



PERFORMING ARTS

SPECIAL INTEREST GROUP



ORTHOPAEDIC SECTION
AMERICAN PHYSICAL THERAPY ASSOCIATION



American Physical Therapy Association
The Science of Healing. The Art of Caring.

PASIG MONTHLY CITATION BLAST: No.71

May 2012

Dear Performing Arts SIG members:

Please welcome Dr. Tom McPoil, PT, PhD, FAPTA, our new APTA-Orthopaedic section board liaison to the Performing Arts Special Interest Group. Welcome, Tom!

May is a great month for collaboration and planning:

Several of our members have indicated interest in participating in a multicenter case series on rehabilitation of dancers with a focus on the deep rotators of the hip. Please email me if you would like to work on this collaboration, and I will pass on your contact information.

It is time to think of your poster and platform presentations, with summer as a great time to assemble and submit your work. There are wonderful PASIG members who have volunteered to help you with the process, if you require any assistance. Email me!

For our May 2012 Monthly Citation Blast, Dr. Janice Ying, PT, DPT, has compiled abstracts on the topic, "Prevalence of playing-related injuries amongst instrumental musicians."

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).

Please consider compiling and contributing a brief summary of Performing Arts-related abstracts for citation blast this year. It's easy to do, and a great way to become involved with PASIG!

Warm regards,

Annette

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PERFORMING ARTS CONTINUING EDUCATION AND CONFERENCES

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

Westside Dance Physical Therapy, Dance Medicine Practicum. Module III: Hip, Pelvis and Lumbar Spine, May 18th-20th, 2012. Module IV: Thorax, Cervical Spine and Shoulder Girdle, June 1st-3rd, 2012.

<http://westsidedancept.com/education/dance-medicine-practicum/>

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>

Dance USA 2012 Annual Conference. San Francisco, CA. June 27-30, 2012.

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

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>

Prevalence of playing-related injuries amongst instrumental musicians

Working with instrumental musicians can be quite daunting because playing techniques and positions vary so much from instrument to instrument and from player to player. The types of injuries encountered can also be as diverse as the instruments themselves. As physical therapists working with performing artists, we have the unique advantage of being experts on analyzing human movement. It is imperative that we are not only able to obtain a thorough and musician-specific patient history, but to also accurately identify key impairments and contributing playing-related risk factors.

Perhaps one of the most influential studies in the field of music medicine was one conducted in 1987 by the International Conference of Symphony and Opera

Musicians (ISCOM). A total of 2,212 musicians among 48 symphony orchestras participated; it was, and still is, the largest-scale prevalence study on professional musicians to this date. Since then, more prevalence studies have been conducted. What is most alarming is that many of the studies, though analyzing various components of musician health, continue to report high rates of playing-related musculoskeletal injuries amongst their respective populations. In the same study by ICSOM, various treatments utilized for treating severe musculoskeletal problems in the left hand were identified. Of the 23 different interventions listed, physical therapy had one of the highest success ratios (82%), only coming next to surgery (94%) and rest (84%). What this means for physical therapists, is that there is a strong potential for us to come into the forefront of music medicine. We can use the data collected by the dozens of prevalence studies on musician-related injuries to identify areas of greatest concern for future study, develop effective musician-specific treatment interventions and injury prevention programs, and increase awareness of playing-related injuries among medical practitioners and musicians alike.

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Bragge, P., A. Bialocerkowski, et al. (2006). "A systematic review of prevalence and risk factors associated with playing-related musculoskeletal disorders in pianists." Occupational Medicine (Oxford) **56**(1): 28-38.

BACKGROUND: Playing-related musculoskeletal disorders (PRMDs) are a recognized problem amongst instrumental musicians. Although pianists are prominent in data regarding prevalence of PRMDs, there is poor understanding of piano-specific risk factors associated with PRMDs.

AIM: To synthesize published literature on the prevalence of and risk factors associated with PRMDs in pianists.

METHODS: Thirty-eight databases were searched. Eligible studies were those investigating prevalence of or risk factors associated with PRMDs in pianists, using an appropriate methodology according to a hierarchy of evidence.

Information regarding study population, operational definition of PRMD, risk factors investigated, statistical tests used and outcomes was extracted and narratively synthesized for all eligible papers above an arbitrarily chosen quality score.

RESULTS: The literature search identified 482 citations. Fifty-two papers were ranked in a hierarchy of evidence; 12 were eligible for evaluation using a quality assessment tool. Common methodological limitations included sampling/measurement biases, inadequate reporting of reliability/validity of outcome measures, lack of operational definition of PRMD and no statistical significance testing. Prevalence rates for PRMDs in pianists varied widely (26–93%). Four authors demonstrated statistically significant risk factors; however, no authors combined a clear operational definition of PRMD with statistically

established risk factors. There was no consensus between authors regarding risk factors.

