

Upper Cervical Instability Assessment Forms Chalela & Russek, 2024

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The figure and tables in this document are from the following articles:

- Chalela S, Russek L. Presentation and physical therapy management using a neuroplasticity approach for patients with hypermobility-related upper cervical instability: a brief report. *Frontiers in Neurology*. 2024;15doi:10.3389/fneur.2024.1459115.
 - Available at:
<https://www.frontiersin.org/journals/neurology/articles/10.3389/fneur.2024.1459115/full>
- Russek LN, Block NP, Byrne E, et al. Presentation and physical therapy management of upper cervical instability in patients with symptomatic generalized joint hypermobility: International expert consensus recommendations. *Front Med (Lausanne)*. 2023;9:1072764. doi:10.3389/fmed.2023.1072764
 - Available at:
<https://www.frontiersin.org/journals/medicine/articles/10.3389/fmed.2022.1072764/full>

Other helpful resources:

- Flex-ability physio has an independent website about UCI in HSD, based in part on the 2023 publication, at: <https://www.flexabilityphysio.com.au/apaignite2023uciresources>
- Many of these assessment techniques are demonstrated on the following website created by Flex-ability physio:
<https://www.youtube.com/playlist?list=PLKBimuL9ff9g0TFaaNQZ4Yh7rTgR97SPk>
- A useful patient resource for UCI in HSD, created by Chronic Pain Partners, is available at: <https://www.chronicpainpartners.com/wp-content/uploads/2023/05/9YyQ9C-Cervical-Spine-Instability-Ebook-copy.pdf>
- Prof. Russek has a patient education lecture on UCI in HSD at: <https://webspace.clarkson.edu/~lrussek/hsd.html> (see HSD 111: Cervical Instability)

Figure 1. Flow Chart for Diagnostic Assessment of Patients with Symptomatic Joint Hypermobility and Suspected Upper Cervical Instability

