



Editorial

Ergonomic solutions for dermatologists



- **What is known about ergonomics and work-related injury in regard to women and their families?**

- Surveys of work-related injury in dermatology show that women experience higher pain scores due to ergonomic strain.
- High rates of musculoskeletal disorders due to overexertion and repetitive injury have been shown within dermatology, and these disorders can affect quality of life and shorten career potential.

- **What is new information about ergonomics and work-related injury in regard to women and their families?**

- In collaboration with colleagues in physical therapy, the sites of highest rates of work-related injury were identified through a literature review, and specific recommendations were made to address these muscle groups.
- Regular strengthening exercises, stretches during the workday, and use of ergonomic tools can address high-stress muscles and decrease the chances of injury and disability.

The practice of dermatology often involves repetitive activities and static postures over long hours, which can lead to work-related musculoskeletal strain and injury. This risk is often exacerbated by less than ideal clinical tools and materials. Based on the high rate of musculoskeletal injury and disability within dermatology, [Bhatia et al. \(2017\)](#) suggested consistent ergonomic training beginning during residency and a formal ergonomic evaluation specific to our specialty. Recently, a review of ergonomic data revealed a paucity of dermatology-specific ergonomic information and solutions proposed compared with other procedural specialties ([Chan et al., 2020](#)). Herein, we provide a set of ergonomic solutions involving regular stretches and strengthening exercises, some of which may be performed during the workday. These will address the most injured areas for dermatologists based on existing data and observations by our colleagues in physical therapy.

Performing a large number of routine skin examinations requires less than ideal ergonomic positions for the physician. Dermatologic surgeons are at the highest risk within the field of dermatology because they spend 79% of their time standing. More than half of surveyed surgeons report that they continue to work

with pain so their work does not suffer ([Liang et al., 2012](#)). In a survey study of practicing Mohs surgeons, 65% reported neck pain, 63% lower back pain, and 61% shoulder pain ([Liang et al., 2012](#)). In total, >90% of Mohs surgeons experienced musculoskeletal strain. With the use of videotape analysis of dermatologic surgeons, almost all surgeons were observed with cervical spine flexion of >30° for long periods, which frequently leads to chronic neck disorders ([Esser et al., 2007](#)). This study also revealed chronic upper arm abduction and trunk flexion and suggested numerous positioning solutions to tackle many of these problem areas ([Esser et al., 2007](#)).

In addition to positioning, dermatologic surgeons must focus on strengthening overused muscles, stretching the adaptive and length-shortened opposing muscles, and setting up an ergonomic working environment. Specific static postures that involve the surgeon hunched over the patient with trunk and neck flexion lead to contraction of multiple muscle groups. Stretching of the pectoral, latissimus dorsi, hip flexors, and cervical spine may combat the risk of injury and strain ([Fig. 1](#)). These stretches may be completed during frequent breaks in long procedures or during task changes and ideally should be performed daily for 15 minutes.

Strengthening exercises should focus on an individual's rotator cuff and postural muscles, as well as scapular and spinal stabilizers. This allows for improved structural support of the trunk and upper limbs during difficult positions and static postures ([Fig. 2](#)). With regular exercise of these muscles, ideally three to four times per week for 30 minutes, increased strength and support of the most used muscles can increase resiliency and lead to a decrease in injury.

An ergonomic working environment is equally as important as physical training. A number of adjustments and practical ergonomics tools may be used to reduce chronic strain and injury ([Fig. 3](#)). Another useful tool recently described is the application of kinesiology tape to support postural stability, as described by [Dong et al. \(2021\)](#). Of note, when purchasing office equipment, adjustability is imperative to allow for use by multiple physicians and staff.

With the creation of an ergonomic working environment and the practice of stretching and strengthening exercises, dermatologists may improve odds of avoiding musculoskeletal injury and disability. As in other specialties, such as dentistry, improving ergonomics and reducing the daily physical strain of work can lead to improved quality of life and a sense of reward from work ([Droeze and Jonsson, 2005](#)).



Fig. 1. Stretching exercises. (A) Doorway pectoral stretch to reduce rounding of shoulders. Stretch is accomplished by placing arm as shown in open doorway and gently walking forward into doorway, rotating slightly away from elevated arm to feel stretch along anterior chest wall. (B) Standing latissimus stretch to reducing rounding of shoulders. As you pull bent elbow farther overhead, you will feel stretch along posterior aspect of arm. (C) Kneeling hip flexor stretch to reduce pelvic tilt and strain on lumbar spine. Assume position as shown in picture. Tighten glute muscles and gently slide hips forward. Stretch is felt along anterior portion of the hip. (D) Seated cervical stretch to reduce stress and tension in shoulders and neck. Tilt head toward one shoulder and apply gentle pressure with your arm. Stretch is felt along lateral aspect of neck.

