

Importance of Exercise for Career Longevity: Maintaining Fitness, Strength, and Flexibility as a Plastic Surgeon

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Summary: The benefits of exercise for the general population are well established, although there is limited information focusing on its importance for plastic surgeons. Plastic surgery is arguably one of the most physically taxing fields within medicine due to lengthy operations that often require putting oneself in uncomfortable positions for the majority of the case, all while maintaining mental focus and discipline. It is essential to incorporate regular routines that can optimize a plastic surgeon's mental and physical capacity both short- and long-term. Exercise provides multiple physical benefits and simultaneously contributes to better mental and emotional health. Unfortunately, it is rather uncommon for those within our profession to exercise on a regular basis, with lack of available time being a major contributor. Considering the physical nature of our specialty, plastic surgeons are susceptible to and frequently have debilitating musculoskeletal pain and injuries. In this article, we discuss the benefits of exercise on mental health and physician burnout, its potential for injury prevention, and strategies for implementing physical activity on a regular basis to sustain long and fulfilling careers as plastic surgeons. (*Plast Reconstr Surg Glob Open* 2025; 13:e6439; doi: 10.1097/GOX.00000000000006439; Published online 29 January 2025.)

INTRODUCTION

Plastic and reconstructive surgery is an incredibly rewarding specialty but also places tremendous physical and mental demands on the individual. Meeting these demands is challenging and requires intentionality and resilience to achieve physical and mental well-being. The two go hand-in-hand; physical activity has been shown to have a positive effect on mental wellness. Maintaining endurance across both facets is essential to accomplishing a long and fulfilling career as a plastic surgeon.

The authors of this article feel strongly about the importance of regular exercise. Each has a passion for exercise and fitness and makes an effort to regularly incorporate it into their lives. H.M.R. spent most of his life participating competitively in team sports such as baseball, basketball, and football in addition to his active life on the beach, surfing and playing beach volleyball. Y.M.B. performed on

dance teams, spending evenings practicing choreography, and mornings strength training. C.A.K. played competitive tennis when he was younger, developed a passion for triathlon as an adult, and now incorporates aerobic and resistance training into his routine. Although we encourage our patients to develop healthy lifestyle habits, we do not always follow our own advice. Whether due to the demands of the job, family obligations, or other time constraints, it has become increasingly difficult to participate in our respective athletic activities as our careers progress.

The challenge of maintaining a regular exercise program begins as early as medical school, as classroom and clinical workloads increase. Students, resident physicians, and attending physicians alike can relate to this struggle. Each phase of training provides unique challenges. Medical students are required to spend long hours studying while participating in research and extracurricular activities. Resident physicians are in a similar position but with the added duty of a busy work schedule with clinical responsibilities. For attending physicians, the weight of a full clinical work schedule is compounded by administrative responsibilities. Clearly, the demands of a career in

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medicine, and plastic surgery in particular, make it difficult to engage in the athletic activities that we once participated in. However, regular exercise increases our chances of long-term success as plastic surgeons, and therefore, we must find a way to make this a regular habit in our lives.

LIMITED TIME FOR EXERCISE

Lack of available time is frequently cited as the primary obstacle to exercising on a regular basis. Although physicians experience a glimpse of this struggle in medical school, consistently exercising becomes exponentially more difficult during residency training, especially surgical residency. One article bluntly stated, “Residency is bad for fitness.”¹ This simple statement holds significant truth. Our focus during residency training is to become proficient and gain expertise in our respective specialties while providing care to patients. We have a fixed number of years to gain as much knowledge and clinical skills as we can from our mentors. As a result, we often find ourselves sacrificing aspects of our personal time, including time for exercise, to fulfill our training obligations and become the best surgeons we can be.

One study that evaluated resident physicians in multiple specialties revealed that all specialties noted a significant reduction in both the number of days and hours per day exercising compared with during medical school. Of note, surgical specialties had the largest decline in hours spent exercising per day.² In another study, only a third of general surgery residents believed they exercised enough, with half reporting an undesirable weight gain during residency.³ Resident physicians most commonly report lack of available time as the ultimate barrier to exercising.^{4,5} In fact, Suskin et al⁶ discovered that the aerobic fitness of residents declined as clinical workload increased. Although this fact is not surprising, it should not be overlooked.