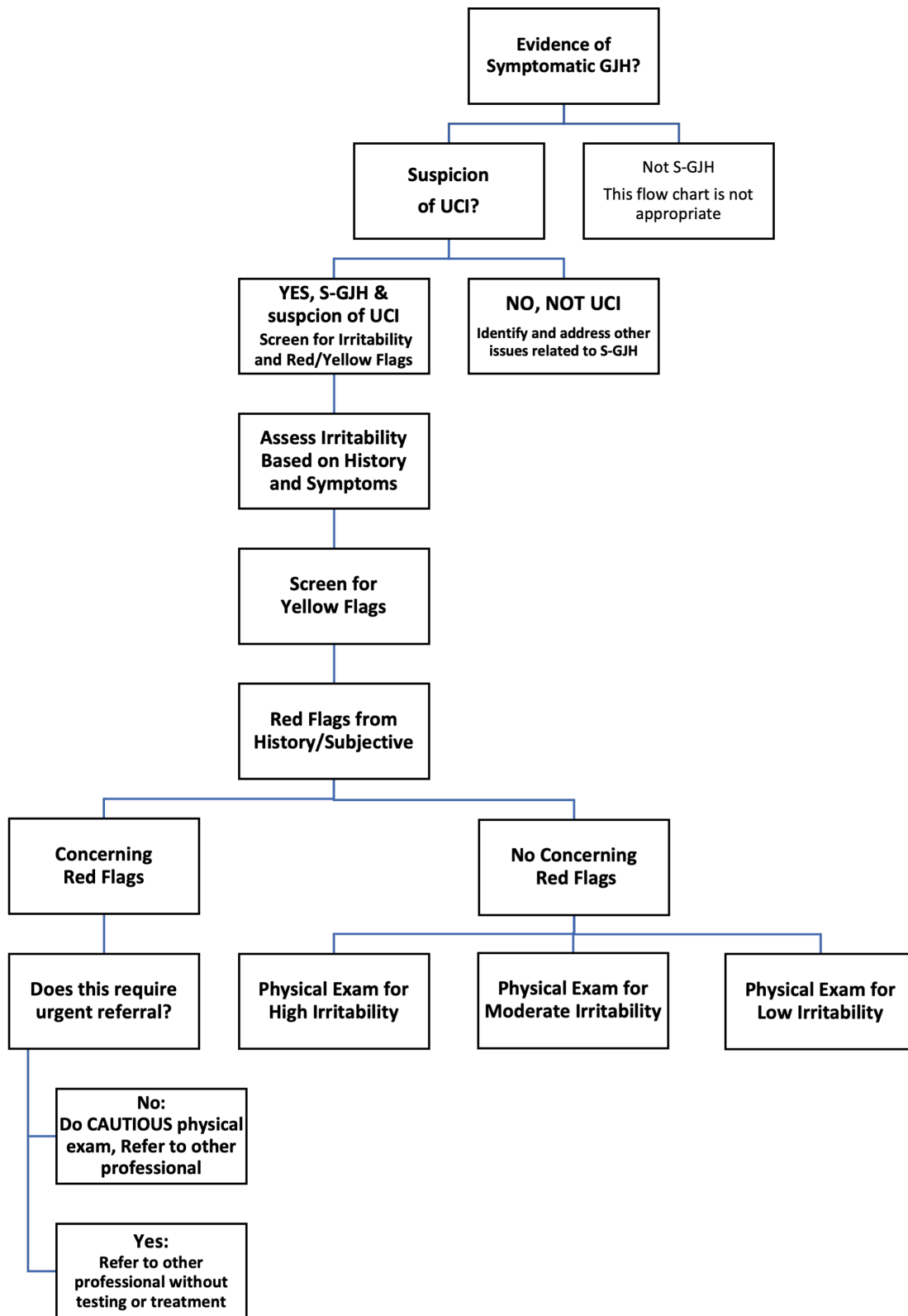


Figure from Chalela S, Russek L. Presentation and physical therapy management using a neuroplasticity approach for patients with hypermobility-related upper cervical instability: a brief report. *Frontiers in Neurology*. 2024;15doi:10.3389/fneur.2024.1459115.

Table 1. Suspicion of Upper Cervical Instability Symptoms and History

	C/S*	
Musculoskeletal UCI		
Heavy/bobble head, patient feels like they need to support or brace their head to decrease symptoms	S	
Apprehension about initiation or maintenance of neck movement or travel in vehicle	S	
Lump in throat, trouble swallowing	S	
Consistent clicking or clunking in the neck associated with neck movement	S	
Cervical sensorimotor symptoms such as tinnitus, dizziness	S	
Suboccipital headaches	C	
Yoke/coat-hanger distribution pain	C	
Neck tension, muscle spasm	C	
Brain fog	C	
Inconsistent or poor response to treatment for the neck	C	
Sleep disturbance, snoring, sleep apnea	C	
Neurological UCI		
Lump in throat, choking, trouble swallowing, voice changes	S	
Symptoms of dysautonomia (especially if not responding to standard treatment), persistent anxiety, functional GI dysfunction, poor temperature regulation, heat intolerance, presyncope	S/C	
“Boat rocking” instability (not due to musculoskeletal issues)	S	
Ataxia: Poor coordination (not due to joint instability)	S	
Facial tingling/numbness	S	
Pulling sensation in face, head, teeth, tongue (muscle contraction, not just pain)	S	
Vision changes-trouble with convergence, double vision, aura (teichopsia)	S	
Dystonia: Involuntary muscle contractions causing involuntary movements or postures	S	
Intermittent dysesthesias in the limbs, not associated with local issues	S	
Sleep disturbance, snoring, sleep apnea	C	
<i>Report of seizure-like activity, dx of “non-epileptic” or “pseudo seizures”^{†‡}</i>	S	
<i>Drop attacks not associated with dysautonomia (e.g., provoked by neck motion, or without dizziness common in POTS)[‡]</i>	S	
<i>Severe or frequent changes in cognitive status[‡]</i>	S	
<i>Rapidly progressing neurological signs with decreasing functional status[‡]</i>		
<i>Increased bowel/bladder control dysfunction[‡]</i>		
<i>Headache worse with coughing, sneezing, bowel movement (Valsalva)[‡]</i>		
<i>Need to use a walker or wheelchair due to moderate or intermittently severe problems with coordination and balance rather than pain or weakness[‡]</i>		

* S=Highly Suggestive finding for UCI (high specificity based on expert consensus).

C=Common finding in UCI (high sensitivity based on expert consensus).

When the consensus article (Russek, 2023) did not classify a test, this has been left blank.

† Y=Yes, symptom/history present; N=No, symptom/history not present; NA=Not Assessed.

