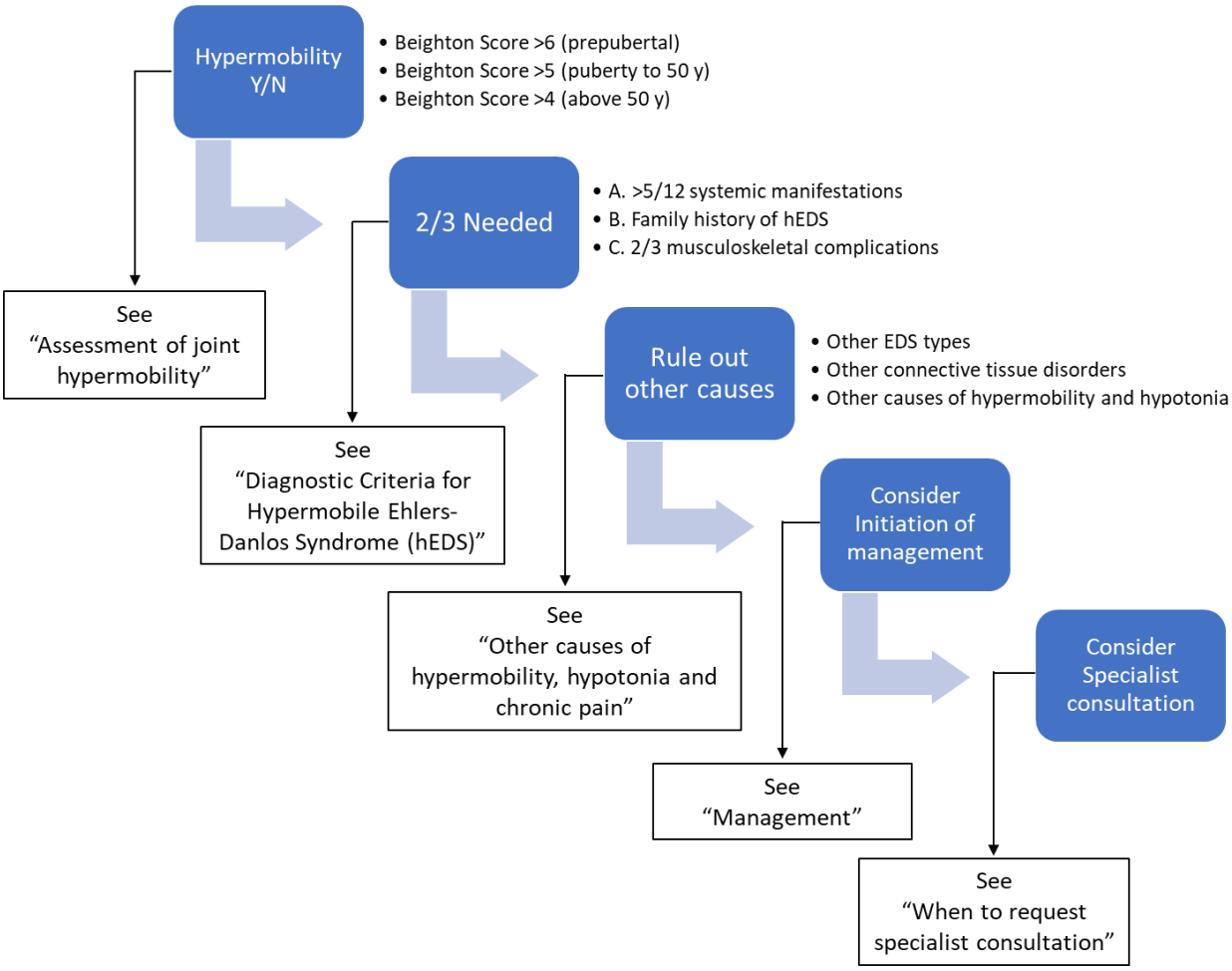
This document is intended to assist the primary care provider in diagnosing JHS/hEDS and determining whether to request a consultation for evaluation for a connective tissue disorder, specifically the Ehlers-Danlos Syndromes. It also includes recommendations for interventions and evaluations that may be helpful to implement prior to the genetics consultation. Hopefully, this document will also help clarify the scope and role of the primary care provider in diagnosis and management of JHS/hEDS.