This pattern remains true for attending surgeons as well. One study found that 50% of surgeons met the Centers for Disease Control and Prevention guidelines for aerobic exercise with only 33% meeting the requirements for resistance or weight training.^{7,8} Another study revealed that over half of oculoplastic surgeons reported participating in less exercise than what is needed to maintain wellness.⁹ Evidently, finding time to exercise is a difficult task. However, it is very possible to make a workout more time-efficient to accommodate our schedules. We are all given the same amount of time each day, and as one op-ed written by a surgical resident stated, “The key, as always, is good time management.”¹

IMPACT ON MENTAL HEALTH

Allocating time for exercise and physical activity is known to be beneficial for one’s mental health.^{10,11} This theme is echoed in the literature. One article by a general surgery resident describes feelings of reward, and another claims that exercise has the ability to improve mental energy and concentration for physicians.^{12,13} Another article continues this theme, where a surgical resident describes their workout as stress relief that is both physically and mentally rewarding.¹² Multiple studies

Takeaways

Question: Why is exercise essential for the well-being and success of plastic surgeons?

Findings: This review article discusses the importance of exercise for plastic surgeons. Many surgeons report difficulty in finding time for physical activity, which is compounded by the fact that plastic surgery is a demanding specialty. The literature reveals that exercise has benefits for physical and mental well-being as well as the potential to enhance career longevity. Here, we provide strategies to incorporate exercise into the daily lives of plastic surgeons.

Meaning: Plastic surgeons should exercise regularly to optimize physical and mental well-being as well as career longevity.

have demonstrated the positive effect of exercise on mental wellness for medical professionals. Both medical students and attending surgeons report better quality of life scores when adhering to Centers for Disease Control and Prevention recommendations for aerobic exercise or strength training.^{14,15} In addition, resident physicians who exercise on a regular basis are less likely to experience depression and signs of anhedonia.⁴

On the other hand, lack of physical fitness can have significant detrimental effects on a person’s mental well-being.^{10,11} Low physical activity levels among resident physicians are associated with poor mental health and increased rates of depression and anxiety symptoms.^{16,17} Two studies analyzing otolaryngology resident physicians, one of which also included plastic surgery and other surgical subspecialties, determined that less exercise correlated with lower quality of life.^{18,19} The importance of exercise on our mental health is undeniable.

On a related note, it would feel incomplete to discuss the effect of exercise on mental health in medicine without exploring its influence on physician burnout—a syndrome of emotional exhaustion, depersonalization, and decreased sense of personal accomplishment.¹⁹ Given the prevalence of burnout among physicians, numerous studies have examined the relationship between burnout and modifiable risk factors such as exercise. A recent systematic review assessing resident and attending surgeons revealed that physical activity and exercise are associated with less burnout.²⁰ The same trend was noted in a 2021 national survey of medical students.²¹ In addition to engaging in aerobic exercise and strength training, prior participation in team sports has been shown to decrease burnout in neurosurgery residents.²² This demonstrates that the lessons in collaboration and resilience that team sports teach, and the social connections they foster, may be important for preventing burnout in longer surgical residencies, such as plastic surgery. In a literature review that analyzed factors influencing burnout in surgical subspecialties including plastic surgery, greater burnout correlated with insufficient time for exercise.¹⁹ Furthermore, numerous surgical subspecialties—plastic surgery, otolaryngology, orthopedics, neurosurgery, urology—showed exercise to

be protective against burnout. Overall, although exercising is essential for several reasons, its importance in preventing burnout is paramount for plastic surgeons whose goal is to sustain a long and fulfilling career.

PLASTIC SURGERY IS PHYSICALLY DEMANDING

In addition to the challenge of finding time to exercise alongside a career in plastic surgery, the act of performing surgery itself places physical demands on the body. In the operating room, surgeons are required to maintain static postures for long periods of time, which contributes to the development of musculoskeletal disorders, especially back pain, through increases in inflammatory cytokines.²³ Plastic surgeons may be at even higher risk of incurring damage caused by these static postures, due to both the delicate nature of our procedures and the practice of plastic surgery subfields such as microsurgery, which require longer periods of static posture along with ultrafine movements.²⁴

