

**PASIG PERFORMING ARTS**  
SPECIAL INTEREST GROUP



**ORTHOPAEDIC SECTION**  
AMERICAN PHYSICAL THERAPY ASSOCIATION



PASIG MONTHLY CITATION BLAST: No.90

January 2014

Dear Performing Arts SIG members:

CSM 2014 is February 3-6. I hope to see you there! Conference information and handouts are up, take a look:

<http://www.apta.org/csm/>



**CSM 2014 PASIG programming in Las Vegas: Wednesday, February 5th**  
*“A multidisciplinary approach in caring for the acrobatic athlete in the performing arts.”*

**The speakers are:**

**Kerry Gordon, MS, ATC, CMT, CSCS, PES**

**Steve McCauley, ATC, CSCS**

**Chad Hason, MD**

**Tiffney Touton, PT, DPT, LAT, ATC, CSCS**

**Frank Perez, ATC**

**They will present on behind the scenes care of performers, epidemiology of injuries, assessments of hypermobile performers and management of hip and shoulder pathologies.**

**Remember, the PASIG business meeting follows immediately after the presentations, and all PASIG members, including students, are welcome to join!** If you have research ideas or any ideas you would like to discuss at the meeting, or would like to meet with me about at CSM over coffee, please email me soon. ***I truly hope to see you there!*** **PASIG membership is free to all orthopaedic section members, so please join us.**

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Can't make it to CSM?

Our second **annual Orthopaedic Section Meeting will be May 15-17, 2014, in St. Louis, Missouri**, at the Hyatt Regency at the Arch. The two-day meeting will focus on: ***"The Triangle of Treatment: Integrating Movement System Impairments, Manual Therapy and the Biopsychosocial Approach in the Treatment of the Upper Quarter"***

More information will be posted soon at the following website:

<http://www.orthopt.org/content/home>

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This month's citation blast is on hypermobility, injury prevention, and rehabilitation in musicians, with a focus on the upper extremity. I hope the articles are useful in your patient care!

The practice of compiling abstracts has been an easy way for interns and clinicians to provide content for a citation blast as well as prepare for a clinical inservice or case study report. Please consider compiling Performing Arts-related abstracts for a citation blast this year. It's easy to do, and a great way to become involved with PASIG! Just take a look at our Performing Arts Citations and Endnotes, look for what's missing, and email Brooke Winder your contribution or ideas on future citation blasts. [brookeRwinder@gmail.com](mailto:brookeRwinder@gmail.com)

[http://www.orthopt.org/content/special\\_interest\\_groups/performing\\_arts/citations\\_endnotes](http://www.orthopt.org/content/special_interest_groups/performing_arts/citations_endnotes)

**I would like to introduce Brooke Winder, PT, DPT, OCS, as your new PASIG research chair.** She and I have collaborated on several projects, and I am looking forward to her leadership in this area. Brooke is also organizing the production of a wellness screen for the young, pre-professional dancer. Please send her an email about citation blast content and input on the wellness screen. I will take sign-ups on her behalf at our PASIG business meeting.

I would also like to take this time to thank **Julie O'Connell, our PASIG president**, as she has diligently and faithfully served our membership over the past several years.

***Thank you, Julie!!***

She is passing the baton to me, and I will endeavor to move our SIG's interests forward. I hope you attend the PASIG business meeting, take time to thank Julie, and give me an earful on what you would like us to do as a SIG in the next year.

Best regards,

*Annette*

Annette Karim, PT, DPT, OCS, FAAOMPT  
Outgoing Research Chair and Incoming President, PASIG  
Home: [neoluvsonlyme@aol.com](mailto:neoluvsonlyme@aol.com) Work: [akarim@evergreenpt.net](mailto:akarim@evergreenpt.net)

PASIG Research Committee members:

Shaw Bronner PT, PhD, OCS, [sbronner@liu.edu](mailto:sbronner@liu.edu)

Jeff Stenback PT, OCS, [jsptocs2@hotmail.com](mailto:jsptocs2@hotmail.com)

Sheyi Ojofeitimi PT, DPT, OCS, [sojofeit@gmail.com](mailto:sojofeit@gmail.com)

Jennifer Gamboa PT, DPT, OCS, [jgamboa@bodydynamicsinc.com](mailto:jgamboa@bodydynamicsinc.com)