Genetic testing

There is currently no genetic test available for hEDS, and the diagnosis is made clinically. Genetic testing is available for 13 of the 14 types of EDS. This number is expected to increase with the discovery of new gene-disease associations to be added to the EDS classification. Genetic testing will be recommended if indicated due to findings on physical exam, medical history, or family history. It is recommended that genetic counseling is provided if testing is pursued.

Algorithm for diagnosis, management, and referral

This algorithm serves as a quick reference on how to approach JHS/hEDS. Each step (blue boxes) links to a more detailed description in this guide (rectangles). It is based on the 2017 diagnostic criteria for JHS/hEDS (Malfait et al. 2017).

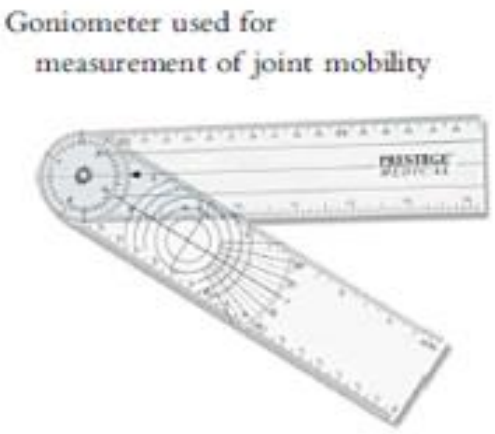


Assessment of joint hypermobility

Adults and adolescents

Hypermobility in JHS/hEDS is generalized, i.e. affecting proximal/large and distal/small joints. In contrast, hypermobility in vascular EDS, but also neuromuscular disorders typically affect predominantly distal/small joints. It is important to know that while the Beighton Scoring System is helpful to quantify the degree of hypermobility, it is limited by its lack of inclusion of large joints such as the shoulders and hips, as well as ankles and the jaw.

Hypermobility is best assessed using a goniometer according to the Beighton Scoring system:



The Beighton Scoring System:

