How to improve your performance as surgeon -What we can learn from athletes:

With that in mind, here are 10 key areas of athletic refinement, along with surgeon-specific tips for improvement:

1. Sleep

Athletes have long embraced the power of sleep, as evident through their use of sleep metric measurement and sleep coaches. Surgeons, however live with the burden of unpredictable hours, and a good night's sleep can be an afterthought. Nonetheless, there is a real performance cost to sleep deprivation. Consistent, restful sleep can improve day-to-day, high-level functioning.

Most surgeons can probably find ways to improve their sleep. Aside from getting more, getting better sleep is typically the lowest hanging fruit. Merely fine-tuning sleep hygiene can have an incredible impact on performance and stamina.

2. Directed Exercise

I once shadowed a well-regarded plastic surgeon. Instead of the expected surgical pearls, he discussed the details of his exercise regimen. He considers exercise so critical for peak surgical performance that he mandates his fellows meet regularly with his trainer!

Surgery requires physical fortitude and precision, whether it's maintaining posture, lifting and lowering instruments, or fine motor movements. Perhaps more critically, a sound body supports a sound mind. Spend some time developing an exercise routine that addresses your surgical demands, or invest in a trainer to help you formulate a plan. Flexibility-based training, like pilates and yoga, can support joints heavily taxed by long, unnatural intra-operative posture. In addition to improved performance, these exercises can foster career longevity.

3. Equipment

Have you ever seen a tennis player without her own racket? Or runners who share shoes? Even professional chefs have their own knives. But a minority of surgeons own personal equipment. We're doing carefully calibrated work after years of training only to use whatever shared tools happen to be next available from the sterilizer.

The comfort, familiarity, and precision of equipment is vital. There are obvious limitations to a surgeon's ability to own equipment, but there is ample room for improvement. Company representatives at meetings can help start a set (or maybe two, for quicker turnover) with targeted purchases, focusing first on the most critical instruments. Usually a quick conversation with surgical facilities will clear up the logistics of using your own set.

Ancillary items like scrubs can play as big a role in maximizing performance. Invest in those that are comfortable for a full day in the OR (some excellent options are here, hereand here). Hospital scrub regulations can sometimes be bypassed by finding a similar color to the house selection.

4. Mindfulness

After recovering from an injury, I recently met with a running coach for refinement and strengthening. He believes endurance is directly proportional to ability to maintain low-impact form. "Once your brain loses focus," he said, "form deteriorates, quickly leading to strain and fatigue."

Those words hold true for surgery, as well: performance directly correlates to endurance of focus.

Relaxed focus is a skill that can and should be cultivated. A daily mindfulness practice — as simple as spending 10 minutes focusing on your breath — is bound to improve surgical performance. If you're looking for structure, apps like Headspace and Calm are a good place to start.

It's equally important to cultivate an environment that's conducive to focus. You don't have to work in silence, but incorporating music (or lack thereof) may help you relax and melt into the "flow" of a surgical day. Be open with OR staff about your needs regarding distractions, like noise. Avoiding other tasks while operating is a no-brainer: fielding non-urgent messages and phone calls may seem efficient, but this is generally misguided. When changing focus from one area to another, the brain suffers a task-switching cost, leading to inefficiency in performance.

5. Visualization

Visualization, a close relative of mindfulness, involves imagining a sequence of events before the real performance. It is a vital tool for professional athletes as it builds and reinforces neural networks that are similarly stimulated through actual practice. One study shows weight-lifting visualization alone can increase muscle mass. Visualizing a positive outcome can also align one's energy with the result, making this preferred outcome a self-fulfilling prophecy.

Spending a few minutes walking through a case in your mind — *before* surgery — is a powerful performance enhancer. It's most effective if you can incorporate as many aspects of the holistic experience — from speaking to the patient beforehand to walking confidently into the OR. It's critical to imagine not only actions but also feelings of confidence, energy, relaxation, and focus. Even when faced with emergency add-ons, spending a few minutes on visualization prior to the case can make a huge impact.

6. Rest & Recovery

Deliberate rest and recovery is important for elite athletes, whether it's a quick break between sets, an off day after lifting weights, or a well-timed massage. By allowing the body to physically and mentally synthesize gains, calculated rest and recovery is criticalin maintaining and enhancing performance.