‡ Red Flag symptoms and history are listed in italics

Table from Chalela & Russek, 2024

Table 2. Determining the Irritability of Upper Cervical Instability Based on Symptoms/History

A. Condition is severe:	
• Poor tolerance to any time vertical	
• Bed bound due to cervical symptoms	
• Need to use a walker or wheelchair due to moderate or intermittently severe problems with coordination and balance rather than pain or weakness, or restricted to bed due to cervical symptoms	
• Extreme cervical spine guarding with fear of movement secondary to severe reactivity	
• Choking, trouble swallowing, and voice changes	
• Profound visual disturbances	
• Severe nausea with any neck movement	
• Functional outcome measure relevant to UCI classified as Severe	
B. Condition is easily flared:	
• UCI flares are disproportionate compared to provoking insult or activity. e.g., aggravated by minor rapid/unexpected movements/perturbations, traveling in car/bus, prolonged postures.	
• Presyncope, syncope, drop attacks or seizure-like episodes with neck extension or rotation.	
• History of excessive provocation associated with previous conservative care including hands-on manual therapy or exercise.	
C. Prolonged time to calm after flare:	
• Provoked UCI symptoms take excessive time to settle to pre-flare state: e.g., more than 24 h for pain or more than several hours for neurological symptoms	
• Pt regularly needs to resort to wearing a cervical collar or bedrest to ease symptoms after a flare	
• Inability to tolerate being upright for > 24 h after flare	
Irritability Grade	

† Y=Yes, symptom/history present; N=No, symptom/history not present; NA=Not Assessed.

Grading mechanical irritability

Low irritability:

- A, B, and C are all typically absent, or
- B or C might be occasionally present at a low level.

Moderate irritability:

- A, B, or C are intermittently present, or
- A or B or C is frequently present, but not all three consistently.

High irritability:

- A, B, and C are all frequently present.

Table from Chalela & Russek, 2024

Table 3. UCI Physical Tests for Upper Cervical Instability: Safe for All Patients.

Tests Safe for All Patients	XCS*	
Observation based tests		
Posture, full body, sitting and/or standing, and segmental alignment	XC	
Breathing pattern (chest vs. diaphragmatic, excessive accessory muscle use)	XC	
Significant muscle guarding or reluctance to move neck	C	
Observe gait for gross and fine motor dyscoordination not due to other joint hypermobility	S	
<i>Observe for cranial nerve VII dysfunction: Lip drooping, unequal smile, eyelid twitching[‡]</i>	S	
<i>Observe for dystonia, myoclonic jerking[‡]</i>	S	
<i>Ataxia, gross neurogenic gait abnormalities, inability to perform tandem gait, Romberg sign present[‡]</i>		
<i>FASTER Indications of stroke: Face, Arms, Stability (standing), Talking, Eyes. R is for React. [‡]</i>		
Neurological tests		
Testing of hand dexterity (need to distinguish from finger hypermobility). E.g., grip release test	S	
<i>Cranial nerve III, IV, V, VI tests: Altered visual field, eye movement, unequal pupil size, amblyopia (lazy eye), facial sensory loss[‡]</i>	S	
<i>Reflex tests not involving neck: e.g., Hoffmann, Babinski, clonus, hypertonia[‡]</i>	S	
<i>Cranial nerve X, XII tests: Uvula, tongue (avoid gag), speech or swallowing dysfunction, choking[‡]</i>	S	
<i>Dysdiadochokinesia: e.g., rapidly alternating pronation/supination, grip release, fast finger or foot tapping[‡]</i>	S	
<i>Abnormal vertebrobasilar insufficiency tests with auditory and vision changes, evidence of vertigo, presyncope or syncope[‡]</i>		
Other tests		
Palpation for muscle spasm, especially suboccipitals, sternocleidomastoid, levator scapulae, upper trapezius	C	
Use of a rigid cervical brace for several weeks decreases signs and symptoms	S	

* S=Highly Suggestive finding for upper cervical instability (high specificity based on expert consensus)

* C=Common finding in upper cervical instability (high sensitivity based on expert consensus)

* X= Contributing Factor

When the consensus article did not classify a test, this has been left blank

‡ Red Flag tests are noted in italics.

Table from Chalela & Russek, 2024

Many of these assessment techniques are demonstrated on the following website created by Flex-ability physio:

<https://www.youtube.com/playlist?list=PLKBimuL9ff9g0TFaaNQZ4Yh7rTgR97SPk>

Table 4. UCI Physical Tests for ONLY Moderate and Low Irritability Patients

	XCS*	
Other motion and control		
Thoracic range of motion, range, and quality	XC	
Scapular muscle strength and motor control	XC	
Excessive use of temporomandibular muscles to provide cervical stabilization (secondary finding)	C	
Neck motion and control		
Cervical range of motion: Overall, looking for apprehension, range, and quality	CS	
Deep neck flexor recruitment efficiency	XC	
Cervical stabilizer motor control inhibition and inefficient recruitment (e.g., craniocervical flexion test, suboccipital extensor test)	XC	
Sensorimotor tests: Eye-head coordination, trunk-head coordination, smooth pursuit visual tracking	XC	
Cervical proprioception: Joint position error	XC	
Other tests		
Neurodynamic tests may be cautiously performed, eliminating or caution with neck motion	XC	
Orthostatic intolerance: NASA lean test or stand test	CS	
Other cranial nerve tests, not safe for High Irritability patients (include gag)	S	
Structural tests		
Cervical axial load in supine	S	
Alignment of C1 (manual assessment)	S	

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* C=Common finding in upper cervical instability (high sensitivity based on expert consensus)

* X= Contributing Factor

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Table 5. UCI Physical Tests for ONLY Low Irritability Patients

	XCS*	
Ligamentous testing		
Abnormal passive accessory intervertebral movements (PAIVMs) or passive physiological intervertebral movements (PPIVMs) at OA and AA (if trained)	XC	
Alar ligament test	S	
Modified Sharp-Purser Cervical instability relocation test (NOT the provocation test)	S	
Cervical distraction in supine	CS	
Mobility tests		
Isolated AA ROM	CS	
Neurodynamic tests with neck motion	CS	
Provocation tests		
Craniocervical flexion test provocation of UCI symptoms.	C	
Vertebrobasilar insufficiency positional test	S	

* S=Highly Suggestive finding for upper cervical instability (high specificity based on expert consensus)

* C=Common finding in upper cervical instability (high sensitivity based on expert consensus)

* X= Contributing Factor

Table from Russek, et al, 2023.

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Table 6. Interventions for all Patients, and Interventions to Avoid in High Irritability Patients

<p><u>General education</u></p> <ul style="list-style-type: none">o About G-HSD/hEDS and UCIo “Safety Netting”: recognizing signs & symptoms that trigger emergency or urgent follow-up or referral; self-care in these situations (e.g., wear cervical brace) <p><u>Posture and body mechanics education</u></p> <ul style="list-style-type: none">o Sitting, standing, and sleeping posture, positioning, and body supporto Body awareness and mindfulness in various positions (sitting, standing, lying down)o Avoiding or limiting neck motion if small range motion is safeo Functional training for posture and joint protection during essential ADLs such as bathing, brushing teeth, brushing hair, washing hair, sleeping postures, putting in contacts, eating, etc.o Body mechanics, ergonomics, joint protection, activity pacingo Orthotics and braces, as needed throughout the lower extremities and lumbar spine, to provide stable base for cervical spineo Importance of shoe-wear support for spinal alignment <p><u>Pain science and pain self-care</u></p> <ul style="list-style-type: none">o Relaxation, autonomic nervous system balancing (not requiring neck movement)o Breathing, e.g., diaphragmatic or slow breathingo Pain neuroscience education, addressing catastrophization, mindful use of language to enhance feelings of safetyo Self-care ‘toolbox’: e.g., pain management strategies (e.g., heat, ice, transcutaneous electroneural stimulation, topical analgesics, relaxation, positive thinking, etc.) <p><u>Neck bracing (if appropriate)</u></p> <ul style="list-style-type: none">o Education about use of neck brace: how to put on, how often to use, when to use (e.g., during ADLs, flares, car travel)o Custom fitting of rigid or soft cervical brace <p><u>Manual Therapy</u></p> <p>Some High Irritability patients will not tolerate manual therapy, even remote from the neck, and it should be discontinued if not tolerated.</p> <ul style="list-style-type: none">o Cautious myofascial release, trigger point release or neuromuscular inhibition techniques in the thoracic and lumbar spine, scapulae, lower and upper extremities.o Cautious myofascial release, trigger point release or neuromuscular inhibition in the upper trapezius, levator scapulae, and sternocleidomastoid ONLY by clinicians with G-HSD/UCI expertise <p><u>Motor control</u></p> <p>Some High Irritability patients will not tolerate motor control training, even remote from the neck, and this should be discontinued if not tolerated. These should be done with neck, torso and limbs suitably supported, generally in neutral position.</p> <ul style="list-style-type: none">o Eye movement muscle energy techniqueso Pelvic and lumbar stability training; finding pelvic neutral. Ensure that the cervical spine is optimally aligned and supported

- Motor control training of the cervical spine, near mid-line
- Supine with head supported, scapular recruitment in neutral 'safe zone', side lying supported head and arm