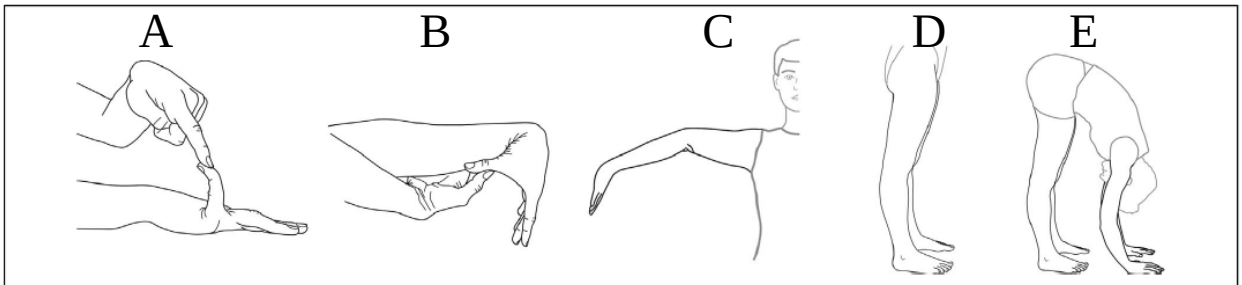


Figure 2. The Beighton scoring system. Each joint is measured using a goniometer and each side is scored independently as outlined [Juul-Kristensen et al., 2007]. (**A**) With the palm of the hand and forearm resting on a flat surface with the elbow flexed at 90°, if the metacarpal-phalangeal joint of the fifth finger can be hyperextended more than 90° with respect to the dorsum of the hand, it is considered positive, scoring 1 point. (**B**) With arms outstretched forward but hand pronated, if the thumb can be passively moved to touch the ipsilateral forearm it is considered positive scoring 1 point. (**C**) With the arms outstretched to the side and hand supine, if the elbow extends more than 10°, it is considered positive scoring 1 point. (**D**) While standing, with knees locked in genu recurvatum, if the knee extends more than 10°, it is considered positive scoring 1 point. (**E**) With knees locked straight and feet together, if the patient can bend forward to place the total palm of both hands flat on the floor just in front of the feet, it is considered positive scoring 1 point. The total possible score is 9. *Figure courtesy of Dr. Juul-Kirstensen.*

(modified from Malfait et al. 2017)

Children

The Beighton score is also a valid measure for generalized hypermobility in children (Smits-Engelsman et al. 2011).

Modified Beighton score for children younger than the age of 4 years

Very young children often have difficulties to perform (E) as depicted in the figure above. This item can be replaced with the evaluation of passive dorsiflexion of the ankle joint bilaterally, which was found to be suitable to perform in this age group and has been used previously in other studies for children at various ages (Romeo et al. 2016). Young children tend to be more mobile than teenagers and adults. Hypotonia can also be confused with joint hypermobility.

Diagnosis of Joint hypermobility syndrome/Hypermobile Ehlers–Danlos syndrome (JHS/hEDS)

The diagnosis of JHS/hEDS remains clinical. No causative gene has been identified and there is no genetic testing available for JHS/hEDS. There is a clinical spectrum ranging from asymptomatic joint hypermobility not necessarily requiring a diagnosis, through "non-syndromic" hypermobility with secondary manifestations which may be referred to as joint hypermobility syndrome (JHT), to hypermobile EDS (hEDS). Hypermobile EDS (hEDS is also known as EDS hypermobile type or EDS type 3. A diagnosis of hEDS should be assigned only in those who meet all the criteria (see below). Hypermobile EDS is inherited in an autosomal dominant pattern and other family members are frequently affected.

Several aspects that distinguish JHS/hEDS from other types of EDS are worth highlighting. As mentioned before, the genetic cause(s) of JHS/hEDS remain(s) to be elucidated and no genetic testing is available for JHS/hEDS. In contrast, EDS types other than JHS/hEDS are increasingly classified according to the corresponding causative gene and genetic testing is part of their diagnosis. While in JHS/hEDS the defining feature is mild-to-moderate generalized joint hypermobility, EDS types other than JHS/hEDS feature prominent and often quite specific involvement of other organ systems. Examples include severe skin hyperextensibility and atrophic scarring in classic EDS; tissue fragility and hollow organ and arterial rupture in vascular EDS; severe generalized joint hypermobility with multiple dislocations/subluxations and skin hyperextensibility in arthrochalasia EDS; and congenital muscle hypotonia and congenital or early onset kyphoscoliosis in kyphoscoliotic EDS.

Clinical heterogeneity of JHS/hEDS

There is a broad spectrum of severity with respect to the impact of symptoms on overall health and quality of life in these conditions. Many refer to hEDS as a benign condition. However, while hEDS may not include life threatening risks, the impact and limitations on activities of daily living is not benign.

Etiological heterogeneity of hypermobility

The question of whether to refer requires consideration of a spectrum of etiologically heterogeneous conditions that may also present with joint hypermobility and/or other features shared with JHS/hEDS. Among those are other heritable connective tissue disorders including other forms of EDS, neuromuscular conditions, skeletal dysplasias, chronic pain syndromes, autoimmune rheumatologic conditions, or allergic/immunological conditions. The combination of joint hypermobility plus skin findings (generally mild findings such as stretchy skin, easy

bruising and stretch marks) is a helpful indicator of hEDS. Conversely, predominant and severe skin findings would be more suggestive of other EDS types such as classic or vascular EDS and should prompt consideration for specialist referral.

