



PERFORMING ARTS

SPECIAL INTEREST GROUP



ORTHOPAEDIC SECTION
AMERICAN PHYSICAL THERAPY ASSOCIATION



PASIG MONTHLY CITATION BLAST: No.67

December 2011

Dear PASIG members:

As this December Blast reaches you, happy holidays to all and may they lack stress! Here in New York, we are always busy covering backstage throughout December and through New Year's Eve. It makes the holidays a bit challenging!

PASIG programming for CSM 2012 will occur on Friday, February 10th, from 8:00am to 12:30pm. Our PASIG business meeting will be held directly following the programming in the same room. Our program topic this year is "*The Core of the Matter: from the Hips to the Lips*" with Mary Massery, Jeff Stenback, and Amy Humphrey speaking.

Our new Research Committee Chair, Annette Karim PT, DPT, OCS, will begin to work with me in January, prior to CSM. Please let us both know of ideas you may have for research-related new projects or content for the PASIG Research Committee.

PERFORMING ARTS CONTINUING EDUCATION AND CONFERENCES

****Performing Arts Independent Study Courses****

Orthopaedic Section Independent Study Course. *20.3 Physical Therapy for the Performing Artist.*

Monographs are available for:

- Figure Skating (J. Flug, J. Schneider, E. Greenberg),
- Artistic Gymnastics (A. Hunter-Giordano, Pongetti-Angeletti, S. Voelker, TJ Manal), and
- Instrumentalist Musicians (J. Dommerholt, B. Collier).

Contact: Orthopaedic Section at: www.orthopt.org

Orthopaedic Section Independent Study Course. *Dance Medicine: Strategies for the Prevention and Care of Injuries to Dancers.*

This is a 6-monograph course and includes many PASIG members as authors.

- Epidemiology of Dance Injuries: Biopsychosocial Considerations in the Management of Dancer Health (MJ Liederbach),
- Nutrition, Hydration, Metabolism, and Thinness (B Glace),
- The Dancer's Hip: Anatomic, Biomechanical, and Rehabilitation Considerations (G. Grossman),
- Common Knee Injuries in Dance (MJ Liederbach),
- Foot and Ankle Injuries in the Dancer: Examination and Treatment Strategies (M. Molnar, R.

Bernstein, M. Hartog, L. Henry, M. Rodriguez, J. Smith, A. Zujko),
- Developing Expert Physical Therapy Practice in Dance Medicine – (J. Gamboa, S. Bronner, TJ Manal).
Contact: Orthopaedic Section at: www.orthopt.org

Harkness Center for Dance Injuries, Hospital for Joint Diseases. Principles of Dance Medicine: Clinical management of the dancer patient. New York, NY, July 12 – 15, 2012. <http://hjd.med.nyu.edu/harkness/education/healthcare-professionals/upcoming-educational-courses>

Performing Arts Medical Association (PAMA). 30th Annual Symposium: Medical Problems of Performing Artists, Snowmass, CO, July 26 – 29, 2012. Contact: <http://www.artsmed.org>

International Association for Dance Medicine and Science: 22nd Annual Meeting, Singapore. October 25 – 28, 2012. Contact: <http://www.iadms.org>

For this December Citation BLAST, Rebecca Huesman compiled the topic, “Hypermobility: Incidence, evaluation, and rehabilitation following injury.” The format is an annotated bibliography of articles generally from the last decade. The PASIG Research Committee initiated this monthly Citation BLAST on performing arts-related topics in June 2005 in the hopes of encouraging our members to stay current in the literature and, perhaps, consider conducting research themselves. Each month we send a new list of performing arts (PA) citations to members of the PASIG to further the pursuit of PA-related scholarship. (Information about EndNote referencing software can be found at <http://www.endnote.com>, including a 30-day free trial).

Regards,
Shaw

Shaw Bronner PT, PhD, OCS
Chair, PASIG Research Committee
sbronner@liu.edu

PASIG Research Committee members

Incoming Research Committee Chair, Annette Karim PT, DPT, OCS,
neoluvsonlyme@aol.com

Jeff Stenback PT, OCS, jsptocs2@hotmail.com

Sheyi Ojofeitimi PT, DPT, sojofeit@gmail.com

Jennifer Gamboa PT, DPT, OCS, jgamboa@bodydynamicsinc.com

Susan D. Fain PT, DMA, sfain@ptcentral.org

Hypermobility: Incidence, evaluation, and rehabilitation following injury

Within the rheumatology literature, generalized joint hypermobility has been linked to increased fatigue and decreased exercise tolerance leading to injury, especially in pediatric populations. With this foundation, subsequent questions follow, including how can physical therapy intervene to minimize injury incidence and maximize recovery and what specific relationship does hypermobility have to dance? Some recent articles listed in this Citation Blast demonstrate the expansion of the literature into the realm of physical rehabilitation and using dance-specific populations. However, to date, the greatest body of literature on this topic is based on rheumatologic studies focused on age tiers rather than functional tiers.

