

Fig. 2. The trend of the top 10 words seen in abstracts from 2014 to 2018 in the *Journal of Reconstructive Microsurgery*.

equivalent flap outcomes and decrease operative time. Dextran has no effect on flap survival, but increases systemic complication by 2.9- to 7.2-fold.

In an era where composite tissue allotransplantation and microsurgical innovations for lymphedema are becoming the norm, we must continue to challenge our way of thinking. We must continue to verify what we see in clinical practice with sound studies and data points to confirm that we are in fact achieving the best possible outcomes for our patients. Dr. Swanson had put it best, “Many plastic surgeons believe that the way forward is through creativity—listening to our inner Michelangelo. A superior role model is Galileo, who had the intellectual courage to challenge the conventional wisdom.”⁵ Plastic surgeons’ evidence supports, rather than challenges, our innovative techniques. Regardless of personal views, there is evidence that a focus on outcomes in microsurgical practice is already occurring!

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Kenneth L. Fan, M.D.

Jessica Figueroa

Karen K. Evans, M.D.

Georgetown University Hospital
Washington, D.C.

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Correspondence to Dr. Fan
3800 Reservoir Road NW
PHC Plastic Surgery, First Floor
Washington, D.C. 20007

DISCLOSURE

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Yoga Breathing Exercises (Pranayama) Decrease Hand Microtremor in Young Microsurgeons: Toward a New Paradigm in Surgery

Microsurgery is a modern surgical technique that allows surgeons to operate on tiny blood vessels and nerves, using microscopes and highly precise instruments.¹ Physiologic hand tremor occurs naturally, because of oscillations of the upper extremities. Tremor can be exacerbated by stress and anxiety, interfering with fine motor tasks and potentially impacting surgical performance.² Learning to relax is paramount to reduce the influence of these factors. Yoga practice consists of eight steps, one of which, the pranayama, deals specifically with control of breathing. Pranayama has four objectives: a stepwise reduction in breathing

