


Stretching for Sonographers: A Literature Review of Sonographer- Reported Musculoskeletal Injuries

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Abstract

With increasing patient loads, many sonographers have found themselves scanning in pain; up to 90% of sonographers have experienced pain while scanning. In this literature review, the question is asked, **Are there any methods, such as stretching exercises, that a sonographer could personally implement to reduce or alleviate musculoskeletal injury?** The literature of interest was located using online databases including CINAHL, Medline, PubMed, and SAGE Publications. Themes included sonographer, injury, musculoskeletal, stretching, and exercise. The literature shows a clear pattern of work-related musculoskeletal injury for actively scanning sonographers, but it is clear that more research is needed in the area of musculoskeletal injury prevention and alleviation. Research reports and case studies were explored for benefits of stretching across a spectrum of disciplines; specifically absent are large-scale studies looking at the benefits of a stretching and exercise program, preferably one integrated into the daily work schedule.

Keywords

exercise, injury, musculoskeletal, sonographer, stretching

Introduction

The data collected over the past 15 years by numerous authors such as Baker et al,¹ Pike et al,² Muir et al,³ and Murphy and Russo⁴ show a clear pattern of sonographer work-related musculoskeletal (MSK) injury. **Indeed, the study by Baker et al¹ revealed that up to 90% of sonographers have intermittent pain while scanning, while the study by Pike et al,² conducted 10 years before the study by Baker et al, also showed that a large majority (81%) of the respondents experienced pain and discomfort since starting work as a sonographer.** Are there any methods, such as stretching exercises, that a sonographer could personally implement to reduce or alleviate MSK injury? The purpose of this literature review is to investigate this question and the hypothesis that by implementing a personal stretching routine, a sonographer can reduce or alleviate MSK pain related to scanning.

Methods

The literature search for this review was conducted using the database search tool available through the Moffett Library at the Midwestern State University (MWSU) website, as well as the SAGE publications database search tool. Individual databases included in the MWSU search were CINAHL, Medline, and PubMed. The *Journal of Diagnostic Medical Sonography (JDMS)* was

searched using the SAGE Publications search tool. (SAGE Publications hosts multiple journals online, one of which is JDMS.) Outside of the initial article by Pike et al,² only articles written since 2000 were included; the most recent article found was published in 2010. Search terms included sonographer, injury, musculoskeletal, stretching, and exercise. The Boolean limiter *AND* was used to filter results, generally by using sonographer *AND* one of the other search terms. Reference lists from identified articles were also used as an additional resource for other possible articles. Criteria for inclusion in this review included articles that were directly related to sonographer injuries in the workplace and methods to reduce or prevent injury. Nine articles were found that met the inclusion criteria.

Discussion

One of the earliest large-scale surveys to investigate the prevalence of MSK injuries among sonographers was the study by Pike et al.² Respondents were randomly selected

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from the membership directory of the American Registry of Diagnostic Medical Sonographers. The response rate was 32.8% of 3000 mailed surveys, which is considered a moderate response for this type of instrument. Eighty-one percent of all the respondents noted that they had pain and discomfort while scanning, and 97% of those believed the pain was related to scanning. In 2009, Baker et al¹ devised a follow-up survey to determine the current state of MSK injuries among sonographers. Their study also used random sampling and was large enough to be considered a representative sample of the general sonographer population with a good response rate (57% of 5200 surveys). The vast majority of the respondents (90.4%) reported pain while scanning patients. Allowing for small differences between the two studies, there was a marked increase over the 12-year period between samples in the prevalence of sonographers reporting pain while scanning (from 81% to 90%).

The types and areas of pain were similar between the studies, with the majority noting pain in the shoulders and neck. Shoulder pain was reported by 75% of the respondents and neck pain by 65% of the respondents in the study by Baker et al,¹ with the majority of the neck (56%) and shoulder (58%) pain described as "moderate." In the study by Pike et al,² 74% of the respondents reported shoulder pain and 75% reported neck pain. Wrist pain was reported by 50% and 65%, respectively, for the two studies. Both of these studies can be considered significant because of their size and methodology, which allowed for a large representative sample to be accurately portrayed. The studies reported by Muir et al³ and by Murphy and Russo⁴ are similar studies and reported similar results.