Susan D. Fain PT, DMA, [sfain@ptcentral.org](mailto:sfain@ptcentral.org)

Brooke Winder, PT, DPT, OCS, [brookeRwinder@gmail.com](mailto:brookeRwinder@gmail.com)

Laura Reising, MS, PT, DPT, [lbreising@gmail.com](mailto:lbreising@gmail.com) (EndNote Organizer)

PERFORMING ARTS CONTINUING EDUCATION, CONFERENCES, AND RESOURCES

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](http://www.orthopt.org)

Orthopaedic Section-American Physical Therapy Association,  
Performing Arts SIG

[http://www.orthopt.org/content/special\\_interest\\_groups/performing\\_arts](http://www.orthopt.org/content/special_interest_groups/performing_arts)

Performing Arts Citations and Endnotes

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ADAM Center

<http://www.adamcenter.net/>

Publications:

<http://www.adamcenter.net/#!vstc0=publications>

Conference abstracts:

<http://www.adamcenter.net/#!vstc0=conferences>

Dance USA

<http://www.danceusa.org/>

Research resources:

<http://www.danceusa.org/researchresources>

Professional Dancer Annual Post-Hire Health Screen:

<http://www.danceusa.org/dancerhealth>

Dancer Wellness Project

<http://www.dancerwellnessproject.com/>

Becoming an affiliate:

<http://www.dancerwellnessproject.com/Information/BecomeAffiliate.aspx>

Harkness Center for Dance Injuries, Hospital for Joint Diseases

<http://hjd.med.nyu.edu/harkness/>

Continuing education:

<http://hjd.med.nyu.edu/harkness/education/healthcare-professionals/continuing-education-courses-cme-and-ceu>

Resource papers:

<http://hjd.med.nyu.edu/harkness/dance-medicine-resources/resource-papers-and-forms>

Links:

<http://hjd.med.nyu.edu/harkness/dance-medicine-resources/links>

Informative list of common dance injuries:

<http://hjd.med.nyu.edu/harkness/patients/common-dance-injuries>

Research publications:

<http://hjd.med.nyu.edu/harkness/research/research-publications>

International Association for Dance Medicine and Science (IADMS)

<http://www.iadms.org/>

Resource papers:

<http://www.iadms.org/displaycommon.cfm?an=1&subarticlenbr=186>

Links:

<http://www.iadms.org/displaycommon.cfm?an=5>

Medicine, arts medicine, and arts education organization links:

<http://www.iadms.org/displaycommon.cfm?an=1&subarticlenbr=5>

Publications:

<http://www.iadms.org/displaycommon.cfm?an=3>

Performing Arts Medicine Association (PAMA)

<http://www.artsmed.org/>

<http://www.artsmed.org/symposium.html>

Interactive bibliography site:

<http://www.artsmed.org/bibliography.html>

Related links:

<http://www.artsmed.org/relatedlinks.html>

Member publications:

<http://artsmed.org/publications.html>

***(Educators, researchers, and clinicians, please continue to email your conference and continuing education information to include in future blasts)***

### ***Hypermobility, Injury Prevention, and Rehabilitation in Musicians***

Hypermobility and movement dysfunctions of the CMC/MCP/wrist/elbow/shoulder became an interest of mine recently, as a high school dancer I treated last year for a lower extremity issue returned this year as a violinist with a CMC hypermobility and wrist movement dysfunction. (So much talent!) I found great articles on recognition of risk factors, prevention, and instrument-focused rehabilitation. I included one article on craniomandibular dysfunctions as the authors found a prevalence of co-existing upper extremity and spine dysfunctions. I was glad to see new research on identifying risk in young musicians and children. So interesting! Enjoy!

*Annette Karim, PT, DPT, OCS, FAAOMPT*

*Director of Dance Medicine, Evergreen Physical Therapy Specialists, Pasadena, CA*

Adib, N., K. Davies, et al. (2005). "Joint hypermobility syndrome in childhood. A not so benign multisystem disorder?" *Rheumatology (Oxford)* **44**(6): 744-750.