CONCLUSIONS: Current evidence does not provide sufficient information regarding prevalence of and risk factors associated with PRMDs in pianists. Future studies should provide an operational definition of PRMD, use valid, reliable measurement tools, utilize a prospective cohort study design and perform appropriate statistical tests.

Brandfonbrener, A. G. (2009). "History of playing-related pain in 330 university freshman music students." Medical Problems of Performing Artists **24**(1): 30-36.

To understand what factors may contribute to the problems experienced by conservatory/music school students, we surveyed incoming freshman music students about their history of playing-related pain from four consecutive entering classes at a midwestern university school of music. A total of 330 students (46% male, 54% female) participated in the study and completed a 22-item questionnaire. Seventy-nine percent of students reported a history of playing-related pain. Pain frequency varied by instrument class, ranging from 61% among voice students to 100% for percussionists, but for strings, keyboards, woodwinds, and brass players, it was consistently 84 to 87%. There was no significant association between frequency of pain history and gender (76% for males vs 81% for females), years of instrument study, participation in regular exercise, or occurrence of performance anxiety. Although this study was unable to identify factors linked to playing-related pain, it does indicate that in a population of incoming freshmen, who are young people presumably in otherwise good health and with a "clean slate," the majority had already encountered music-induced pain as high school students or younger.

Bruno, S., A. Louriço, et al. (2008). "Playing-related disabling musculoskeletal disorders in young and adult classical piano students." International Archives of Occupational and Environmental Health **81**(7): 855-860.

OBJECTIVE: To determine the prevalence of instrument-related musculoskeletal problems in classical piano students and investigate piano-specific risk factors.

METHODS: A specially developed four parts questionnaire was administered to classical piano students of two Apulian conservatories, in southern Italy. A cross-sectional design was used. Prevalences of playing related musculoskeletal disorders (MSDs) were calculated and cases were compared with non-cases.

RESULTS: A total of 195 out of the 224 piano students responded (87%). Among 195 responders, 75 (38.4%) were considered affected according to the pre-established criteria. Disabling MSDs showed similar prevalence rates for neck (29.3%), thoracic spine (21.3%) and upper limbs (from 20.0 to 30.4%) in the affected group. Univariate analyses showed statistical differences concerning mean age, number of hours per week spent playing, more than 60 min of continuative playing without breaks, lack of sport practice and acceptability of "No pain, no gain" criterion in students with music-related pain compared with pianists

not affected. Statistical correlation was found only between upper limbs diseases in pianists and hand sizes. No correlation with the model of piano played was found in the affected group. The multivariate analyses performed by logistic regression confirmed the independent correlation of the risk factors age, lack of sport practice and acceptability of "No pain, no gain" criterion.

CONCLUSION: Our study showed MSDs to be a common problem among classical piano students. With variance in several studies reported, older students appeared to be more frequently affected by disabling MSDs and no difference in the prevalence rate of the disorders was found in females.

Burkholder, K. R. and A. G. Brandfonbrener (2004). "Performance-related injuries among student musicians at a specialty clinic." Medical Problems of Performing Artists **19**: 116-122.

The purpose of this study was to determine the relative frequency of performance-related injuries in patients age 18 and younger who presented to a specialized performing arts clinic. A total of 314 student musicians age 18 and younger were seen at the specialty clinic between its inception in 1985 and November 2002. Retrospective chart review and analysis of the resulting data were conducted. Information collected included presenting complaint, problem location, and diagnosis. Data were analyzed with respect to gender, instrument played, and ligamentous laxity. The upper extremity was the most common injury location. The lateralization and anatomic location of the injuries were influenced by the instrument played. The most frequent problems were musculoskeletal pain syndrome and excessive muscle tension. Lack of physical conditioning and poor instrumental technique also were commonly noted. Ligamentous laxity of the wrist and fingers was found in a proportion higher than in that of the general population and was related to the number and the type of physical diagnoses made. Laxity was more common in girls. Other diagnoses that were more frequent among female musicians included lack of conditioning, intrinsic hand muscle weakness, and scoliosis. In boys, carpal tunnel syndrome and tendinitis were more common. The findings suggest that young age is not a protective factor against playing-related injuries. Physicians caring for musicians in this age group should have an awareness of the problems and risk factors related to playing musical instruments.

Cayea, D. and R. A. Manchester (1998). "Instrument-specific rates of upper-extremity injuries in music students." Medical Problems of Performing Artists **13**: 19-25.