Limitation of hypermobility as a clinical diagnostic criterion

Generalized joint hypermobility frequently prompts consideration of a heritable connective tissue disorder. However, hypermobility might not always be the presenting sign, and may be mild or even absent in several important differential diagnoses of JHS/hEDS including vascular EDS and Marfan syndrome. In vascular EDS (vEDS) hypermobility is not generalized, but typically limited to the distal/small joints and is not usually associated with dislocations or subluxations of large joints. In addition, distal/small joint hypermobility represents only a minor diagnostic criterion of vEDS and might be entirely absent. Similarly, joint hypermobility is not part of the systemic score in the revised Ghent criteria for Marfan syndrome. In contrast, a positive wrist and thumb sign in patients with Marfan syndrome may reflect dolichostenomelia (long limbs) rather than hyperextensibility of joints and ligaments and may be associated with reduced extensibility in the elbow, a criterion in the systemic Marfan score. Lastly, the Beighton scale may be misleadingly low in a patient with hypermobility affecting mostly large joints.

Diagnostic Criteria for Hypermobile Ehlers-Danlos Syndrome (hEDS)

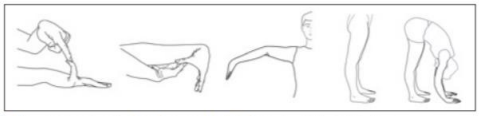
The clinical diagnosis of hEDS needs the simultaneous presence of criteria 1 and 2 and 3 summarized in the table on the next page. Please see the diagnostic checklist accessible on the website of the EDS Society (https://ehlers-danlos.com/wp-content/uploads/hEDS-Dx-Criteria-checklist-1.pdf).

CRITERION 1 – Generalized Joint Hypermobility

One of the following selected:

- ☐ ≥6 pre-pubertal children and adolescents
- ☐ ≥5 pubertal men and woman 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.

There is a range of conditions which can accompany hEDS, although there is not enough data for them to become diagnostic criteria. While they are associated with hEDS, they are not proven to be the result of hEDS and they are not specific enough to be criteria for diagnosis. Some of these include sleep disturbance, fatigue, postural orthostatic tachycardia, functional gastrointestinal disorders, dysautonomia, anxiety, and depression. These conditions may be more debilitating than the joint symptoms; they often impair daily life, and they should be considered and treated. Confusingly, there can be an association between autoimmune disorders and hEDS; therefore, a diagnosis of an autoimmune rheumatologic disorder may not completely exclude the diagnosis of a connective tissue disorder.