Surgeons often adopt awkward positions while operating, such as head forward with flexed neck, shoulder abduction with arm internal rotation, thoracic spine kyphosis, and asymmetric positioning of the shoulders and pelvis.²⁵ Due to the nature of our specialty, plastic surgeons may be more susceptible to these uncomfortable positions, especially when using loupes and headlights. In one study that surveyed 77 surgical specialists, plastic surgeons had the highest rate of pain while operating, at 94%.²⁶ This is not a surprising finding, as the majority of plastic surgery operations are open procedures that require substantial physical effort. Overall, rates of musculoskeletal pain among surgeons are much higher than previously believed, leading to the problem being coined “an impending epidemic.”²⁷

For plastic surgery specifically, musculoskeletal pain while operating has been shown to affect between 78% and 94% of attending surgeons, depending on the study, and most commonly affects the neck, shoulders, and lower back.^{25,28,29} Contrary to what one might assume, these problems often begin very early in plastic surgeons' careers. A national survey of plastic surgery residents found that 94% had experienced musculoskeletal pain in the operating room, and 42% experienced it “often.”³⁰ There was no correlation to postgraduate year level, suggesting that these problems begin almost immediately in surgical training.

Unfortunately, some of these musculoskeletal problems can go on to impact plastic surgeons' quality of life, productivity, and career longevity. Work-related musculoskeletal injuries can lead to missed workdays and fewer operations being performed while recovering from injury.³¹ Among surgeons and medical interventionalists with work-related musculoskeletal disorders, as many as 12% require a leave of absence, activity restriction or modification, or early retirement.³² In a study of plastic surgeons, 6.7% of affected respondents required surgery for their musculoskeletal injury.²⁹

Even if musculoskeletal pain is not severe enough to mandate time off work, surgical treatment, or early

retirement, it can affect our ability to operate at maximum potential. In a survey study, musculoskeletal pain at more than 1 anatomical site was reported by 77% of respondents and was significantly associated with decreased self-reported work ability.³³ There is also evidence that people with musculoskeletal pain of the neck and upper extremity are more likely to have impaired position sense acuity and tracking ability when performing tasks with the upper extremities.³⁴

Despite this information, surgeons do not always address injuries head-on. Less than one-third of surgeons who have musculoskeletal pain exacerbated by operating seek treatment for their symptoms,³⁵ and these injuries are also underreported by surgeons to their institutions.³¹ The reason for this may lie in the perception that the operating room environment cannot be changed, a certain amount of musculoskeletal strain is unavoidable in our profession, and that protecting ourselves will come at the cost of letting down our patients or colleagues.^{25,36} Some of this may be true, and the operating room environment does present unique challenges in combating musculoskeletal strain.³⁷ For example, our surroundings are less adaptable because human anatomy is not changeable for our comfort. Surgery is also time-sensitive, demanding, intense work during which taking breaks is not always best for the patient or even possible. Despite these obstacles, we must challenge ourselves to find solutions to keep our bodies healthy and functioning at peak performance.

HOW CAN PLASTIC SURGEONS OPTIMIZE PHYSICAL FITNESS?

Counteracting the physical demands of a life as a plastic surgeon can seem daunting, but there are solutions, both at the institutional and individual levels. On a larger scale, though beyond the scope of this article, we can increase ergonomics awareness and prevalence of education programs among our residency programs and clinical practice groups.²⁵ On a personal level, powerful changes occur with intentionality in our daily habits and prioritizing fitness practices both at and outside of work.

Strategies at Work

Simply increasing our awareness of poor postural habits in the operating room and creating a culture where we correct each other is the first step. In a 2020 collaborative study involving physical therapists and plastic surgeons, Winters et al²⁵ created an excellent repository of videos and diagrams that illustrate the biomechanics of healthy postures, detail muscle groups at risk, and propose targeted exercises. The more we learn about this topic, the more we notice the maladaptive habits we exhibit, and our ability to correct these habits begins.