The instrument-specific injury rates of students at a university-level music school were calculated from data collected over 14 academic years, 1982–83 through 1995–96. During this period, 513 performance majors presented to their university's health service with performance-related upper-extremity injuries. The overall injury rate (number of injuries per 100 performance major student years) was 8.3. The instruments were divided into low-, medium-, and high-rate tertiles

based on their associated injury rates. Instruments in the low tertile had a rate that fell between 0 and 5.9. These instruments included all the brass instruments, as well as the oboe and bassoon. Medium-injury-rate instruments had a rate between 6.0 and 11.9 and included all the bowed string instruments, the saxophone, clarinet, organ, flute, and percussion.

The high-injury-rate instruments (12.0 to 18.0) included the piano, guitar, and harp. Women had a higher overall injury rate than men (8.9 vs 5.9). Since there have been no studies to date that have examined the instrument-specific injury rates of a broad range of instruments, some broad comparisons are made with studies that examined injury-associated prevalence among groups of instruments.

Fishbein, M., S. E. Middlestadt, et al. (1988). "Medical problems among ICSOM musicians: overview of a national survey." Medical Problems of Performing Artists **3**: 1-8.

A survey of 48 professional symphony orchestras was conducted by the International Conference of Symphony and Opera Musicians (ICSOM). The main purpose of the survey was to determine the prevalence of medical problems among professional orchestra musicians. A total of 2,212 musicians (55% response rate) responded to a questionnaire, which asked the musicians to identify medical history, past musculoskeletal problems, injury location, symptoms, diagnoses and medical treatments sought. Musicians were then asked to rate the severity of the problems identified, as well as the effectiveness of the treatments that they had tried. 82% of the ICSOM musicians reported experiencing a medical problem, and 76% listed at least one problem as severe in terms of its effects on their performance. Of those musicians listing a 'severe' problem, 14% reported one severe problem, 14% listed two, 12% listed three, and 36% listed four severe problems. Females were more prone to medical problems and those musicians between 35-45 years old were more likely to experience an injury. Medical problems were most prevalent in string players (84%). Of the 34 physical locations listed on the survey, 20% of musicians reported problems with the right shoulder; 20% with the left shoulder; 21% with the right neck; 22% with the left neck; 22% with the lower back; 16% of the left finger (not specified). Treatments for those musicians suffering from severe left hand musculoskeletal problems varied. Most commonly, musicians resorted to rest (37%), but also used modalities such as heat (32%); prescription medication (28%); ice (19%) and chiropractic manipulation (15%), and physical therapy (13%). Success ratios for these treatments were reported: Rest (84%); heat (47%); prescription medication (45%); ice (30%); chiropractic manipulation (50%); physical therapy (82%). Given the proportion of professional musicians reporting medical problems severe enough to affect performance, there can be little doubt that music medicine is a field that deserves serious attention from health professionals. There is an urgent need for techniques to treat and prevent a variety of occupation-related medical problems.

Leaver, R., E. C. Harris, et al. (2011). "Musculoskeletal pain in elite professional musicians from British symphony orchestras." Occupational Medicine (Oxford) **61**(8): 549-555.

BACKGROUND: Professional musicians have high rates of musculoskeletal pain, but few studies have analysed risks by work activities or the psychosocial work environment.

AIMS: To assess the prevalence and impact of musculoskeletal pain, and its relation to playing conditions, mental health and performance anxiety, in musicians from leading British symphony orchestras.

METHODS: Musicians from six professional orchestras completed a questionnaire concerning their orchestral duties and physical activities at work, mental health (somatizing tendency, mood, demand, support and control at work, performance anxiety) and regional pain in the past 4 weeks and past 12 months. Prevalence rates were estimated by anatomical site and associations with risk factors assessed by logistic regression.

RESULTS: Responses were received from 243 musicians (51% of those approached), among whom 210 (86%) reported regional pain in the past 12 months, mainly affecting the neck, low back and shoulders. Risks tended to be higher in women, in those with low mood, and especially in those with high somatizing scores. Only weak associations were found with psychosocial work stressors and performance anxiety. However, risks differed markedly by instrument category. Relative to string players, the odds of wrist/hand pain were raised 2.9-fold in wind players, but 60% lower in brass players, while the odds of elbow pain were 50% lower among wind and brass players.

CONCLUSIONS: Musculoskeletal pain is common in elite professional musicians. A major personal risk factor is somatizing tendency, but performance anxiety has less impact. Risks differ substantially by instrument played, offering pointers towards prevention.

Paarup, H. M., J. Baelum, et al. (2011). "Prevalence and consequences of musculoskeletal symptoms in symphony orchestra musicians vary by gender: a cross-sectional study." BMC Musculoskeletal Disorders **12**(1): 223.

BACKGROUND: Musculoskeletal symptoms are common in the neck, back, and upper limbs amongst musicians. Playing-related musculoskeletal disorders have been found to range from 32% to 87% with a tendency for female musicians to have more problems than males. Studies of musculoskeletal problems in instrumentalists have generally involved pre-professional musicians or populations comprising musicians of different levels. The objective of this study was therefore to investigate the prevalence, duration and consequences of musculoskeletal symptoms in professional symphony orchestra musicians.