OBJECTIVES: Joint hypermobility (JH) or "ligamentous laxity" is felt to be an underlying risk factor for many types of musculoskeletal presentation in paediatrics, and joint hypermobility syndrome (JHS) describes such disorders where symptoms become chronic, often more generalized and associated with functional impairment. Clinical features are felt to have much in common with more severe disorders, including Ehlers-Danlos syndrome (EDS), osteogenesis imperfecta and Marfan syndrome, although this has not been formally studied in children. We defined the clinical characteristics of all patients with joint hypermobility-related presentations seen from 1999 to 2002 in a tertiary referral paediatric rheumatology unit. METHODS: Patients were identified and recruited from paediatric rheumatology clinic and ward, and a dedicated paediatric rheumatology hypermobility clinic at Great Ormond Street Hospital. Data were collected retrospectively on the patients from the paediatric rheumatology clinics (1999-2002) and prospectively on patients seen in

the hypermobility clinic (2000-2002). Specifically, historical details of developmental milestones, musculoskeletal or soft tissue diagnoses and symptoms, and significant past medical history were recorded. Examination features sought included measurements of joint and soft tissue laxity, and associated conditions such as scoliosis, dysmorphic features, cardiac murmurs and eye problems. RESULTS: One hundred and twenty-five children (64 females) were included on whom sufficient clinical data could be identified and who had clinical problems ascribed to JH present for longer than 3 months. Sixty-four were from the paediatric rheumatology clinic and 61 from the hypermobility clinic. No differences were found in any of the measures between the two populations and results are presented in a combined fashion. Three-quarters of referrals came from paediatricians and general practitioners but in only 10% was hypermobility recognized as a possible cause of joint complaint. The average age at onset of symptoms was 6.2 yr and age at diagnosis 9.0 yr, indicating a 2- to 3-yr delay in diagnosis. The major presenting complaint was arthralgia in 74%, abnormal gait in 10%, apparent joint deformity in 10% and back pain in 6%. Mean age at first walking was 15.0 months; 48% were considered "clumsy" and 36% as having poor coordination in early childhood. Twelve per cent had "clicky" hips at birth and 4% actual congenital dislocatable hip. Urinary tract infections were present in 13 and 6% of the female and male cases, respectively. Thirteen and 14%, respectively, had speech and learning difficulties diagnosed. A history of recurrent joint sprains was seen in 20% and actual subluxation/dislocation of joints in 10%. Forty per cent had experienced problems with handwriting tasks, 48% had major limitations of school-based physical education activities, 67% other physical activities and 41% had missed significant periods of schooling because of symptoms. Forty-three per cent described a history of easy bruising. Examination revealed that 94% scored  $\geq 4/9$  on the Beighton scale for generalized hypermobility, with knees (92%), elbows (87%), wrists (82%), hand metacarpophalangeal joints (79%), and ankles (75%) being most frequently involved. CONCLUSIONS: JHS is poorly recognized in children with a long delay in the time to diagnosis. Although there is a referral bias towards joint symptoms, a surprisingly large proportion is associated with significant neuromuscular and motor development problems. Our patients with JHS also show many overlap features with genetic disorders such as EDS and Marfan syndrome. The delay in diagnosis results in poor control of pain and disruption of normal home life, schooling and physical activities. Knowledge of the diagnosis and simple interventions are likely to be highly effective in reducing the morbidity and cost to the health and social services.

Foxman, I. and B. J. Burgel (2006). "Musician health and safety: Preventing playing-related musculoskeletal disorders." AAOHN J **54**(7): 309-316.

Musicians are exposed to high-risk musculoskeletal activities such as repetition, hours of exposure, and awkward postures when playing instruments. These activities may result in playing-related musculoskeletal disorders. Musicians often work part-time or seasonally or are self-employed. Thus, they may be uninsured or underinsured and may delay seeking care for these painful and potentially disabling conditions. Prevention of playing-related musculoskeletal disorders includes identification of both intrinsic (e.g., musician strength and flexibility) and extrinsic (e.g., musician posture while playing an instrument) factors involved in the interface between musicians and their instruments and the playing environment (e.g., rest breaks or hours of practice). Student occupational health nurse practitioners in this pilot project performed outreach and comprehensive screening and treatment for a small group of musicians diagnosed as having playing-related musculoskeletal disorders. Tendon and nerve gliding exercises were a key component of the treatment plan.

Kok, L. M., T. P. Vlieland, et al. (2013). "A comparative study on the prevalence of musculoskeletal complaints among musicians and non-musicians." BMC Musculoskelet Disord **14**: 9.