The literature regarding methods that may prevent or alleviate MSK injury is sparse. A study conducted by Christenssen⁵ attempted to measure the benefits of stretching as a means to reduce MSK injury and discomfort in echocardiographers. A stretching program designed by Bodyworks (the employee ergonomics team at Simon Fraser Health System) was used for the study and included stretches for the hand and forearm, cervical and lumbar spine, and upper trunk and shoulder girdle. Stretches were to be performed twice a day, and the results evaluated after 12 weeks. There were multiple stretches in each category, and the post-data indicated that the favored stretches were the thenar stretch, upper back stretch, chest stretch, and cervical spine extensor stretch. (See the appendix in Christenssen⁵ for stretch descriptions.) Limitations of the study included a small sample size and incomplete adherence to the study protocols, which made generalization to the larger echocardiographer and sonographer workforce impossible. However, the qualitative responses and interviews did show that all those who were in the experimental

stretching group felt that the exercises were beneficial and planned to implement at least some portions of the stretching program in their daily routines.

In a study conducted by Fenety and Walker,⁶ phone operators were tasked with performing stretches at set intervals to reduce MSK discomfort. Subjects performed a series of stretching exercises, range-of-motion exercises, and eye-relaxation exercises. Exercises were limited to the relatively short times during breaks, and subjects were asked to perform two repetitions of each exercise and to hold each stretch for 5 seconds only. The study found that the exercise breaks did reduce the growth of discomfort over time. The limitations of this study were similar to those of the Christenssen study in that it used a small sample size and had a limited window for performing the exercises; however, it also had positive personal comments from the subjects regarding the implementation of a daily stretching routine.

A literature review by da Costa and Vieira⁷ stated that the literature regarding stretching exercises to reduce MSK disorders was sparse and that only seven articles fulfilled their inclusion criteria: (1) investigate the use of stretching to prevent work-related MSK disorders; (2) have a group receiving only stretching as an intervention; (3) be peer reviewed; (4) be published in English; and (5) be published in full text. The articles reviewed covered a variety of workplace environments including computer work, manufacturing work and "heavy" work done by firefighters and military recruits. They found that stretching exercises had generally beneficial outcomes in reducing MSK discomfort, although the findings were mixed in some of the studies. They noted that most of the studies were of low methodological quality, similar to the studies cited above by Christenssen⁵ and Fenety and Walker.⁶ They further advised caution when using or implementing stretching routines as they may inadvertently suppress the awareness of the risks of the particular activity, resulting in further debilitating injury later. Also, if performed improperly, stretching may cause injury or worsen present injuries.

A personal case study was presented by Brown and Baker with a positive outcome for a sonographer who was suffering from work-related MSK injury.⁸ The case study described a clinical intervention that included conditioning exercises and stretching. The sonographer had been suffering with persistent upper spinal and limb pain and had reduced her working hours to 3 days per week. A multidisciplinary action plan was outlined for her including intramuscular stimulation, acupuncture, stretching exercises, and strength building exercises. Two months later, she was pain free at work and at home, and she planned to continue with the stretching and core building exercises.

Conclusion

With up to 90% of sonographers experiencing pain while scanning, taking a few short breaks during the working day to stretch could **make a significant difference in the quality of life for a sonographer.** The qualitative data from the Christenssen⁵ and Fenety and Walker⁶ studies indicated positive results with stretching exercises. In addition, the positive outcomes noted by da Costa and Vieira⁷ and the case study by Brown and Baker⁸ show the potential positive results of a targeted exercise program.

At present, no large-scale studies are available to determine the benefits of incorporating stretching exercises in the daily sonographer routine. Further more rigorous studies on a larger scale are warranted to better understand and correlate the positive outcomes mentioned in qualitative reports. **Stretching to reduce the instance of work-related MSK injury in sonographers should be an important research topic for many reasons,** not the least of which is the ability to take better care of ourselves and thus our patients.

Suggestions for Further Reading

For additional information, see the article by Julie Burnage, *Work Related Upper Limb Disorder: A Sonographer's Survival Guide*,⁹ which serves as an excellent guide for stretches and suggestions for sonographers to take control of their pain and scanning techniques.

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