# SOS = Save our surgeons (from succumbing to stress)!

*"It is not stress that kills us, it is our reaction to it."* – Hans Selye

Approximately 90 years ago, János Hugo Bruno "Hans" Selye introduced the concept of stress in modern medicine and simplistically defined it as a "nonspecific response of the body to any demand for change."[1] Factors that induce stress (stressors) could be physical or psychological.[2] The body's response to stress could be physiological (cortisol secretion by the hypothalamus-pituitary-adrenocortical axis and catecholamine secretion by the sympathetic adrenomedullary system) or behavioral.[2] The overall immediate and long-term effects of stress on human health and well-being can be profound and can adversely impact efficiency, performance, quality of life, and longevity.[2]

## Surgeon, Stressors, and Stress

Stress is an inherent part of high-reliability and safety-critical professions. Operation theater, with the diverse components of complex clinical challenges, patient variables, surgical skills, and limitations thereof; performance anxiety; intensive technical needs; interdependence on the individual skillsets of the team members; and administrative factors conglomerate a complex ecosystem that is so ripe for stress.[2-4] Surgeon, the so-called "captain of the ship," bears the brunt of physical and psychological stress in the setting of the operation theater. Some of the potential stressors for the surgeon include training level, the complexity of the procedure, patient expectations, intraoperative bleeding, problems with surgical equipment, time constraints, distractions in the operation theater, and the presence of unacquainted observers [Table 1].[3-5] While arousal and alertness are the necessary prerequisites for good performance, a high level of stress can impact and impair the surgical performance, judgment, and decision-making skills and thus, patient safety.[4,5] Occupational stress does affect long-term health and increase the risk of morbidity and mortality.[4]

## How is Stress Quantified?

Stress being multifactorial and its impact diverse, its measures are many and can be subjective or objective. Subjective assessment of stress is typically performed using questionnaires (State-Trait Anxiety Inventory score and Visual Analog Anxiety Scale score) and interviews. Objective physiological measures of stress include heart rate and blood pressure (endogenous catecholamine release), heart rate variability (sympathovagal balance), skin conductance level (sympathetic activity), salivary and serum cortisol and serum prolactin level (neuroendocrine response),[3] and the novel stress-related signals in the intraoperative electroencephalogram.[6] Unobtrusive wearable devices capable of acquiring multiple bio-signals may make the objective measurement of stress simple and personalized.[7]

## Do Ophthalmologists Suffer Stress?

Ophthalmologists are not immune to stress. The need for multi-sense coordination and a degree of ambidexterity, delicate nature of ocular tissues, potentially low margin of error, dependence on machines, the expectation of patients in terms of immediate and optimal results, and the outcomes of the surgery being measurable and readily apparent to the patients, all drive up stress for an ophthalmologist. Documented intraoperative stressors in cataract surgery include advanced patient age, the severity of nuclear sclerosis, profound visual loss, floppy iris syndrome, morbid obesity, type of anesthesia, anatomic characteristics (a right-handed surgeon operating on left eyes, deep-set eyes, and small palpebral fissures) and the overall complexity of the procedure.[8-10] Although there is no firm data yet, it is logical to expect that the level of stress may

**Table 1: Intraoperative stressors**

1. Emergency cases
2. Surgical complications
   - Surgical error
   - Unexpected bleeding
   - Difficulties finding the source of a problem
   - No progress
3. Advanced tasks
   - Complex or rarely performed procedure
   - High-risk patient
   - Time pressure
   - Immediate decision making
4. Equipment problems
   - Missing equipment
   - Equipment failure
   - Unfamiliar equipment
5. Administrative and operation theater management problems
   - Delayed start and poor time management
   - Long turnaround time between surgeries
   - Suboptimal administrative support
   - Lack of resources
6. Teamwork problems
   - Poor assistance
   - Incompetent staff
   - Inexperienced staff
   - Language problems
   - Staff paying no attention
   - Interpersonal issues
7. Distractions
   - Noisy operation theater environment
   - Cluttered operation theater
   - Talking noises
   - People walking in and out
   - Bleeps
   - Phone calls
   - Multitasking - simultaneously running multiple theaters, seeing outpatients, teaching, nonclinical work, etc.
8. Personal factors
   - Tiredness
   - Hunger
   - Illness
   - Physical discomfort
   - Personal-life distress
   - Performance/observer anxiety or live televised surgeries

Adapted from Wetzel CM, Black SA, Hanna GB, Athanasiou T, Kneebone RL, Nestel D, Wolfe JH, Woloshynowych M. The effects of stress and coping on surgical performance during simulations. Ann Surg. 2010 Jan;251(1):171-6

be more in complex refractive, corneal, glaucoma, vitreoretinal, pediatric, and ophthalmic plastic surgeries as compared to that in routine cataract surgery.

## Stress Immunity – Is it Feasible?

The cumulative experience of intraoperative high-stress situations helps the surgeon learn and grow to develop enhanced situational awareness and master cognitive dominance.[11] Most surgeons do acquire and perfect their stress-coping skills over time and pass these on to their mentees.

The role of detailed preoperative evaluation of the patient by the surgeon, risk stratification, appropriate patient counseling, and operation theater preparedness in alleviating intraoperative stress cannot be overemphasized. Some of the immediate preoperative measures include visualizing and mentally rehearsing the procedure (virtual surgery) if the surgery is complex or is relatively rare, having an alternative plan in mind, time-out before the surgery to go through the safety and preparedness checklist, sharing the critical aspects and key requirements of the procedure with the team, and a good anesthesia and posturing support to make the patient comfortable.[5,11]

Intraoperative stressbusters include attention to ergonomics; uncompromised light, visualization, and magnification; refocusing on the task if distracted; deep breathing; maintaining constant communication with the team and by name; verbalizing concerns; sharing the details of the surgery with the assistants and trainees; conforming to standard protocols; optimal hemostasis throughout the procedure; maintaining a steady pace; pausing and slowing down when necessary; being aware of the limitations of self and requesting cross-specialty assistance when needed; a breather between cases by allowing the assistants to complete the procedure once the vital steps are over; bright, quiet, and comfortable room environment set to an optimal temperature; minimal movement of the staff and distractions in the line of sight; a friendly team with a positive vibe; and perhaps soft music add to provide the much-needed operation theater nirvana.[5,11] Operation theater, being the temple for a surgeon, its peace and sanctity should be maintained. Being able to operate under stressful situations without adverse impact is the virtue of an experienced surgeon.[3] While nothing can be a substitute to personal experience, incorporation of formal training in stress management and simulation exercises as part of surgical training can help inculcate these vital survival skills early in the young trainees. Cultivation of habits of personal renewal, emotional self-awareness, connection with professional and personal support systems, and genuine professional happiness are the long-term measures that seem to help.[12]

## Conclusion

It is said that the fear of the wolf makes it more dangerous than it is. Stress being an inevitable part of a surgeon's life, we must learn what causes us stress, what its effects are on us, and what could be the possible remedial measures, and learn to ride it gracefully rather than succumb to it. Incorporating stress management skills in daily practice may help keep the healer healthy and happy.

*"Stress should be a powerful driving force, not an obstacle"* – Bill Phillips

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