**BACKGROUND:** Research comparing the frequency of musculoskeletal complaints between musicians and non-musicians is scarce. The aim of this study was to compare the prevalence of musculoskeletal complaints between musicians and non-musicians. **METHODS:** A cross-sectional study in 3215 students from three music academies (n = 345) and one medical school (n = 2870) in The Netherlands was performed, using an electronic questionnaire. The questionnaire included socio-demographic characteristics, use of music instruments and the occurrence of musculoskeletal complaints in six body regions. Questions were related to musculoskeletal complaints over the last twelve months and at the time of the questionnaire. Chi-square, t-tests and Kruskal-Wallis tests were used for comparison between the two groups. The association between musculoskeletal complaints and possible predictors was analyzed using a logistic and Poisson regression. **RESULTS:** Eighty-seven music academy students and 503 medical students returned the questionnaire, of which respectively eighty-three and 494 were included in the study. Seventy-four music academy students (89.2%) reported one or more musculoskeletal complaints during the last twelve months, compared to 384 (77.9%) medical students (p = 0.019). Moreover 52 music academy students (62.7%) and 211 medical students (42.7%) reported current musculoskeletal complaints (p = 0.001). The odds ratio (OR) for the development of musculoskeletal complaints during the last twelve months in music academy students versus medical students is 2.33 (95% CI 1.61-3.05, p = 0.022). The OR at the time of the questionnaire is 2.25 (95% CI

1.77-2.73,  $p = 0.001$ ). The total number of complaints have been modeled by employing a Poisson regression; the results show that non-musicians have on average less complaints than musicians ( $p = 0.01$ ). The adjusted means are 2.90 (95% CI 2.18-3.63) and 1.83 (95% CI 1.63-2.04) respectively for musicians and non-musicians. Regarding the localization of complaints, music academy students reported more complaints concerning the right hand, wrists, left elbow, shoulders, neck, jaw and mouth in contrast to medical students. CONCLUSIONS: Musculoskeletal complaints are significantly more common among musicians compared to non-musicians, mainly due to a higher number of upper extremity complaints.

Murray, K. J. (2006). "Hypermobility disorders in children and adolescents." Best Pract Res Clin Rheumatol **20**(2): 329-351.

It is well recognized that many if not most children and adolescents attending paediatric rheumatology clinics will have a non-inflammatory origin for their complaints or disorder. Mechanical causes are frequently identified, and hypermobility or ligamentous laxity of joints is increasingly recognized as an aetiological factor in the presentation. Such conditions include 'growing pains', recurrent lower-limb arthralgia, anterior knee pain syndromes, and back pain. Studies of significant cohorts of such patients have now been published supporting the link of ligamentous laxity to particular symptom complexes. However, much disagreement remains as to the validity of hypermobility as an aetiological factor. What seems clear is that not all hypermobile individuals will be symptomatic or indeed possibly have any risk for specific musculoskeletal disorders in later life. Screening tools such as the Beighton score are likely to be inadequate in many paediatric populations. Along with increasing recognition of these disorders in childhood and adolescence has been the development of a multidisciplinary management approach, which usually involves predominantly allied health professionals such as podiatrists, physiotherapists and occupational therapists. The challenge remains to interpret symptoms correctly as being related to the hypermobility and to predict why such children become symptomatic. The answer is likely to involve physiological and psychosocial factors. In addition, early identification and modification of risk factors may have major implications for subsequent prevalence of many adult medical disorders such as low back pain, chronic pain syndromes and degenerative osteoarthritis.

Nolet, R. (2013). "Virtuoso hands." Clin Rheumatol **32**(4): 435-438.

This article discusses what it means for the hands to play a musical instrument. It gives an impression of the time a musician spends practising and performing. Hand function is discussed by instrument, and an explicit description is given of technical aspects such as the position of a violinist's



fingers on the strings. Furthermore, individual differences and the influence of composers are discussed. Finally, the warm-up and the psychological burden on the musician are examined.

O'Brien, V. H. and M. R. Giveans (2013). "Effects of a dynamic stability approach in conservative intervention of the carpometacarpal joint of the thumb: a retrospective study." *J Hand Ther* **26**(1): 44-51; quiz 52.