Other causes of hypermobility, hypotonia, and chronic pain

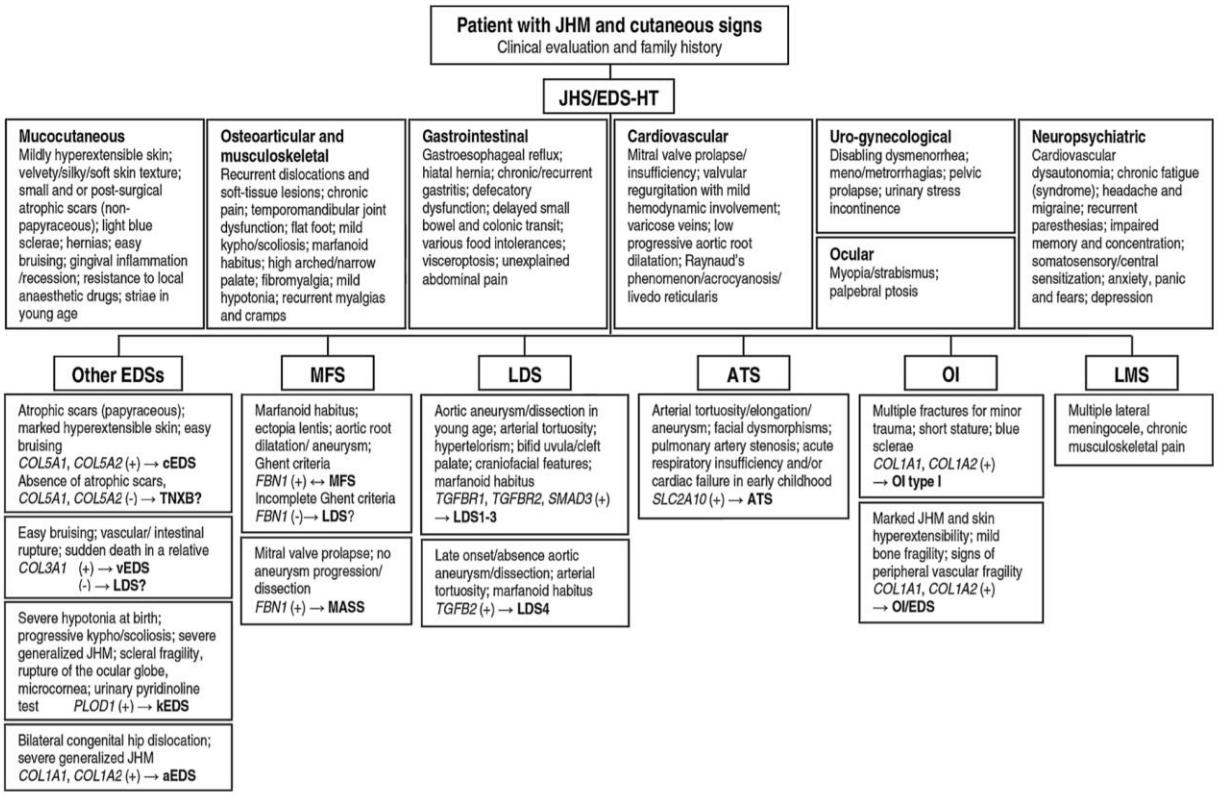
Recognizing conditions with increased risk of vascular complications

An important and perhaps the most challenging question the primary care provider must answer in some cases is whether a genetic syndrome with risk of vascular complications must be considered which would prompt referral for consultation. This includes vascular EDS, Marfan syndrome or the related group of Loeys-Dietz syndrome or homocystinuria, for example. Thus, it helps to be familiar with the manifestations and diagnostic criteria of these conditions:

- Overview: https://www.marfan.org/dx/related
- Vascular EDS: https://www.ehlers-danlos.com/pdf/2017-FINAL-AJMG-PDFs/Byers_et_al-2017-American_Journal_of_Medical_Genetics_Part_C-_Seminars_in_Medical_Genetics.pdf
- Marfan syndrome: https://www.marfan.org/dx/rules
- Loeys-Dietz syndrome: https://www.ncbi.nlm.nih.gov/books/NBK1133/
- Homocystinuria: https://www.ncbi.nlm.nih.gov/books/NBK1524/
- For a comparison chart of heritable connective tissue disorders with risk of vascular complications: https://www.marfan.org/dx/related

Diagnostic flowchart for generalized joint hypermobility and the most commonly encountered conditions (Colombi et al. 2015)

(Legend on the next page).



Non-connective tissue disorders with presentations that overlap with JHS/hEDS

Generalized hypermobility can be a feature of several groups of disorders involving systems other than connective tissue. Below is a brief list of possible considerations. If present, specialist referral may be appropriate.

Neuromuscular and myopathic disorders

Several primary myopathies may feature joint hypermobility and skin changes and are thus important differential diagnoses. Examples include: Collagen VI-related dystrophies and myopathies, Collagen XII related myopathy/EDS overlap syndrome, RYR1 and SEPN1 related myopathies, and Multiminicore and Central core disease. Compared to heritable connective tissue disorders, congenital myopathies more often show distal rather than generalized hypermobility (distal and proximal interphalangeal and metacarpophalangeal joints of hands, distal interphalangeal joints of feet, wrists, and ankles), and are frequently accompanied by congenital hip dislocation (especially in COL6 and RYR1 related conditions). COL6 related dystrophies have prominent and progressive joint contractures, typically occurring in the shoulders, elbows, hips, knees, and Achilles tendons, but also in the finger flexors. Thus, there can be evidence of joint hypermobility as well as contractures in the hands and fingers.