In many styles of dance, hypermobility is generally a sought after aesthetic. The most common measure of generalized hypermobility at present is the Beighton scale. This scale has been previously validated; however some of the new literature presents some conflicting evidence on the applicability of this measure in dance populations. An ability to appropriately identify hypermobility in dancers is important because a link has been proposed that joint hypermobility is linked to potential deconditioning and decreased tolerance for exercise. These factors may be contributing to fatigue and subsequent injury.

Exercises to improve strength and joint position sense have been demonstrated to decrease pain and to improve functional ability in some populations. As the body of evidence continues to grow, specific interventions most appropriate to dance populations will be elucidated. In the interim, rehabilitation and prevention plans can be developed on the foundational knowledge regarding hypermobility in the rheumatology literature.

Rebecca Huesman, SPT
University of Delaware
Newark, DE

Cameron KL, Owens BD, Wolf JM. Impact of joint laxity and hypermobility on the musculoskeletal system. J Am Acad Orthop Surg, 2011; 19 (8): 463-471.

Excessive joint laxity, or hypermobility, is a common finding of clinical importance in the management of musculoskeletal conditions. Hypermobility is common in young patients and in general is associated with an increased incidence of musculoskeletal injury. Hypermobility has been implicated in ankle sprains, anterior cruciate ligament injury, shoulder instability, and osteoarthritis of the hand. Patients with hypermobility and musculoskeletal injuries often seek care for diffuse musculoskeletal pain and injuries with no specific inciting event. Orthopaedic surgeons and other healthcare providers should be aware of the underlying relationship between hypermobility and musculoskeletal injury to avoid unnecessary diagnostic tests and inappropriate management. Prolonged therapy and general conditioning are typically required, with special emphasis on improving strength and proprioception to address symptoms and prevent future injury. Orthopaedic surgeons must recognize the implications of joint mobility syndromes in the management and rehabilitation of several musculoskeletal injuries and orthopaedic disorders.

Celletti C, Castori M, Grammatico P, Camerota F. Evaluation of lower limb disability in joint hypermobility syndrome. Rheumatol Int. 2011 Jul 27. [Epub ahead of print]

The aim of this study is to evaluate degree and possible major determinants of lower limb disability in joint hypermobility syndrome. Forty patients with joint hypermobility syndrome were studied. Lower limb function was evaluated with the lower limb functional scale (LEFS). Intensity of pain was estimated by the numeric rating scale. Rough results were compared with previously published data for osteoarthritis patients. Within the studied population, comparisons were performed by age, sex, numeric rating scale and Beighton scores. In joint hypermobility syndrome, LEFS score was similar to osteoarthritis, but in the former, comparable values were observed with a ~10 year earlier onset. LEFS scores resulted significantly related to age, pain intensity and Beighton score. No correlation with sex was observed. This study demonstrated that, in joint hypermobility syndrome, disability of lower limbs is remarkable and related to the increase in pain and age and to the decrease in residual joint hypermobility. These preliminary results may be relevant for the identification of more efficient and tailored treatment programs.

Day H, Koutedakis Y, Wyon MA. Hypermobility and dance: a review. Int J Sports Med. 2011; 32(7): 485-489.

Joint hypermobility is defined as an excessive range of motion. Although the dance profession has often promoted hypermobility for aesthetic reasons, there is a belief amongst health professionals that potential risks associated with the condition may have been overlooked. The aims of this review were to examine the epidemiology of joint hypermobility in dancers; the effects on fatigue and bone health; the injury profile of hypermobile dancers; and the use of the Beighton score as a diagnostic tool. Depending on the criteria used, epidemiological studies suggest that hypermobility among dancers can be as high as 44%, especially in students. As hypermobility has been linked to fatigue in the general population, the hypermobile dancer should be careful given the association between fatigue and aetiology of injury in dance. Similarly, in light of research encouraging dancers to become fitter, this recommendation may not be appropriate for hypermobile dancers. In addition, the Beighton score used in most dance related studies may not be an appropriate measure of hypermobility in these populations. More research is necessary into this area to ascertain the reasons for the attrition rate from student to soloist/principal level and whether it is linked to dance health and injury issues.