STUDY DESIGN: Retrospective cohort. INTRODUCTION: Conservative intervention of carpometacarpal joint (CMC) thumb pain, caused by osteoarthritis and ligament laxity, is frequently seen in hand therapy. Traditional intervention for pain and disability reduction includes orthoses, exercises, and joint protection education. The literature on conservative management is unclear which design or program of exercises create an effective result. Results of a conservative dynamic stability interventional model for thumb pain are presented as a design which positively effects pain and disability. PURPOSE OF THE STUDY: The purposes were to primarily investigate change in pain and disability in persons with CMC pain in a dynamic stability modeled approach to intervention, and secondarily, to assess the average number of visits and the duration of total visits in this model. METHODS: A retrospective chart review was completed on 35 charts of those seen at a multicenter hand therapy clinic. The pain and disability scores from the QuickDASH were used as outcome measures. RESULTS: The average group pain and disability scores improved by 17.9% ( $p < .01$ ) and 19.3% ( $p < .01$ ) respectively, with average individual disability improvement of 15.7%, which is greater than the accepted MCID. The average patient visits were 2.37 over an average range of 44.5 days. The group demographics match current literature: 31 females to 4 males, with average age of 58 years (range of 30-82 years). CONCLUSION: Significant reduction in pain and disability is noted with a conservative dynamic stability modeled approach to intervention, with information on average visits and duration in this model of care for individuals with thumb pain at the CMC joint. LEVEL OF EVIDENCE: 4.

Pascarelli, E. F. and Y. P. Hsu (2001). "Understanding work-related upper extremity disorders: clinical findings in 485 computer users, musicians, and others." *J Occup Rehabil* **11**(1): 1-21.

Four hundred eighty five patients whose chief complaints were work related pain and other symptoms received a comprehensive upper-body clinical evaluation to determine the extent of their illness. The group had a mean age of 38.5 years. Sixty-three percent of patients were females. Seventy percent were computer users, 28% were musicians, and 2% were others engaged in repetitive work. The time between the onset of symptoms and our initial visit ranged from 2 weeks to over 17 years. A majority sought care within 30 months with the greatest number of them

seeking care before 12 months. Fifty nine percent of subjects were still working when seen despite increasing pain and symptoms such as weakness, numbness, tingling, and stiffness. Following a history, a physical assessment utilizing commonly employed clinical tests were performed including evaluation of joint range of motion, hyperlaxity, muscle tenderness, pain, strength, and imbalance. Neurologic tests included Tinel's sign performed in wrist, elbow, tricipital sulcus, and neck and tests for thoracic out syndrome (TOS). Specific tests such as Finkelstein's test for deQuervain's tenosynovitis, Phalen's test for carpal tunnel syndrome and grip strengths were included in the examination protocol. Significant findings included postural misalignment with protracted shoulders (78%), head forward position (71%), neurogenic TOS (70%), cervical radiculopathy (0.03%), evidence of sympathetic dysfunction (20%), and complex regional pain syndrome (RSD) (0.6%). Hyperlaxity of fingers and elbows was found in over 50%, carpal tunnel syndrome in 8%, radial tunnel syndrome in 7%, cubital tunnel in 64%, shoulder impingement in 13%, medial epicondylitis in 60%, lateral epicondylitis in 33%, and peripheral muscle weakness in 70%. We conclude that despite initial presentation distally, work-related upper-extremity disorders are a diffuse neuromuscular illness with significant proximal upper-body findings that affect distal function. While neurogenic TOS remains a controversial diagnosis, the substantial number of patients with positive clinical findings in this study lends weight to the concept that posture related neurogenic TOS is a key factor in the cascading series of physical events that characterize this illness. A comprehensive upper-body examination produces findings that cannot be obtained through laboratory tests and surveys alone and lays the ground work for generating hypotheses about the etiology of work related upper-extremity disorders that can be tested in controlled investigations.

Quarrier, N. F. (2011). "Is hypermobility syndrome (HMS) a contributing factor for chronic unspecific wrist pain in a musician? If so, how is it evaluated and managed?" *Work* **40**(3): 325-333.