Aerobic exercise

- e.g., Recumbent bike, pedal exerciser (if there is no indication of neural tension/tethered cord)

Interventions to AVOID with High Irritability Patients

- Exercises involving moderate to large neck movements, such as cervical range of motion
 - Some patients will not tolerate any neck movement, even chin tucks
 - Isometrics with more than minimal force
- Cervical axial loading (weight on head) or distraction (manual or mechanical)
- Only therapists with G-HSD/UCI expertise should perform any manual therapy to the cervical spine, and some patients may not tolerate any manual therapy, even by experts
- Positioning that creates neural tension (e.g., pelvic tilt in some people) or isometric load (e.g., quadruped) to the cervical spine

Tables 6-8 are from:

- Russek LN, Block NP, Byrne E, et al. Presentation and physical therapy management of upper cervical instability in patients with symptomatic generalized joint hypermobility: International expert consensus recommendations. *Front Med (Lausanne)*. 2023;9:1072764. doi:10.3389/fmed.2023.1072764

Table 7. Interventions for Patients with Moderate Irritability

<ul style="list-style-type: none">• All interventions discussed in Table 12 <p><u>Education</u></p> <ul style="list-style-type: none">• Functional training, as described in Table 11 plus: Meal preparation, positional training for ADL and IADLs, standing, pivoting, stand pivoting, squatting, half-kneeling, pushing/pulling light objects, rotational upright core training, sweeping, shopping, light housework, carrying, driving, and lifting. <p><u>Motor control and strength training</u></p> <ul style="list-style-type: none">• Proprioception, motor control, and strengthening exercises for:<ul style="list-style-type: none">○ Lower extremities, including knee, foot, ankle○ Shoulders and scapulae○ Thoracic spine○ Continue and progress for pelvis and lumbar spine• Proprioception, motor control, and stabilization training for the cervical spine through available pain-free range. This may include using the head laser, starting by maintaining the head stable while moving the arms or legs, walking, and gradually progressing to small, controlled neck movements• Gentle axial loading of the cervical spine (e.g., up to 1 pound/450 grams) if tolerated• Low load cervical isometrics, with cuing to deactivate superficial muscles <p><u>Manual therapy:</u></p> <ul style="list-style-type: none">• Manual therapy for 1st rib, thoracic spine, acromioclavicular and sternoclavicular joints• Soft tissue techniques for cervical muscles in spasm, physiological quieting• Gentle manual techniques for C1 and C2 (if the therapist is trained)• AVOID aggressive soft tissue or joint-based manual therapy to the cervical spine <p><u>Aerobic exercise:</u></p> <ul style="list-style-type: none">• E.g., Recumbent bike/peddler (if no neural tension signs); walking
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Tables 6-8 are from:

- Russek LN, Block NP, Byrne E, et al. Presentation and physical therapy management of upper cervical instability in patients with symptomatic generalized joint hypermobility: International expert consensus recommendations. *Front Med (Lausanne)*. 2023;9:1072764. doi:10.3389/fmed.2023.1072764

Table 8. Interventions for Patients with Low Irritability

<ul style="list-style-type: none">• All interventions discussed in Tables 12 and 13 <p><u>Education</u></p> <ul style="list-style-type: none">• Functional training, as described in Boxes 8 and 9, plus: Occupation related functional training, i.e.: prolonged desk work, phone, heavier household chores, gardening, etc. Sports specific training with precautions such as avoiding contact sports such as football or modification to sports such as no 'heading' the ball <p><u>Manual therapy:</u></p> <ul style="list-style-type: none">• Additional muscle energy techniques in the cervical spine <p><u>Motor control and strength training</u></p> <ul style="list-style-type: none">• Proprioception and motor control using larger cervical ranges. Cervical axial loading may decrease symptoms during proprioceptive training• Trunk-head coordination, eye-head coordination, eye-balance exercises• Resistance training for the cervical spine• Return to function/sport exercises, if appropriate, which may include more aggressive exercise, if tolerated. These may include perturbation, unpredictable challenges, and more endurance exercise for the neck <p><u>Aerobic exercise:</u></p> <ul style="list-style-type: none">• E.g., Walking, recumbent or upright bike. Some patients may tolerate running, swimming, aerobics with or without precautions
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Tables 6-8 are from:

- Russek LN, Block NP, Byrne E, et al. Presentation and physical therapy management of upper cervical instability in patients with symptomatic generalized joint hypermobility: International expert consensus recommendations. *Front Med (Lausanne)*. 2023;9:1072764. doi:10.3389/fmed.2023.1072764