Engelbert RH, van Bergen M, Henneken T, Helders PJ, Takken T. Exercise tolerance in children and adolescents with musculoskeletal pain in joint hypermobility and joint hypomobility syndrome. *Pediatrics*. 2006; 118(3): e690-e696.

OBJECTIVES. Musculoskeletal pain is a common complaint in a pediatric health care practice, but exercise tolerance has never been described in detail in these children. Our objectives for this study were to evaluate the maximal exercise capacity, including peak heart rate and oxygen consumption, of children with pain-related musculoskeletal problems, particularly in children with (symptomatic) generalized joint hypermobility and hypomobility, during a bicycle ergometry test to exhaustion; to evaluate muscle strength, bone mineral density, and sports activities in these children and to associate these observations with exercise capacity; and to compare these results with reference values. **METHODS.** Thirty-two children (mean age: 12.1 years; SD: 3.4 years; range: 6.2–20.1 years; 62% male) with musculoskeletal pain-related syndromes (joint hypermobility syndrome [$n = 13$] and joint hypomobility syndrome [$n = 19$]) participated. The reference group consisted of 117 healthy primary school prepubertal children, 167 healthy secondary school adolescents, and 98 young adults (249 girls and 133 boys; mean age total reference group: 14.5 ± 4.0 years; range: 8–20.8 years). Anthropometry, range of joint motion, muscle strength, bone mineral density (speed of sound and broadband ultrasound attenuation), sports activities, and a maximal exercise test using an electronically braked cycle ergometer were performed, and the patient stopped because of volitional exhaustion. Expired gas analysis and heart rate and transcutaneous oxygen saturation by pulse oximetry measurements also were performed. **RESULTS.** Children with joint hypomobility syndrome as well as children with joint hypermobility syndrome had a higher mean z score (SD) of weight and BMI compared with the reference group. A significantly decreased absolute peak oxygen consumption and relative peak oxygen consumption in both patient groups was found compared with control subjects. In 14 of 32 children with a z score relative peak oxygen consumption of less than -2 , maximal heart rate was significantly decreased compared with 18 children with a z score relative peak oxygen consumption of -2 or more (mean [SD] z score speed of sound: -1.3 [0.8] vs -0.5 [1.0] and mean [SD] heart rate: 175.9 [11.5] vs 187.5 [10.9], respectively). In the total group, a high significant correlation between the z score of relative peak oxygen consumption and the z score of the speed of sound was found as well as with z score of BMI. Sixteen (50%) of 32 participated in sports activities with (mean: 0.9 hours/week; SD: 1.4 hours/week), whereas in the control group, 12% of did not participate in sports activities (mean: 2.8 hours/week; SD: 2.2 hours/week). Children who participated in sports activities had a (borderline) significant increased mean (SD) z score of absolute peak oxygen consumption and mean (SD) z score of broadband ultrasound attenuation compared with children who did not participate in sports activities (-0.3 [1.1] vs -1.2 [1.3] and -0.45 [0.8] vs

-0.9 [0.5], respectively). **CONCLUSIONS.** In children with musculoskeletal pain-related syndromes, particular in children with (symptomatic) generalized joint hypermobility and hypomobility, maximal exercise capacity is significantly decreased compared with age- and gender-matched control subjects. The most probable explanation for the reduced exercise tolerance in our patients is deconditioning.

Fatoye F, Palmer S, Macmillan F, Rowe P, van der Linden M. Proprioception and muscle torque deficits in children with hypermobility syndrome. Rheumatology. 2009; 48(2):152-157.