Gastrointestinal disorders

Functional GI disorders are common in JHS/hEDS and may include GERD, delayed gastric emptying and irritable bowel syndrome. Fibromyalgia and chronic fatigue syndrome may present with overlapping GI symptoms. On the other hand, Celiac disease may coexist with EDS or be misdiagnosed as EDS. Common features may include pain, fatigue, functional gastrointestinal disorders, and cardiovascular autonomic dysfunction. In younger patients, chronic abdominal pain, feeding intolerance, poor growth, and severe constipation may be the presenting complaint and may warrant a pediatric gastrointestinal evaluation. Multiple food allergies leading to eosinophilic gastrointestinal disease is another common associated problem in pediatric patients.

Allergy/Immunology

Mast cell activation disorder is thought to be associated with some of the systemic symptoms in EDS. Laboratory tests such as serum tryptase levels and N-methyl histamine in urine are notoriously insensitive and should be ordered and interpreted by a specialist familiar with the condition. It needs to be differentiated from mastocytosis, which requires biopsy evidence. In addition to chronic hives and rashes, mast cell disease can also involve the GI tract as well as the bladder.

Chronic pain and headache

Chronic pain unrelated to joint dislocation is common in JHS/hEDS and there may be overlap with fibromyalgia and/or chronic fatigue syndrome. However, most patients with fibromyalgia and/or chronic fatigue syndrome do not have JHS/hEDS. Similarly, chronic headaches including migraine and tension headaches are common in hEDS. Limited evidence suggests that Chiari I malformation and occipitoatlantoaxial instability may be more frequent in patients with a

hereditary connective tissue disorder, including many with hEDS although the clinical relevance of this potential association is uncertain. Patients with occipital or postural/orthostatic headache, and/or additional unexplained neurological symptoms, such as upper limb paresthesias and weakness should undergo neurological evaluation and imaging for possible cerebellar tonsils herniation and occult occipitoatlantoaxial instability. Involvement of a neurologist specializing in headache management may be indicated. Sometimes patients self-medicate with overuse of pain medications and marijuana where legal. Use of CBD in pediatric patients is problematic. Referral for a formal pain team consultation may be warranted.

Management

Recommended evaluations and interventions

- **Echocardiogram** to evaluate the structure and function of the heart including the valves (mitral valve prolapse) as well as aortic root dimension (aortic root dilation).
- **Ophthalmology exam** to detect abnormalities associated with connective tissue disorders.
- **Orthotics** if the child has pes planus with ankle pronation. This will help to realign ankles, feet, knees, and hips and may improve complaints of lower extremity pain and fatigue.
- **Physical therapy** if the child has joint hypermobility, history of dislocations/subluxations, and/or joint pain. The goal is to increase muscle strength to stabilize joints as well as improving overall physical conditioning. Physical therapy on a regular basis is a mainstay of pain intervention.
- **Occupational therapy** for complaints of pain and fatigue in hands affecting handwriting or other activities of daily living.
- **Modification of school program** including a 504 plan is an important recommendation for school-aged patients. This can include use of computers, shorter writing assignments, freedom to drink more in school, use the restroom when needed, and giving more time to complete tests and assignments.

Targeted evaluations and interventions

POTS (postural orthostatic tachycardia syndrome). Many patients with joint hypermobility and EDS also have autonomic dysfunction altering the regulation of the involuntary nervous system that is made worse by decreased physical activity and overall physical deconditioning. Associated symptoms include dizziness, tachycardia, syncope, headache, nausea, digestive issues, foggy thinking, and anxiety.

