EDUCATION IN LIFESTYLE MEDICINE

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Mindfulness in Surgery

Abstract: *In the past 20 years, interest in mindfulness and its cultivation through various meditative practices has increased astronomically. This is reflected in the popularity of mindfulness training programs, its ever-widening exposure in popular culture, and in the number of scientific articles published on the topic. With the recent focus on burnout in the medical profession and reports of high levels of anxiety and depression among residents and staff physicians, the potential applications of mindfulness are becoming increasingly apparent in the hospital setting. Mindfulness meditation may be particularly useful for surgeons because they are required to maintain their presence of mind and mental focus in the setting of challenging physical and mental tasks. Furthermore, personality traits such as perfectionism and intensity, which may have facilitated success in the competitive environment of medical school and residency training, may later manifest as intolerance and impatience, contributing to frustration and anger. A mindfulness meditation practice may help reduce the tendency to react to these emotions, yet still allow surgeons to remain motivated to excel. This article provides a definition of mindfulness and describes its introduction to Western culture. The connection of a regular meditation practice to improvements in focus and performance are reviewed. The potential benefits of mindfulness training to a surgical career are discussed, and an approach to introducing mindfulness and meditation to individual surgeons and surgical departments is outlined. We hypothesize that the introduction of department-wide training programs in mindfulness and meditation could benefit surgeons with regard to technical performance, empathy toward patients, academic productivity, and general life and career satisfaction.*

Keywords: mindfulness; meditation; surgery

Definition of Mindfulness

Mindfulness is often defined as the state of bringing one's attention to the present moment. It can be developed through the practice of meditation and through other training. To provide a simpler definition, mindfulness is a way of training the mind to sustain its focus. When defined in these terms, there is concrete application of mindfulness to the practice of surgery.

Cultivating mindfulness creates the ability to find the space between external stimuli that result in a wide range of emotions and the response to those external stimuli. This allows an individual to become less reactive and more thoughtfully responsive. Common misconceptions about mindfulness include that it is about being relaxed or "Zen" and not becoming angry, frustrated, or emotional; however, it is less about not having these emotions and more about recognizing how we are in relationship to them and how it is possible in the moment to respond to them mindfully rather than react to them mindlessly.[1] Mindfulness is also not about lacking goals or ambition; rather, becoming more mindful can reduce distractions and allow us to work more effectively toward our goals, in our career and in our lives.

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Mindfulness is inherently about making a conscious choice about how to respond to that which is taking place around us, even when it is beyond our control. When considering the daily life of a surgeon and all that takes place during a routine work day, the ability to disengage from constant stimuli and maintain a sense of emotional balance is quite important.

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History of Mindfulness

Although present in many of the world's traditions, mindfulness has its roots in Eastern religion, with Buddhist monks using mediation practices to understand consciousness, cultivate compassion, and relieve suffering. For many centuries, the active practice of mindfulness was largely confined to monasteries, with meditation maintaining a strong connection to the Buddhist religion. This underwent a major shift in the 1970s, when meditation practices became more popular in the United States. It was initially proposed that such practices could be applied to medical patients with chronic illness, pain, disability, and psychological disorders such as anxiety and depression. In 1979, Dr Jon Kabat-Zinn founded the mindfulness-based stress reduction (MBSR) clinic in the Department of Medicine at the University of Massachusetts Medical Center and offered an 8-week intervention in the form of a course for outpatients by physician referral. A few years earlier, Dr Herbert Benson, a professor at Harvard Medical School, had described another approach, which he termed *the relaxation response* for patients with hypertension. Both luminaries took key steps in demonstrating clinical benefits through published scientific studies and catapulted these historic practices into modern contexts.

Introduction to Mainstream Society

It was not long after the introduction of meditation practices to medical patients that the lay public caught on to its potential benefits. Regular meditators report reduced stress levels and an improved sense of well-being, and research studies have found that mindfulness meditation can alter brain structure (gray matter density) in numerous regions in the brain. In the case of the amygdala, the "fight or flight" center of the brain, there is evidence that it reduces both its size and activity. Activation of the amygdala can be quite useful when fleeing from an attack or a predator, but perhaps less useful, and in fact dysfunctional, when activated in the setting of a frustrating interaction with a colleague, when responding to a confrontational email, or perhaps most importantly, when faced with a difficult patient or technically challenging situation in the operating room. Put quite simply, reducing amygdala activation with mindfulness meditation may increase our ability to "keep our cool" in stressful situations.