OBJECTIVES: Sensorimotor deficits such as impaired joint proprioception and muscle weakness have been found in association with hypermobility syndrome (HMS) in adults. HMS is more common in children than adults, yet such deficits have not been adequately investigated in paediatric populations. It is therefore uncertain as to what sensorimotor deficits are present in children with HMS. This study investigated knee joint proprioception and muscle torque in healthy children and those with HMS. **METHODS:** Thirty-seven healthy children (mean age +/- s.d. = 11.5 +/- 2.6 yrs) and 29 children with HMS (mean age +/- s.d. = 11.9 +/- 1.8 yrs) participated in this study. Knee joint kinaesthesia (JK) and joint position sense (JPS) were measured, with the absolute angular error (AAE) calculated as the absolute difference between the target and perceived angles. Knee extensor and flexor muscle torque was assessed and normalized to body mass. Mann-Whitney U-tests were performed to compare JK, JPS and muscle torque between the two groups. **RESULTS:** Children with HMS had significantly poorer JK and JPS compared with the controls (both $P < 0.001$). Knee extensor and flexor muscle torque was also significantly reduced (both $P < 0.001$) in children with HMS compared with their healthy counterparts. **CONCLUSIONS:** The findings of this study demonstrated that knee joint proprioception was impaired in children with HMS. They also had weaker knee extensor and flexor muscles than healthy controls. Clinicians should be aware of these identified deficits in children with HMS, and a programme of proprioceptive training and muscle strengthening may be indicated.

Ferrell WR, Tennant N, Sturrock RD, Ashton L, Creed G, Brydson G, Rafferty D. Amelioration of symptoms by enhancement of proprioception in patients with joint hypermobility syndrome. Arthritis Rheum. 2004; 50(10): 3323-3328.

OBJECTIVE: Joint hypermobility syndrome (JHS) is characterized by an association between joint hypermobility and musculoskeletal pains, the latter occurring in the absence of any objective indicator of rheumatic disease. The lack of a recognizable disease marker makes this condition difficult to identify and manage. We previously observed that patients with JHS have impaired proprioception compared with that of a matched control group. The purpose of this study was to investigate whether a home-based exercise program could produce objective enhancement of proprioception as well as alleviate symptoms in JHS. **METHODS:** A threshold detection paradigm was used to assess knee joint proprioception, balance was assessed using a balance board, and quadriceps and hamstring strength were measured by an isokinetic dynamometer. A visual analog scale was used to assess musculoskeletal pain, and quality of life was evaluated by a Short Form 36 questionnaire. Assessments were performed before and after an 8-week program of progressive closed kinetic chain exercises. **RESULTS:** Following the exercise program, proprioceptive acuity increased in 16 of 18 subjects and was very significantly improved overall ($P < 0.001$). There was a comparable improvement in performance on the balance board ($P < 0.001$), and quadriceps and hamstring strength also increased significantly. Symptomatic improvement also occurred, in terms of both pain ($P = 0.003$) and quality-of-life ($P = 0.029$ for physical functioning; $P = 0.008$ for mental health) scores. **CONCLUSION:** Appropriate exercises lead not only to symptomatic improvement, but also to demonstrable enhancement of objective parameters such as proprioception.

Karim A, Millet V, Massie K, Olson S, Morgenthaler A. Inter-rater reliability of a musculoskeletal screen as administered to female professional contemporary dancers. Work. 2011; 40(3): 281-288.

Objective: The purpose of this study is to determine the inter-rater reliability of commonly used musculoskeletal screening components in a population of contemporary professional dancers. **Participants:** Study participants were 30 women from six contemporary dance companies between the ages of 18 and 32, with a mean age of 24, and Body Mass Index of 22.4. **Methods:** 101 items were assessed in the categories of Static Posture, the Beighton 9-Point Hypermobility Test, Flexibility, Strength, and Dynamic Posture, based upon the Pilot 2006 Dance USA Annual Post-Hire Health Screen for Professional Dancers [3]. Testing was non-ordered, using 2 of the 4 available testers, with variable assignment of the lead tester. **Results:** High percent agreement was found for the subcategories of hallux valgus, pelvic tilt, and forefoot alignment, flexor hallucis, iliopsoas, hip internal rotation flexed, external rotation extended, and soleus extensibility, composite Beighton, and for most measures within the dynamic posture category. Low to moderate percent agreement was found in the strength tests. **Conclusion:** Although this study demonstrated moderate to high percent agreement between raters, further test refinement is needed to improve the reliability of the measurement components.

Keer R, Simmonds J. Joint protection and physical rehabilitation of the adult with hypermobility syndrome. Curr Opin Rheumatol. 2011; 23(2):131-136.