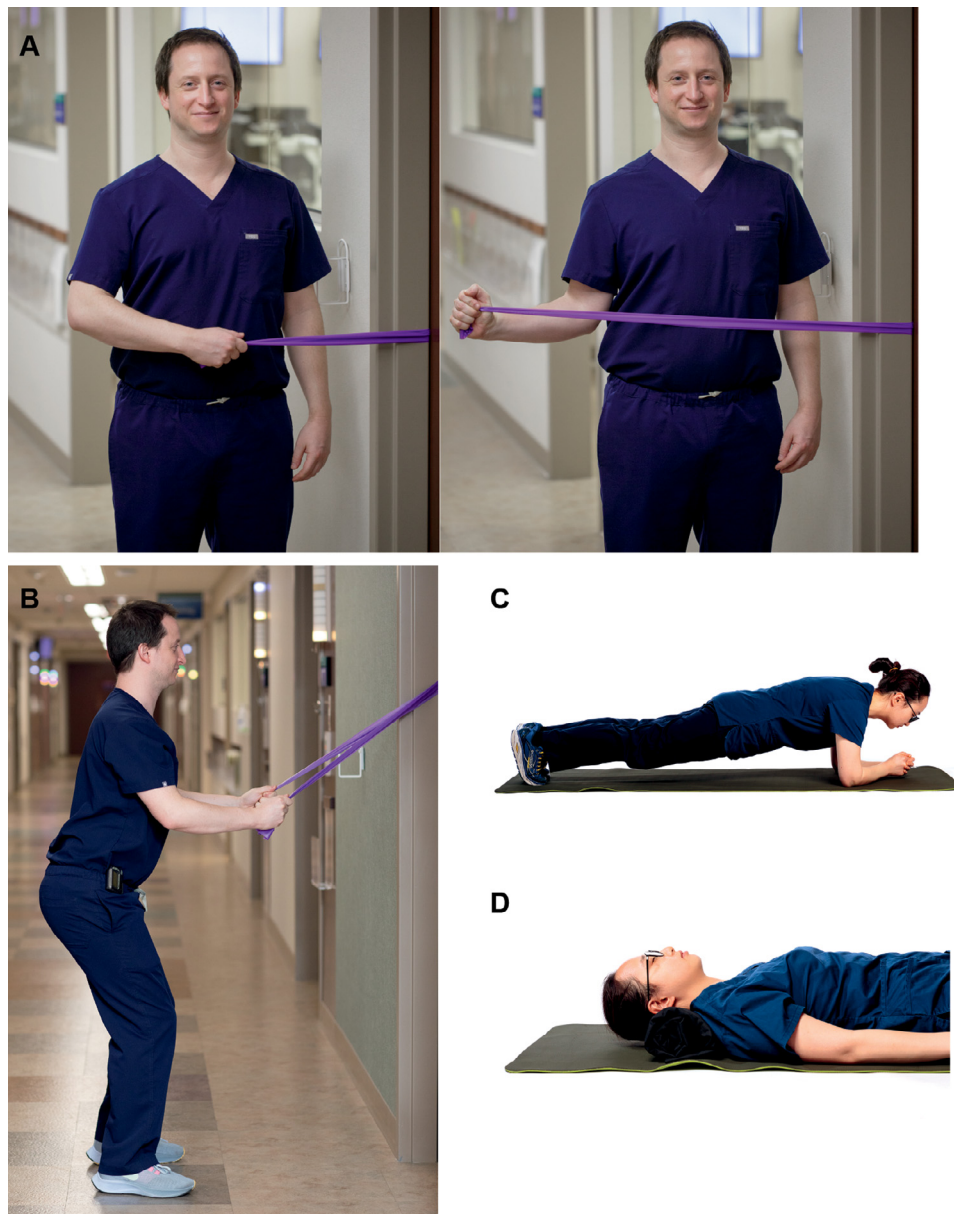


Fig. 2. Strengthening exercises. (A) Starting and ending position for external rotation rotator cuff strengthening with resistance band. Slowly rotate arm out and back, as shown in picture, and repeat to fatigue in shoulder. (B) Starting position for standing scapular retraction. Assume position shown and row arms backward against band resistance while pinching shoulder blades together. (C) Plank exercise for core strengthening while maintaining spinal alignment. Assume position shown while maintaining glute and core contraction for stabilization of the pelvis and lower back. (D) Cervical stabilization strengthening with chin tuck into rolled towel. Assume position shown and perform gentle chin tuck to press down into towel that is rolled under the neck.



Fig. 3. Ergonomic tools. (A) Resting foot stand and chair with brakes for prolonged seated postures, especially at a microscope. The foot stand can provide stability and relieve tension on the hip flexors. Chairs should be close enough to the desk space to allow for lower back support. (B) Surgical loupes allow for visualization of the field while maintaining an upright posture, reducing cervical flexion. (C) Anti-fatigue mats at sites of prolonged standing to relieve pressure on the soles of the feet.

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Study approval

The author(s) confirm that any aspect of the work covered in this manuscript that has involved human patients has been conducted with the ethical approval of all relevant bodies.

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