Dr Sara Lazar, a neuroscientist at the Massachusetts General Hospital and Harvard Medical School, studied the effect of meditation on brain structure. One study compared the brain scans of long-term meditators with a control group and noted an increased amount of gray matter in the auditory and sensory cortex of the long-term meditators.[2] A follow-up study compared 2 groups of nonmeditators, one of which enrolled in an 8-week MBSR program. The group enrolled in the course were noted to have differences in regions of the brain related to learning, cognition, memory, and emotional regulation, with a reduction in amygdala-related activity.[3] These changes in brain structure in the group enrolled in the course were noted after just 8 weeks of meditation training.[4]

Mindfulness in the Business World and Among Professional Athletes

The benefits of mindfulness and meditation have been recognized and widely adopted by high achieving individuals throughout Western society. Numerous articles in the lay press have described the effect of mediation on focus, stamina, and productivity among those pursuing excellence in their careers, most notably, investment bankers and high-level athletic competitors. Many well-known financial institutions and professional sports teams offer training programs in meditation, and several successful and highly visible business leaders and professional athletes have attested to the benefits of a mindful meditation practice. One key aspect of this publicity has been the connection of mindful meditation to improvements in focus and performance. To quote a New Yorker article on mindfulness and the financial industry, one hedge fund manager reports that his entire staff meditates, increasing focus and productivity by reducing distractions.[5] Many businesses offer employees free meditation training, and the Harvard Business Review recently reported that mindfulness is close to taking on "cult status" in the investment world. Professional athletes have attested to meditation boosting their performance and giving them "an edge,"[6] and mindfulness training has become routine for many professional and college athletes and teams. The Nike training center in Portland, Oregon, uses regular meditation training for their athletes. They describe their theory that an athlete's success is largely based on their mindset and mental strength, more so than their actual physical ability. The calm and clarity that comes with a regular meditation practice can allow one to perform to their maximum potential.

Mindfulness Meditation and Surgeons

Physicians have recently begun to adopt these practices in their own lives. Hospitals, private practices, and medical groups are beginning to offer formal meditation training and regular meditation sessions. Mindfulness has been shown to reduce and protect against burnout by physicians at the Rochester Medical Center,[7] reduce medical errors,[8] and increase professionalism.[9] A recent pilot study randomized first-year surgical residents at University of California, San Francisco, to an 8-week MBSR course; they were then compared with a control group. The residents who completed the course were noted to have lower levels of stress and depressive symptoms and, furthermore, had improvements in motor performance and executive function.[10] Indeed, mindfulness has unique

applicability to the practice of medicine and, in particular, to surgery. On a daily basis, academic surgeons are expected to perform challenging technical tasks, make life or death decisions, interact appropriately with colleagues and support staff, participate in teaching medical students and residents, and maintain a sense of empathy toward patients and their families. With these requirements in mind, and with the knowledge that a regular meditation practice improves the capacity for focused attention, assists in emotional regulation, and facilitates impulse control and executive functioning, it would be difficult to imagine that meditation would not be of benefit to surgeons. Meditation practice can also turn the mind's focus away from an overpreoccupation with the eventual outcome and toward the effort of the moment, providing a modicum of nonattachment, which in many ways, somewhat paradoxically, can reduce anxiety and thus improve performance and outcomes.

How to Start: 4 Core Skills of Mindfulness

Developing and sustaining a meditation practice is simple, but not easy. Although it requires very little time, it does require attention and commitment. If these practices are worth pursuing, the key question then becomes how to initiate and sustain such a practice. In the busy life of an academic surgeon, devoting even a few minutes each day to a meditation practice will succeed only if there is a strong conviction on the part of the individual that this will make a positive difference. Fortunately, one of the advantages of starting a mindfulness practice is that relatively short time investments can result in significant differences in our mindset. There are several ways to start a meditation practice, and what might work best for one individual may be very different for another. Furthermore, remaining flexible in our practice and being willing to experiment and try new methods and ways of learning and adapting is key.