**OBJECTIVES:** The musician complaining of chronic pain commonly presents with subtle and complicated findings. Joint hypermobility is common in these individuals. The diagnosis of joint hypermobility syndrome (HMS) does not merely involve joint laxity, but connective tissue impairment throughout the body as well as perhaps involving the neurological system. As the aging process gradually reduces joint laxity, chronic pain and various impairments may linger. This report investigates HMS as it relates to a case study involving a musician suffering with chronic joint pain and HMS. **METHODS:** Literature review and case description. **RESULTS:** HMS involves more than just joint laxity and may be the cause of various chronic pain dysfunctions. The prognosis for

recovery from HMS is poor, but the education and psychological aspect is extremely beneficial to the patient's health and well-being.

**CONCLUSIONS:** This case report identified a musician with CUWP and HMS. Joint hypermobility syndrome does not merely involve joint laxity, but involves connective tissue impairment throughout the body as well as perhaps involving the body's neurological system. Joint hypermobility is common in musicians.

Remvig, L., D. V. Jensen, et al. (2007). "Epidemiology of general joint hypermobility and basis for the proposed criteria for benign joint hypermobility syndrome: review of the literature." J Rheumatol **34**(4): 804-809.

**OBJECTIVE:** This literature review of generalized joint hypermobility (GJH) syndromes discusses information regarding sex-, age-, and race-related factors from publications that specifically document validated GJH criteria. **METHODS:** We present an analysis of criterion-referenced connections that identify similarities among major and minor clinical criteria that identify both GJH and benign joint hypermobility syndrome (BJHS). In our search, we found considerable empirical evidence that supports an increased prevalence of hypermobility among children, women, and certain racial groups. Two commonly used clinical assessment tools, the Carter and Wilkinson criteria ( $\geq 3$  positive tests out of 5) and the Beighton method ( $\geq 4$  positive tests out of 9), are the sources of these data. BJHS is diagnosed through a set of major and minor criteria - a combination of symptoms and objective findings -- that include arthralgia, back pain, spondylosis, spondylolysis/spondylolisthesis, joint dislocation/subluxation, soft tissue rheumatism, marfanoid habitus, abnormal skin, eye signs, varicose veins or hernia or uterine/rectal prolapse. **RESULTS:** Clinically, there is some evidence that arthralgia, the proposed BJHS major criterion, is a major component of alleged hypermobility-related problems. In contrast, there is no clear evidence that proposed BJHS minor diagnostic criteria are associated with hypermobility-related problems. An empirical correlation between hypermobility and osteoarthritis is possible, but so far unproven. There are no randomized controlled studies regarding effects of existing treatments. **CONCLUSION:** Generalized hypermobility is both sex- and age-related. Racial differences are also identifiable. The existence of BJHS can be accepted using present criteria.

Steinmetz, A., H. Moller, et al. (2012). "Playing-related musculoskeletal disorders in music students-associated musculoskeletal signs." Eur J Phys Rehabil Med **48**(4): 625-633.

**BACKGROUND:** Pain and overuse are common problems for musicians. Up to 80% of professional musicians suffer from playing-related musculoskeletal disorders (PRMD). The prevalence rate in music students

is very high as well. Sufficient data on the underlying musculoskeletal dysfunctions however is scarce. Additionally, the self-assessment of health in musicians seems to differ compared to non-musicians, which might influence their attitudes concerning preventive strategies. AIM: Evaluation of frequency of PRMD in music students, investigation of signs and symptoms in music students compared to non-music controls, comparison of self-reported health and well-being between the two groups. DESIGN: Prospective, cross-sectional, case control, non-randomized. SETTING: Other (University volunteers). POPULATION: Music students in comparison to a non-music control group. METHOD: Musculoskeletal examination and questionnaire of 36 volunteers of a music university and 19 volunteer students of an university of education were analyzed. The total number of musculoskeletal dysfunctions and differences between the student groups were examined. The personal pain and health self-rating were compared between music and non-music students. RESULTS: Eighty one percent of musicians experienced PRMD. Musicians experienced 6.19 pain regions on average compared to 4.31 of non-musicians. Musicians experiencing PRMD reported significantly ( $P<0.05$ ) more pain locations than musicians without. Music students presented with nearly the double amount (8.39 versus 4.37) of musculoskeletal dysfunctions per person compared to the non-music control group. Nevertheless, musicians significantly ( $P<0.05$ ) rated their health more positively than the controls. CONCLUSION: Musicians presented with more pain regions and a higher amount of musculoskeletal dysfunctions. Further studies evaluating the clinical relevance and their role in the development of PRMD are warranted. CLINICAL REHABILITATION IMPACT: Screening of musicians for musculoskeletal dysfunction may identify those musicians at increased risk. Early treatment may prevent PRMD in musicians. Additional research is needed to confirm our hypothesis.