Embrace this concept with staggered surgery days, regular vacations, or active recovery like massage or acupuncture. Although we take pride in being superhuman, our medical training allows us to understand (better than most) that body and brain need rest and care to attain peak performance. A "break" is most effective when both physical and mental, so it's also important to schedule time without digital stimulation like social media or email.

7. Teamwork

Teamwork is the key to athletic greatness. Even in non-team sports, athletes commonly attribute performance to non-traditional "teammates" like coaches, trainers, and family.

Teamwork in the OR has been emphasized as critical to patient safety and outcomes. The requisite peri-operative timeout speaks to this. But your surgical team includes those outside the OR, as well. The surgery scheduler, medical assistant, and instrument tech can all impact your performance by streamlining workflow. Recognizing and honoring their work — and the work of every individual connected to your surgical success — will only improve your performance by cultivating a vested interest in your team.

8. Streamline

Humans are limited in bandwidth. Across a given time, energy to deal with physical tasks and mental calculations is a finite resource. "Decision fatigue", which involves the deterioration of thoughtfulness with increasing quantity of decisions, is a related phenomenon. Recognizing this, athletes (as well as CEOs, politicians, and other peak performers) outsource or streamline as many non-pertinent tasks as possible.

Efficiency involves systems and routines that offload and automate tasks that expend brain power. This certainly encompasses the aforementioned team approach. But this can take other forms, such as OR checklists (another Gawande point), which unburden recall energy to a simple list. There are also simple lifestyle changes that can preserve crucial brain power, such as having a uniform or weekly meal-prepping. An entire digital outsourcing industry, including virtual and local personal assistants, can deal with repetitive tasks like reservations and grocery shopping. Leveraging these services to do your busywork may seem a wasteful luxury, but freeing up space and time will lead to long-term (and lucrative) gains in performance.

9. Studying Performance

A key component to elite performance is the study of one's own data. In sports, this involves reviewing video or post-game debriefing with coaches or fellow athletes. Studying successes along with failures, and making appropriate changes, is an efficient method of optimizing performance.

Aside from the operative note, spend a few minutes after each case jotting down key maneuvers, new instruments, or any other pertinent details. Depending on your field, perioperative photography can provide tremendous data. It can also be valuable to record how you *felt* about a

particular case, along with other seemingly irrelevant data like staff, time of day, and even the particular operating room.

Refer to these details as you track patients, and regularly dedicate time to finding correlations. Even without formal statistical analysis, you may be surprised by certain trends that can inform your behavior and technique. Perhaps a patient recovers faster or has less pain when you avoid a certain maneuver. Is there a time of day or particular operating room that optimizes performance? Keeping up with the literature is vital but, as a surgeon, the most valuable data is your own.

10. Diet

How diet relates to mental performance is informed by a body of literature doctors helped to create. So why do we ignore this science? We know that increased consumption of simple carbohydrates is detrimental to memory and processing. And wild swings in insulin related to sugar consumption can cause sluggishness, as can dehydration. Yet we grab a danish and a cup of orange juice after Grand Rounds on our way to a full OR day.

Take stock of your diet, especially on surgical days. Eating a breakfast high in protein and healthy fat and low in carbs can help sustain you throughout the day. Pack the meals and snacks you'll need, or at least have a plan to get something healthy nearby. Keep a bottle of water in your bag, too.

Stress and exhaustion lower willpower, so having healthy foods ready will short-circuit your saltine packet consumption. Stay hydrated and monitor your caffeine intake. During a long case with a stable patient, don't be a hero. If you need sustenance, take a quick break to eat a high

protein snack and drink a cup of water. The five minutes of lost operating time will be more than made up in improved performance.

Go Easy

When attempting to foster new routines and behaviors, the key is to start slow. Instead of doing a full overhaul, cherry-pick one or two simpler changes while monitoring your performance. Don't get discouraged by short-term inefficiencies: as a new habit forms, you'll undoubtedly notice incremental improvements in performance. And hopefully the joy of surgery.

Now, about getting *paid* like professional athletes.

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