A mindfulness meditation practice can include these 4 key components:

1. Regular meditation practice
2. Appreciations/gratefulness
3. Minimeditations throughout the day
4. Managing thought distortions/ reframing negative thoughts

The most important component of a meditation practice is taking a short amount of time each day, in a quiet and uninterrupted setting, to sit still and focus on breathing. Although this can take place at any time during the day, it often works best to do this at the same time first thing in the morning, when there are fewer distractions and less chance of it being forgotten or reprioritized as the day progresses. It often helps to start with a short amount of time, even just 3 to 5 minutes. Many meditators, both those starting out and those with experience, find it useful to utilize a guided audio meditation to assist them. A second component of mindfulness is the regular expression of gratitude, or appreciations. In the work setting, this can be done in your office, clinic, or operating room and entails expressing gratitude for what might seem to be a relatively small or insignificant effort or event but one that made a difference to you or to the team. Using the operating room as an example, this could be a comment on the quick operating room turnover or noticing the care with which the nurse or scrub technician arranged your instruments, or that the administrator at the operating room desk took the time to make sure your next patient was ready for surgery on time. A guideline for meaningful appreciations is to focus on effort, not talent, and to explain why the effort made a difference. When paying attention, events to appreciate are numerous, and taking just a few seconds to acknowledge them can have a significant impact on the entire mood of the operating room. A recent National public radio (NPR) report noted that when a verbal appreciation is made toward one member of a team, it makes the entire team work harder. A third component to mindfulness is incorporating regular reminders throughout the day to refocus on the present, also known as minimeditations. It can be helpful to use a recurring event as a reminder; in the hospital setting, this could be taking a moment to refocus at the scrub sink before each case or a brief reminder to slow down when reaching for the doorknob to enter a patient's room in clinic. Finally, a fourth component of mindfulness is the ability to manage and redirect one's own thought distortions or misconceptions. When juggling the many demands of a daily surgical practice, it can be easy to slip into a pessimistic view of the day's events. The ability to reframe these negative assumptions can have a significant impact on the quality of our day.

To incorporate these components into the daily life of a surgeon, as an individual or in a department, a comprehensive plan needs to be in place. This could include offering surgeons accessible and convenient training courses in meditation, inviting speakers to discuss the benefits of mindfulness, introducing mindfulness exercises at division or departmental meetings, or providing phone apps and reading materials about mindfulness.

Educating surgeons about mindfulness and meditation through formal programs would likely be of tremendous benefit to individual physicians and to whole divisions and departments in academic surgery. One could also hypothesize that it could have an impact on academic productivity and performance in the operating room. This benefit could also have a positive impact on interactions with colleagues and support staff and communication with patients and families, potentially leading to improved patient outcomes and reduced liability issues.[11]

But with all this talk of performance and productivity, there is an equally important reason, as an academic surgeon, to consider learning about mindfulness and adopting it, in whatever way might work individually or for a department or group. The career of a surgeon is a journey, often a profoundly difficult one, and how we approach the challenges of each day influences our experience. To fully appreciate the gift

and privilege of being a surgeon and to care for patients, colleagues, students, support staff, and ourselves, we need to be continuously and consciously aware of all that is taking place around us.

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References

1. Paulson S, Davidson R, Jha A, Kabat-Zinn J. Becoming conscious: the science of mindfulness. *Ann N Y Acad Sci*. 2013;1303:87-104.
2. Lazar SW, Kerr CE, Wasserman RH, et al. Meditation experience is associated with increased cortical thickness. *Neuroreport*. 2005;16:1893-1897.
3. Holzel BK, Carmody J, Vangel M, et al. Mindfulness practice leads to increases in regional brain gray matter density. *Psychiatry Res*. 2011;191:36-43.
4. Holzel BK, Carmody J, Evans KC, et al. Stress reduction correlates with structural changes in the amygdala. *Soc Cogn Affect Neurosci*. 2010;5:11-17.
5. Goldberg M. The long marriage of mindfulness and money. *The New Yorker*. https://www.newyorker.com/business/currency/the-long-marriage-of-mindfulness-and-money. Published April 18, 2015. Accessed August 2, 2019.
6. Mumford G. *The Mindful Athlete: Secrets to Pure Performance*. Berkeley, CA: Parallax Press; 2015.
7. Krasner MS, Epstein RM, Beckman H, et al. Association of an educational program in mindful communication with burnout, empathy, and attitudes among primary care physicians. *JAMA*. 2009;302:1284-1293.
8. Sibinga AM, Wu AW. Clinician mindfulness and patient safety. *JAMA*. 2010;304:2532-2533.
9. Epstein RM. Mindful practice. *JAMA*. 1999;282:833-839.
10. Sancar F. A cultural sea change: mindfulness for surgical residents [published online July 17, 2019]. *JAMA*. doi:10.1001/jama.2019.9999
11. Cooper WO, Spain DA, Guillamondegui O, et al. Association of coworker reports about unprofessional behavior by surgeons with surgical complications in their patients [published online June 19, 2019]. *JAMA Surg*. doi:10.1001/jamasurg.2019.1738