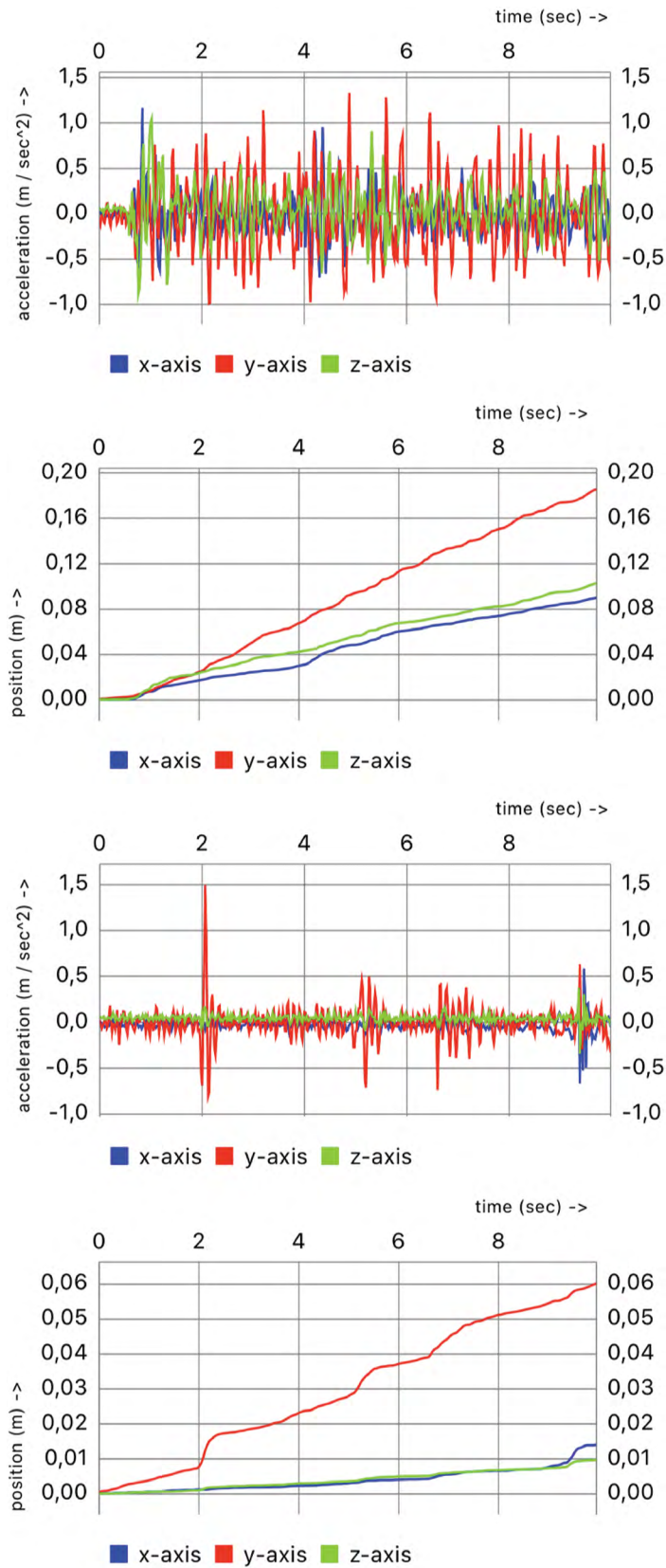


Fig. 1. Wearable Movement Disorder Quantifier graphics show hand movements before pranayama breathing (*above and second row*) and after 2 minutes of pranayama (*third row and below*).

frequency, attainment of a 1:2 ratio for duration of inspiration and expiration, a breath-holding period at the end of inspiration that lasts twice the length of expiration, and mental concentration on the noise of the air through the glottis produced during breathing.³

During the practice of pranayama, it is advisable to keep the spine erect and to activate the control of the abdominal wall to produce a predominantly thoracic inspiration and expiration. At the end of the expiration, the breath is suspended for 2 seconds. No studies in the current literature have objectively investigated the benefits of pranayama on the practice of microsurgery.

We conducted a prospective study on 50 surgery residents aged 24 to 33 years (mean, 27.5 years). Participants hand tremor was recorded before and 2 minutes after the pranayama.

To record hand microtremor, the Wearable Movement Disorder Quantifier application was used. The Wearable Movement Disorder Quantifier measured wrist and hand movement over a period of 1 minute before and after pranayama. Using the sensors in the Apple Watch, an estimation of traveled distance in centimeters was calculated. This distance, shown as the score, was used to objectively measure the severity of (involuntary) movements. The *t* test was used to compare scores before and after the pranayama breathing. Results (Fig. 1) showed a significant reduction of hand tremor ($p = 0.006598$).

Yoga has been suggested as a treatment for disorders ranging from anxiety to multiple sclerosis and asthma. It can also improve the quality of life of health workers.³⁻⁵ The scientific evidence regarding its benefits, however, is weak. Our study is the first to demonstrate an objective hand tremor reduction following pranayama yoga breathing. This is a simple technique that can be learned by anyone, with a small learning curve. The resulting reduction of the hand microtremor makes the practice of microsurgery more enjoyable.

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Simone La Padula, M.D.

Barbara Hersant, M.D., Ph.D.

Giovanni Roccaro, M.D.

Department of Plastic, Reconstructive, and Maxillofacial Surgery
Henri Mondor Hospital
University Paris XII
Créteil, France

Francesco D'Andrea, M.D.

Department of Plastic and Reconstructive Surgery
Azienda Ospedaliera Universitaria Federico II
Naples, Italy

Elisa Grella, M.D.

Department of Plastic and Reconstructive Surgery
Azienda Ospedaliera Universitaria Università degli studi della Campania Luigi Vanvitelli
Naples, Italy

Jean Paul Meningaud, M.D., Ph.D.

Department of Plastic, Reconstructive and

Maxillofacial Surgery
Henri Mondor Hospital
University Paris XII
Créteil, France

Correspondence to Dr. La Padula
50 Rue Saint Sébastien
75011 Paris, France
drsimonelpadula@gmail.com
Instagram: [dr_simone_la_padula](https://www.instagram.com/dr_simone_la_padula)

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Pharmacoplastic Surgery: Emerging Concepts

“Pharmacoplastic surgery” is the concept of using a device with pharmacologic components to augment the safety and/or efficacy of the device in the field of plastic surgery. With the emergence of these combination products, the U.S. Food and Drug Administration established the intercenter agreement between the Center for Drug Evaluation and Research and the Center for Devices and Radiological Health, to classify skin closures or bandages with pharmaceutical agents, and tissue grafts with pharmaceutical agents as devices with drug components. Fortunately, combinations of the U.S. Food and Drug Administration–approved devices and drugs fall under investigational device exemption, thereby facilitating the off-label use of these devices in clinical studies to collect safety and effectiveness data, before premarket approval by the Center for Devices and Radiological Health.¹

Suture materials, staples, adhesives, cements, glues, conduits, scaffolds, grafts, couplers, clips, implants, prostheses, plates, meshes, tubes, nails, wires, and screws have the potential to be augmented with bioengineered pharmacologic components. Using surgical devices as vehicles to locally administer antimicrobials, antiinflammatories, antineoplastics, vitamins, growth factors, silver, DNA, antibodies, proteins, anesthetics, and analgesics can improve postoperative complications, immune responses, and tissue healing. Drug delivery to