PURPOSE OF REVIEW: Hypermobility and hypermobility syndrome are common conditions with universal interest. However, despite significant advances in our knowledge of the presentation and implications of lax tissues there is still much to learn about the best way to manage the symptoms. This review discusses our current knowledge on the management of joint problems associated with hypermobility syndrome. **RECENT FINDINGS:** Relieving joint pain and preventing its recurrence are primary aims of treatment and exercise to improve joint stability and control is a major component of physical rehabilitation. Research has identified that posture, proprioception, strength and motor control are important components in achieving this aim along with education, physical activity and fitness. **SUMMARY:** It is not yet known what form the optimal physical rehabilitation programme should take, but the components discussed here are based on sound scientific principles which it is hoped will further knowledge, stimulate interest and promote further research.

Kemp S, Roberts I, Gamble C, Wilkinson S, Davidson JE, Baildam EM, Cleary AG, McCann LJ, Beresford MW. A randomized comparative trial of generalized vs targeted physiotherapy in the management of childhood hypermobility. Rheumatology. 2010; 49(2): 315-325.

OBJECTIVE: Joint hypermobility, common in childhood, can be associated with severe pain and significant morbidity. Physiotherapy, the mainstay of treatment, lacks a robust evidence base. This study is aimed at determining the best physiotherapy intervention in managing childhood hypermobility. **METHODS:** A prospective randomized comparative trial (RCT) compared a 6-week generalized programme, improving muscular strength and fitness, with a targeted programme aimed at correcting motion control of symptomatic joints. Patients were assessed on symptom scores (pain/global-impact), function, muscle strength and fitness. **RESULTS:** Fifty-seven children, aged 7-16 years with symptomatic hypermobility, were randomly assign to receive a targeted (T; n = 30) or generalized (G; n = 27) programme. Statistically significant improvements were demonstrated in both the children's and parental pain scores across both the randomized groups between baseline and follow-up assessments ($P < 0.05$). However, the difference in improvement between the groups was not statistically significant. Child's assessment of change in pain score: mean difference (95% CI) T - G, 3.97 (-15.59, 20.85) at the end of treatment and 9.41 at 3-month follow-up (-17.42, 36.24). At the end of treatment, parental assessment of change in pain score, T - G was: -0.27 (-15.05, 14.50) and at 3-month follow-up it was: -9.48 (-26.40, 7.43). Change in

parental global assessment was statistically significant, in favour of targeted physiotherapy at final assessment: -21.29 (-40.03, -2.55). CONCLUSION: This is the first physiotherapy RCT for treating hypermobility. It demonstrated significant and sustained reduction in pain when both groups were combined, but did not detect any difference between the groups. This study provides normative and methodological data for future studies of hypermobility.

McCormack M, Briggs J, Hakim A, Grahame R. Joint laxity and the benign joint hypermobility syndrome in student and professional ballet dancers. J Rheumatol. 2004; 31(1):173-178.

OBJECTIVE: To ascertain the prevalence of hypermobility and the benign joint hypermobility syndrome (BJHS) in male and female student and professional ballet dancers, and explore whether BJHS has any effect on a dance career. METHODS: Students from the Royal Ballet School and professional dancers from the Royal Ballet Company, London, were compared with a control group of teenagers and adults from a local secondary school and The Royal Opera House, respectively. The data, examined by variance analysis, included anthropometric variables, the Beighton score, and clinical features constituting BJHS. Odds ratios for hypermobility and BJHS in dancers were calculated, and the prevalence and distribution of BJHS was examined. RESULTS: Hypermobility and BJHS were common in male and female dancers compared with controls. An OR of 11.0 (95% CI 3.3-31.8) was found for hypermobility in dancers for both the ballet school and the professional company. The prevalence of BJHS was found to decline both from student to professional and within the ballet company from corps de ballet to Principal. Odds ratios for BJHS in student dancers were significant, OR = 3.9 (95% CI 1.3-11.3), but not so in professional dancers: OR = 1.7 (95% CI 0.6-4.7). Arthralgia was common in dancers and was reported more often in males than females. In females, pain was reported most by dancers with other features of BJHS, in particular stretchy skin. CONCLUSION: Hypermobility and BJHS are common in both male and female student and professional ballet dancers. The fall in prevalence, and the greater reporting of arthralgia with other features of BJHS in young female dancers, suggests that BJHS may have an important negative influence, and this may have implications for training. The same pattern was not observed in males, suggesting that their pain-reporting and injury are related to factors other than BJHS.

Roussel NA, Nijs J, Mottram S, Van Moorsel A, Truijen S, Stassijns G. Altered lumbopelvic movement control but not generalized joint hypermobility is associated with increased injury in dancers: A prospective study. Manual Therapy. 2009; 14(6): 630-635.