Microbreaks have also been proposed as a method of reducing musculoskeletal pain in the operating room. This consists of a minute or two of stepping away from the operating table to stretch or adjust posture while maintaining sterility. Across several studies, implementing microbreaks for surgeons and operating room staff at 20- to 40-minute “medically convenient” intervals during

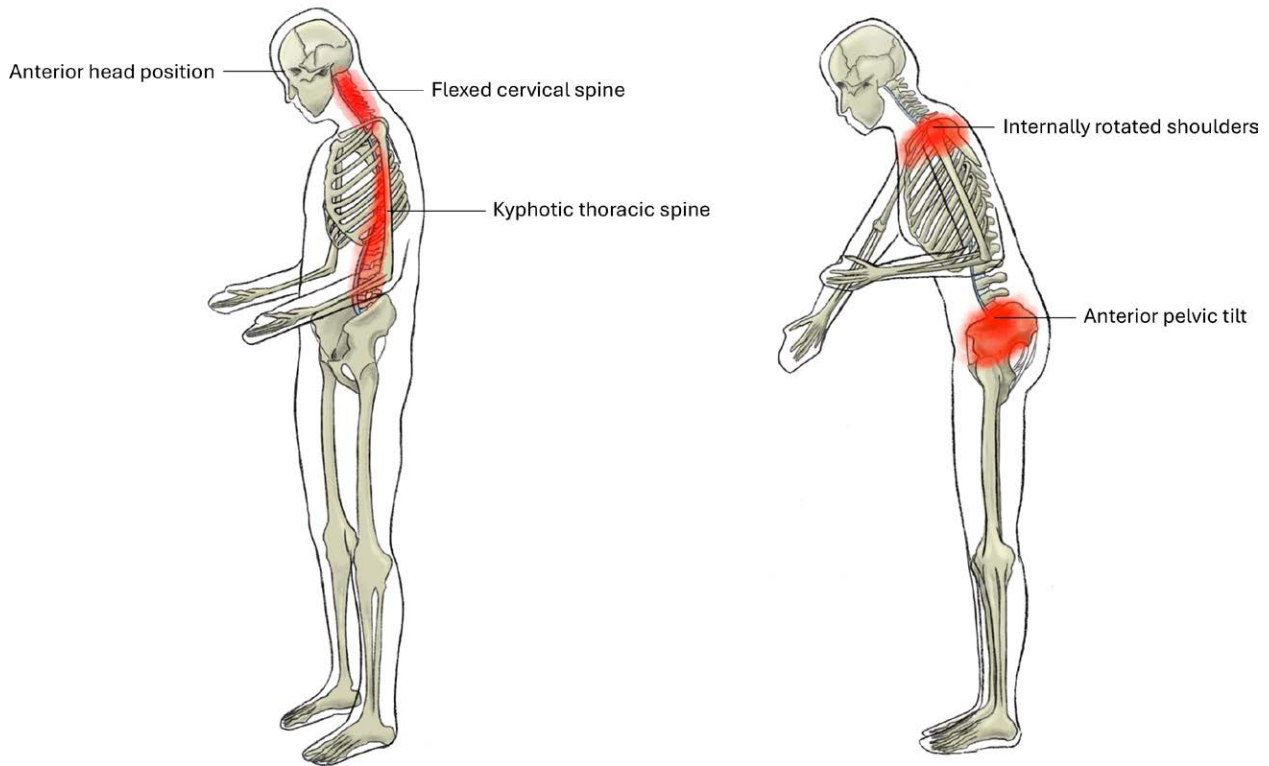


Fig. 1. Anatomic regions of the human body that are at highest risk for injury in surgeons.

cases results in a significant decrease in participants' neck, shoulder, hand, and lower back pain.³⁸⁻⁴⁰

One concern with the microbreaks strategy is the possible interruption of the surgeon's workflow.^{38,41} However, prior studies have not found any significant difference in operative time when microbreaks are implemented, and most surgeons felt subjectively that their mental performance was unchanged and their physical performance improved.^{38,40,42} Microbreaks may also mitigate muscle fatiguability.⁴³

Even if we are skeptical about implementing scheduled pauses during surgery, an awareness of the benefits of microbreaks on physical health and performance could allow us to work them into the inevitable microdelays that already occur while operating. Do you need an instrument that you do not have in the room? Perform an exercise while staff obtains it. Watching another team member operate? Keep your eyes on them but stretch your shoulders for a few seconds. Flexing the bed for an abdominoplasty? Adjust your posture while the anesthesia team moves the bed into position. There are many natural opportunities for implementing these microbreaks.

