



# Forestalling Anti-Ergonomics in Plastic Surgery: Challenging the Modus Operandi?

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Despite formidable advances throughout surgical disciplines spanning decades, plastic surgeons, especially microsurgeons, have most certainly ignored the memo to sufficiently recognize the alarming prevalence of musculoskeletal disorders (MSDs), a consequence of anti-ergonomic postures assumed during intricate procedures (eg. microsurgery), capable of physical limitations which can lead to early retirement [1]. Collective ignorance of the aforementioned predicament is reflected in the plastic surgery literature wherein epidemiologically rigorous studies remain non-existent. Anecdotal reports evidencing the crippling effect of anti-ergonomic postures along with rigorous operative practices in plastic surgery procedures that have exaggerated operative durations suggest increased predisposition to occupational disorders like cervical disk disease, distal interphalangeal arthrosis, ligamentous injury, pulmonary embolism secondary to deep vein thrombosis and tendinitis [1]. Remarkably, evidence in the literature highlights the commencement of musculoskeletal discomfort as early as in residency, [2] even though previous studies have documented 35.4 years as the initiation point of musculoskeletal symptoms [1]. Furthermore, according to Kokosis and colleagues' survey, fifty-two percent of plastic surgery resident respondents noticed musculoskeletal symptoms in the first two years of residency [2]. Interestingly, although eighty-nine percent of respondents were aware of their compromising surgical posture, only twenty-two percent reported receiving ergonomics training in their institution [2]. Additionally, sixty-four percent of respondents of the aforementioned survey mentioned the absence of operating room culture that promotes reporting musculoskeletal discomfort symptoms [2]. Although compromising posture during surgery remains largely unavoidable, workplace MSDs can still be minimized if not entirely prevented [1,3].

Winters and colleagues present a collection of ergonomics educational content demonstrating a posture assessment tool that comprises of ideal postural recommendations to be followed during surgery accompanied by video demonstrations and instructions on baseline strength and stretching exercises [3]. A prophylactic implementation of the aforementioned tool by residency programs can alleviate musculoskeletal discomfort early on ensuring a positive reduction in the incidence of MSDs therefore automatically increasing operative productivity and longevity in years to follow.

Additionally, to augment this practice and ensure maintenance of near-to-ideal posture in the operative room, a wearable posture correcting device can be used [4]. This cost-effective device (~80 United States Dollars (USD)) which can be fitted to the back of surgical caps, monitors postural changes and after neutral calibration, it detects postural changes and emits vibrations alerting the individual to revert to a more ideal posture [4]. Remarkably, three residents (accounting for 60% of the total study sample size) who participated in the preliminary investigation reported that their pre-test musculoskeletal discomfort was alleviated on using this device, demonstrating the promising potential of the same [4]. Evidence also suggests improvement in surgical ergonomics with the implementation of video display visualization methods and augmented reality glasses when compared with a conventional microscope [1].

Even though ergonomics improvement and its positive impact on user stamina are documented, the use of three dimensional (3D) visual display has been argued to be deterred by the longer operative time associated with it which can be attributed to the initial acclimatization of the surgical team to this technology [1,5]. Will et al document a reduction in operative duration upon subsequent employment of this technology, thereby suggesting that longer operative duration is a temporary issue that can be

addressed adequately over time [5].

Therefore, even though studies with a higher level of evidence are required to externally validate the employment of this technology, the prelim results in the literature highlight its potential to be an effective tool that can further minimize the rate of MSDs when accepted in clinical practice in the near future.

Reinforcement of the well-being program with a physical well-being wing that provides trainees and consultants the provision to report musculoskeletal discomforts and seek appropriate health professionals' support is of the utmost importance. It is imperative to address this impending issue to improve the longevity and efficiency of future caretakers of plastic surgery.

Large multicenter longitudinal studies and intervention-specific validation studies of high evidence cadre are anticipated to understand the true burden of MSDs in plastic surgery and address the predicament effectively thereby ensuring optimal surgeon productivity and maximizing outcome superiority and patient safety. A portion of the quote by Brian Krans - "Don't just exist. live." can be extrapolated for the existing ergonomics conundrum faced by plastic surgery residents and practicing surgeons - "Don't just exist in pain. Live and learn in tranquility. More importantly, thrive."

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