Dancers experience significant more low back pain (LBP) than non-dancers and are at increased risk of developing musculoskeletal injuries. Literature concerning the relationship between joint hypermobility and injury in dancers remains controversial. The purpose of this study was therefore to examine whether lumbopelvic movement control and/or generalized joint hypermobility would predict injuries in dancers. Four clinical tests examining the control of lumbopelvic movement during active hip movements were used in combination with joint hypermobility assessment in 32 dancers. Occurrence of musculoskeletal injuries, requiring time away from dancing, was recorded during a 6-month prospective study. Logistic regression analysis was used to predict the probability of developing lower limb and/or lumbar spine injuries. Twenty-six injuries were registered in 32 dancers. Forty-four percent of the dancers were hypermobile. A logistic regression model using two movement control tests, correctly allocated 78% of the dancers. The results suggest that the outcome of two lumbopelvic movement control tests is associated with an increased risk of developing lower extremities or lumbar spine injuries in dancers. Neither generalized joint hypermobility, evaluated with the Beighton score, nor a history of LBP was predictive of injuries. Further study of these interactions is required.

Sahin N, Baskent A, Cakmak A, Salli A, Ugurlu H, Berker E. Evaluation of knee proprioception and effects of proprioception exercise in patients with benign joint hypermobility syndrome. Rheumatol Int. 2008; 28(10): 995-1000.

The first aim is to show if there is a disorder in proprioception in cases with benign joint hypermobility syndrome (BJHS) when compared to healthy subjects. The second aim is to evaluate the effect of proprioception exercise in BJHS cases. To evaluate the proprioceptive sensibility of the knee joint with 40 BJHS and 30 healthy subjects enrolled in the study. Then, cases with BJHS were randomized into two groups; proprioceptive exercises were applied to 15 patients for 8 weeks in clinic and 25 patients were taken as controls. Outcome measures included proprioceptive sensation, AIMS2 and VAS. Proprioception is significantly impaired in cases with BJHS. In BJHS group, significant decreases in VAS levels were detected in cases who did exercise compared with cases who did not, and statistically significant improvements were detected in occupational activity. For this reason proprioception exercises cause decrease in pain and improvement of functional status in BJHS group.

Simmonds JV, Keer RJ. Hypermobility and the hypermobility syndrome, part 2: assessment and management of hypermobility syndrome: illustrated via case studies. Manual Therapy. 2008; 13(2): e1-e11.

Joint hypermobility syndrome (JHS) is a largely under-recognised and poorly understood multi-systemic hereditary connective tissue disorder which manifests in a variety of different clinical presentations. The assessment and management of patients with the syndrome is often complicated, requiring a comprehensive patient-centred approach and co-ordinated input from a range of medical, health and fitness professionals. The functional rehabilitation process is frequently lengthy, with education of the patient and family, sensitively prescribed and monitored physical therapy interventions and facilitation of lifestyle and behaviour modifications being the mainstay of the plan. Two typical but very different case studies are presented, each illustrating key aspects of the assessment and highlighting the variety of management strategies and techniques required by therapists to facilitate successful outcomes.

Simmonds JV Keer RJ. Hypermobility and the hypermobility syndrome. Manual Therapy. 2007;12(4): 298-309.

Hypermobile joints by definition display a range of movement that is considered excessive, taking into consideration the age, gender and ethnic background of the individual. Joint hypermobility, when associated with symptoms is termed the joint hypermobility syndrome or hypermobility syndrome (JHS). JHS is an under recognised and poorly managed multi-systemic, hereditary connective tissue disorder, often resulting in a great deal of pain and suffering. The condition is more prevalent in females, with symptoms frequently commencing in childhood and continuing on into adult life. This paper provides an overview of JHS and suggested clinical guidelines for both the identification and management of the condition, based on research evidence and clinical experience. The Brighton Criteria and a simple 5-point questionnaire developed by Hakim and Grahame, are both valid tools that can be used clinically and for research to identify the condition. Management of JHS frequently includes; education and lifestyle advice, behaviour modification, manual therapy, taping and bracing, electrotherapy, exercise prescription, functional rehabilitation and collaborative working with a range of medical, health and fitness professionals. Progress is often slow and hampered by physical and emotional setbacks. However with a carefully considered management strategy, amelioration of symptoms and independent functional fitness can be achieved.