Strategies Outside of Work

The benefits of regular exercise in the general population are well known,⁴⁴ but for plastic surgeons, strength training is especially important. There are 2 general categories of strength training exercises: compound and isolation. Compound exercises utilize multiple muscle groups and result in the ability to move heavier weight; examples include squats, deadlifts, bench press, and overhead press.

Isolation exercises focus on training 1 target muscle group; examples include biceps curls, leg extensions, calf raises, and triceps extensions. Both exercise types are similarly effective in improving strength.⁴⁵ Interestingly, one study discovered that the order in which you perform exercises within a training session has a greater effect on strength gains than the type of exercise itself, with increased effectiveness when performed at the beginning of the training session.⁴⁶ Therefore, although we would not necessarily recommend 1 type of exercise over another, it would be advantageous for surgeons to incorporate targeted variation and specificity within their exercise programs to maximize the benefits of strength training.⁴⁷

Strength training has been shown to be more beneficial than other exercise modalities, such as aerobic exercise and endurance training, in reducing multiple types of chronic musculoskeletal pain including the neck and low back.^{48,49} By offering a protective role against cervical and lumbar spine pain, strength training and stretching may represent critical pillars for career longevity and improved surgical performance.⁵⁰ Rohrich et al⁵¹ phrased it well in their recent article: "The correlation between athletic training and the longevity of a surgeon's career cannot be overemphasized, just as any successful athlete recognizes that there is no substitute for proper physical training to maintain endurance and prevent injury."

Fortunately, the body parts most at risk for injury in surgeons are well described and therefore can be targeted when designing an exercise regimen (Fig. 1). Strength and flexibility exercises designed to counteract the damaging effects of operating have been proposed in the

literature and are summarized in Supplemental Digital Content 1. (See figure, Supplemental Digital Content 1, which displays the summary of muscle groups at risk and suggested exercises, <http://links.lww.com/PRSGO/D781>.) The two go hand-in-hand, as strength training may contribute to the development and maintenance of flexibility.⁵² Importantly, flexibility exercises provide benefits such as increased range of motion, improved posture, and injury prevention. There are 2 main stretching categories for enhancing flexibility: static and dynamic. Static exercises involve holding a stretch in a single position for a period of time; examples include forward fold, chest opener, and child's pose. On the other hand, dynamic exercises involve stretching muscles throughout a controlled movement; examples include lunges, high knees, leg swings, and jumping jacks. Implementing these exercises as warm-up or cool-down at the gym or for an athletic event would be beneficial. Interestingly, warm-up exercises before operating have been shown to improve surgical performance during laparoscopic cases.^{53–55} It would be reasonable to believe that the same effect would be seen for open cases as well, although this has not yet been analyzed in the literature. For those of us with the means to afford it, it may help to work with a personal trainer (or if dealing with active injury, a physical therapist) who can target specific goals.²⁵

Armed with this information, an ideal exercise regimen for a plastic surgeon would build flexibility, strength, and endurance and would involve additional focus on muscle groups at high risk for strain. Though this information is helpful, it does not solve the problem of when or how to implement exercise into our lives. Finding time for structured exercise while juggling a career in plastic surgery, not to mention life and family, is extremely challenging. By its very nature, the solution must be individualized. Well-researched habit building strategies such as starting small, repeating the new action in the same context every time (and its related concept of “habit stacking”), and simple persistence may help get us started to find a unique strategy that works for each of us.^{56–58}

CONCLUSIONS

As with most problems in plastic surgery, there is no one perfect solution to maintaining physical strength and fitness as a plastic surgeon. The authors have found that in our own lives, the answer varies highly among us. For H.M.R., being a multiseason athlete has turned into intramural football and softball on the weekends and prioritizing strength training at the gym whenever his schedule allows. For Y.M.B., daily hour-long dance rehearsals may be a thing of the past, but she heads to the gym whenever possible, and stretches every day between cases to maintain flexibility and resistance to injury. For C.A.K., weight training, long runs, and early morning ice plunges help him maintain physical endurance and come to work energized. Keys to succeeding in this effort include motivation, discipline, and thoughtful time management. Not every day is a win but in the long run, consistently prioritizing our bodies' health will give us the best chance at a long and healthy life and career as plastic surgeons.

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DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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