- **Orthostatic Vital Signs.**
    - For teenagers, the criteria for this diagnosis is met if the heart rate increases by 40 beats per minute after changing positions from lying to sitting to standing.
    - The patient should be lying for at least 10 minutes before checking BP and HR. Wait two minutes after a position change from lying to sitting and from sitting to standing to check BP and HR for most accurate results.

- **Increase water intake and intake of salty snacks.** Fluid intake of 1 ½-2 L per day and extra salt in the form of salt tablets or other salt additives may be required. Further management, including the need for medications or intravenous fluid administration requiring central line placement, should be guided by a specialist knowledgeable in dysautonomia management.
- **Physical therapy** with a physical therapist familiar with joint hypermobility and POTS**.**
    - **The Levine Protocol** is recommended for a slow, gradual increase in physical activity to improve conditioning (link included below).

GI consultation. If abdominal pain, nausea, bloating, constipation, or other symptoms are affecting the child's ability to eat and drink normally and contributing to symptoms of dizziness, headaches, and other symptoms of POTS. Failure to thrive may be a problem in more severe cases, as are symptoms of GERD. Multiple food allergies are commonly seen in patients with connective tissue disorders and may warrant an evaluation for Eosinophilic Esophagitis.

Urologic consultation. If functional urologic symptoms are present, including frequency, urgency, and enuresis not associated with a urinary tract infection, a urologic consultation might be warranted. Also, may consider referral to a physical therapist knowledgeable about pelvic floor issues and exercises.

Psychotherapy. It is estimated that 70% of patients with joint hypermobility and joint pain have an anxiety disorder. There is a strong "neuroconnective" phenotype that requires a multidimensional approach to care. This aspect of care cannot be ignored and initiating therapy as early as possible is recommended.

Multidisciplinary pain clinic. If pain is limiting participation in normal activities of daily life such as school and social activities. Ideally this will include physical therapy and psychotherapy as part of the multidisciplinary clinic.

Physiatry/physical medicine and rehabilitation (PM&R). Medical management of complex patients is ideally overseen by a physician specializing in physiatry/physical medicine and rehabilitation (PM&R).

Sleep evaluation. If the child is having trouble falling or staying asleep and is chronically fatigued. Poor sleep and fatigue are associated with increased pain and anxiety, and poor sleep hygiene is often the biggest contributing factor. Low iron stores (ferritin) are common and repleting iron may help some of the symptoms. The optimal ferritin level is 50.

Allergy/Immunology evaluation. For mast cell activation syndrome (MCAS) if the child has unexplained rashes, hives, or symptoms of anaphylaxis with unknown etiology. Mast cell infiltration can also cause symptoms that mimic GERD, and are often difficult to distinguish from the GI manifestations of EDS. MCAS may also involve the bladder and cause symptoms which may mimic recurrent UTIs. The diagnosis of MCAS is difficult to make and may warrant more formal testing by an immunologist or urologist with expertise in patients with EDS.

When to request specialist consultation

The following guidelines may help to decide whether specialist consultation for diagnosis/management is the best initial step:

If the patient meets diagnostic criteria for JHS/hEDS and presents with mild to moderate symptoms, diagnosis and management can be through the primary care provider as outlined above. If the provider is not comfortable in assessing joint hypermobility using the Beighton scoring system a physical or occupational therapist may be helpful in performing this assessment and determining if the patient might benefit from therapy.

If a patient presents with severe symptoms (e.g. multiple recurrent dislocations, severe skin manifestations, etc.), with or without additional features suggesting possible other causes of hypermobility, specialist consultation might be considered.

Guide for requesting specialist consultation.