METHODS: A cross-sectional questionnaire study. The study population comprised of 441 musicians from six Danish symphony orchestras; 342 (78%) completed the questionnaire.

RESULTS: During the last year 97% of the women and 83% of the men

experienced symptoms in at least one of nine anatomic regions (neck, upper and lower back, shoulders, elbows, and hands and wrists). 86% of the women and 67% of the men experienced symptoms for more than seven days, while 63% of the women and 49% of the men had symptoms for more than 30 days.

Woodwind players had a lower risk for musculoskeletal symptoms and a lower risk for the consequences. Among consequences were changed way of playing, reported by 73% of the musicians, difficulty in daily activities at home, reported by 55%, and difficulty in sleeping, reported by 49%. Their health behaviour included taking paracetamol as the most used analgesic, while physiotherapists and general practitioners were reported as the most consulted health care professionals concerning musculoskeletal problems. Results regarding symptoms in six anatomic regions were compared to results for a sample of the general Danish workforce. Symptoms were more frequent in musicians and lasted longer than in the general workforce. This applied to both genders.

CONCLUSIONS: Within the last year most symphony orchestra musicians experienced musculoskeletal symptoms in the neck, back or upper extremities. The symptoms impacted on their level of function in and outside work and were reflected in their health behaviour. Generally women had a higher risk than men and woodwind players a lower risk than other instrumentalists. Finally, symptoms were more frequent and lasted longer in the musicians than in the general workforce.

Ranelli, S., L. Straker, et al. (2008). "Prevalence of playing-related musculoskeletal symptoms and disorders in children learning instrumental music." Medical Problems of Performing Artists **23**: 178-185.

Musculoskeletal problems related to playing musical instruments have long been identified with adults, but little is known about their development during childhood. What evidence does exist has not adequately considered risk factors, in particular the effects of gender and age. A cross-sectional questionnaire study gathered data from 731 children enrolled in the instrumental music programs of government primary and secondary schools in Perth, Western Australia. This study, the first in a series investigating risk factors, established the prevalence of playing-related musculoskeletal problems, both symptoms (PRMS) and disorders (PRMD), and the association with gender and age. In this group, 67% of children reported ever experiencing PRMS, with 56% reporting symptoms at least monthly. Females were more likely (odds ratio [OR] 1.5, $p = 0.03$) to experience symptoms and older children were more likely to have ever experienced symptoms ($p < 0.001$). Thirty percent reported the experience of a PRMD, being unable to play their instrument as usual. Females (OR 1.5, $p = 0.035$) and older children ($p = 0.001$) again were more likely to report the experience of a disorder. For children having reported the experience of a PRMS within the last month, 5% took medication to relieve the problem and 4% visited a health professional to seek advice for the problem.

Zaza, C. (1998). "Playing-related musculoskeletal disorders in musicians: a

systematic review of incidence and prevalence." CMAJ. Canadian Medical Association journal **158**(8): 1019-1025.

BACKGROUND: Work-related musculoskeletal disorders cause pain, disability and loss of employment for many workers, including musicians. Although performing arts medicine is a growing field, the health problems of musicians remain under-recognized and under-researched. Therefore, the author undertook a systematic review of published information on the incidence and prevalence of playing-related musculoskeletal disorders (PRMDs) in classical musicians.

METHODS: Seven databases were searched for the period 1980 to 1996. The main textbook and performing arts medicine journals were searched manually, as were reference lists of all relevant papers. The author also contacted individuals familiar with the literature of performing arts medicine. Studies were included for review if they reported PRMD incidence or prevalence in classical musicians. Of the 24 studies identified, 18 cross-sectional surveys and cohort studies were reviewed. The author subjectively assessed the studies using criteria modified from an existing evaluation scale and used 4 criteria for data combination. On the basis of prevalence values from the eligible studies, χ^2 tests for heterogeneity were performed.

RESULTS: Only one study estimated PRMD incidence. Ten of the 17 prevalence studies were ineligible for data combination, because of low response rates and other methodological problems. In the 7 eligible studies, PRMD point prevalence ranged from 39% to 87% in adult musicians and from 34% to 62% in secondary school music students. The best estimates of PRMD prevalence were derived from the 3 studies that excluded mild complaints; these studies indicated that PRMD prevalence was 39% and 47% in adults and 17% in secondary school music students respectively. Statistical combination of data across studies within each demographic category was not possible.

INTERPRETATION: Available data indicate that the prevalence of PRMD in adult classical musicians is comparable to the prevalence of work-related musculoskeletal disorders reported for other occupational groups. Several recommendations for future research are outlined

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https://www.orthopt.org/surveys/membership_directory.php