Steinmetz, A., A. Zeh, et al. (2014). "Symptoms of craniomandibular dysfunction in professional orchestra musicians." *Occup Med (Lond)* **64**(1): 17-22.

Background Up to 80% of professional musicians are affected by playing-related musculoskeletal disorders, but data regarding the frequency of craniomandibular dysfunction (CMD) in professional orchestra musicians is scarce. Aims To evaluate the frequency of CMD and its relation to musculoskeletal pain in various body regions. Methods A questionnaire-based survey approach assessing CMD symptoms and musculoskeletal pain in professional orchestra players was adopted. Relative prevalence rates and prevalence ratios for different instrument groups were estimated. Results A total of 408 musicians completed the questionnaire (response rate 57%). Playing-related pain in the teeth or jaw was reported by 19-47% of musicians and TMJ pain by 15-34%, depending on the instrument

group. Current pain in the face indicating a painful CMD was reported in 6-10% and related symptoms such as teeth grinding in 25-34%, jaw clenching in 33-42% and jaw locking in 11-18% of musicians. Females were 2.4 times (95% confidence intervals (CI) 1.49-3.84) more likely to report having had orofacial pain within the last month. Musicians reporting orofacial pain within the last month were 4.8 times (95% CI: 2.83-8.02) more likely to report pain in the neck and 2.5-3.8 times ( $P < 0.05$ ) more likely to report pain in other body regions, including shoulders, right wrist, left fingers and the thoracic and lumbar spine. Conclusions Symptoms suggesting CMD were common in this study of professional orchestra musicians and were associated with pain in the neck, shoulder and hands. There is a need to enhance awareness of CMD to optimize early medical diagnosis and treatment.

Warrington, J. (2003). "Hand therapy for the musician: instrument-focused rehabilitation." *Hand Clin* **19**(2): 287-301, vii.

Extraordinary hand therapy goals and treatment approaches are required for the professional musician. Rehabilitation using the instrument includes early return to modified playing, instrument-specific exercises, sensory reeducation and manual therapy, improving musical fitness, a multidisciplinary team approach, and instrument modifications and splinting when necessary. Education regarding good practice habits is essential to avoid secondary problems on return to full playing. This treatment approach is valuable following traumatic injury, for degenerative conditions, and for nonspecific wrist and hand pain.

Zander, M. F., E. Voltmer, et al. (2010). "Health promotion and prevention in higher music education: results of a longitudinal study." *Med Probl Perform Art* **25**(2): 54-65.

**OBJECTIVES:** Music-related symptoms can already be found among student musicians during their years of university training. The goals of the present study were to ascertain the state and developmental course of the student musicians' health and to test the effectiveness of a preventive curriculum given to student musicians during their first two semesters at university. **METHODS:** Within a longitudinal, observational study, we assessed students' psychological and physical health during the first 2 years of university training. We compared data from the group of students who had followed the prevention program (intervention group, IG,  $n = 144$ ) with data of a comparison group (CG,  $n = 103$ ) of students who had not followed the program. Using standardized questionnaires, we measured physical and psychological symptoms as well as health behavior in a sequential plan (duration, 3.5 yrs). **RESULTS:** Student musicians ( $n = 247$ ) showed elevated ratings in psychological and physical health in comparison with nonmusicians of the same age. These ratings decreased

at the end of the students' second year. The prevention program had a preventive effect on the students' psychological health: while IG students remained stable in their performance and powers of concentration, CG students got worse in those same areas. However, the prevention program did not reduce physical symptoms. In comparison with their younger colleagues, upper-level students took more courses in body-oriented methods, relaxation, and mental techniques, which focus on preventive measures for musicians. CONCLUSION: At present, the study offers evidence supporting the use of the prevention curriculum for young musicians. In higher music education, preventive education has a positive impact on students' performance and their attitude toward health. The preventive curriculum does not have an effect on preexisting physical symptoms, and those symptoms related to the students musicians' activity should rather be treated in an additional therapeutic setting.



Remember, PASIG membership is free to all orthopaedic section members.

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