Hypermobility PLUS additional features suggesting possible	Consider consultation with
Genetic syndrome with increased risk of vascular complication	Medical Genetics
EDS other than JHS/hEDS	Medical Genetics
Chronic pain	Pain clinic and physical therapy
Non-connective tissue disorder	
• Neurologic/Neuromuscular	Neurology
• Gastrointestinal	Gastroenterology
• Autoimmune/Rheumatological	Rheumatology
• Allergy	Allergy/Immunology
• Functional Urologic disorders	Urology
• Structural heart defect and/or dysautonomia	Cardiology or Dysautonomia Specialist

Clinical features that might prompt consideration of specialist consultations

Body system	Clinical features
Musculoskeletal	Severe generalized joint hypermobility with recurrent dislocation of multiple joints
	Progressive scoliosis or kyphoscoliosis in combination with joint hypermobility
	Chronic joint or muscle pain
Cutaneous	Hyperextensible and velvety soft texture skin beyond infancy
	Poor wound healing or extremely fragile skin
	Thin/translucent skin with prominent veins
	Bruising beyond what is expected in childhood
	Atrophic scarring (“cigarette paper-like scars”)
Ophthalmological	Blue or grayish sclera beyond infancy
	Retinal fragility
	Severe myopia
	Lens subluxation/dislocation
Cardiovascular	Mitral Valve Prolapse (with or without regurgitation)
	Aortic Root Dilation
	Arterial tortuosity
	Arterial aneurysms
	Arterial dissections
Gastrointestinal	Intestinal rupture
	Severe constipation
	Feeding disorder with failure to thrive
	Rectal prolapse
	Severe dysphagia or motility dysfunction
Urological	Frequency, urgency (not associated with urinary tract infection)
	Enuresis
Gynecological	Uterine rupture
	Heavy menstrual bleeding
Family history	Confirmed diagnosis of EDS other than JHS/hEDS or another connective tissue disorder
	Family history of aneurysms or rupture of arteries or hollow organs (uterus, bowel)

References & Resources for Clinicians

The Ehlers-Danlos Society website (https://www.ehlers-danlos.com/) provides comprehensive information regarding the 14 subtypes of EDS as well as information on important aspects of care for these individuals.

- 2017 EDS Classification for Non-Experts
    - https://www.ehlers-danlos.com/2017-eds-classification-non-experts/
- Diagnostic criteria for clinical diagnosis of hEDS
    - https://ehlers-danlos.com/wp-content/uploads/hEDS-Dx-Criteria-checklist-1.pdf

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Levine Protocol – Instructions for POTS Exercise Program https://www.dysautonomiainternational.org/pdf/CHOP_Modified_Dallas_POTS_Exercise_Program.pdf

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Resources for Patients and Families

Cardiovascular Autonomic Dysfunction in Ehlers-Danlos Syndrome — Hypermobile Type FOR NON-EXPERTS
https://www.ehlers-danlos.com/pdf/2017-Criteria-Nonexpert-PDFs/Cardiovascular-Autonomic-Dysfunction-in-hEDS-Nonexpert-S.pdf

Caring for Someone with EDS or HSD
https://www.ehlers-danlos.com/caring-for-someone-with-eds/

Chronic Fatigue in Ehlers-Danlos Syndrome Hypermobile Type and Hypermobility Spectrum Disorder FOR NON-EXPERTS
https://www.ehlers-danlos.com/pdf/2017-Criteria-Nonexpert-PDFs/Chronic-Fatigue-in-hEDS-HSD-Nonexpert-2019-12c.pdf

EDS Registry- https://www.ehlers-danlos.com/eds-global-registry/

Educator's/Parent's Guide to School Success:
https://ehlers-danlos.com/wp-content/uploads/Educator-Parent-Guide-2016.pdf

Evidence-Based Rationale for Physical Therapy Treatment of Children, Adolescents, and Adults Diagnosed With Joint Hypermobility Syndrome/Hypermobile Ehlers-Danlos Syndrome FOR NON-EXPERTS
https://www.ehlers-danlos.com/pdf/2017-Criteria-Nonexpert-PDFs/Evidence-Based-Rationale-for-Physical-Therapy-Treatment-for-JHS:hEDS-S.pdf

Gastrointestinal Involvement in the Ehlers-Danlos Syndromes FOR NON-EXPERTS
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