The OMS office-based anesthesia team model has been documented to be a safe method of anesthesia delivery. It is tempting to think that after years of practice without a serious adverse event, the anesthetic team "has what it takes" to ensure a crisis-free future. Unfortunately, as stated by James Reason, "It is hard to fear things that rarely happen." Given that oral and maxillofacial surgeons work in a low-incidence, high-consequence environment, a sense of humility is important as is the need for the anesthetic team to be prepared to respond to a crisis event if / when one occurs.

Practice

Most OMSs are comfortable learning about what to do in the case of an anesthetic crisis, which generally means attending lectures, reviewing resources such as the AAOMS *Office Anesthesia Evaluation Manual* or otherwise talking with colleagues about what to do when adversity occurs. While this type of traditional education plays a role in building and reinforcing "knowledge," when it comes to developing, honing and applying skills, evidence suggests such approaches are not effective over time – particularly under challenging conditions. What have been shown to make a difference are learning experiences that have an interactive component. It is experience with mentorship, feedback and corrective action that is most effective. In essence, this is what "practice" provides. Many equate practice (training) to the mundane/rigid activities they encountered as a participant in youth sports, music lessons or other practiced interests or skills. However, research on what prepares individuals and teams across diverse disciplines to perform effectively indicates that specific types of practice can be both engaging and productive. In healthcare, most such research has taken place in emergency medicine and anesthesiology. However, the principles identified as effective in every discipline apply readily to the OMS anesthesia team.

The following summary explains the key elements that lead to effective performance (favorable outcomes), where knowledge, skills and self-efficacy can be built through effective practice:

Outcome / Performance =
Knowledge + Skills + Self-efficacy - Interferences

The goals of practice include:

1. Making sure everyone knows where necessary pieces of equipment and medications are located and how they are used.

2. Developing cohesion as members of a team with an understanding of the goals and roles of each team member.

3. Identifying areas that need improvement with a plan to correct them.

4. Moving through different stages of learning, from *unconscious incompetence* (you are not able to do something and have little of idea what you are supposed to do), to *conscious incompetence* (you understand what needs to be done but are not able to do it), to *conscious competence* (you are aware of what needs to be done and are able to do it with conscious effort), to *unconscious competence* (you both know what to do and are able to act without conscious effort). While individuals progress through this process at different rates, practice can move anyone toward more competent performance.

While individuals progress through this process at different rates, practice can move anyone toward more competent performance.

Unconscious Incompetence ➜ **Conscious Incompetence** ➜
Conscious Competence ➜ **Unconscious Competence**

Practice can be thought of as having two primary components:

- **Drills** – Activities that enhance the skills necessary to perform effectively. An analogy might be a basketball player practicing foul shots, working on routines and mechanics. Drills help individuals learn proper technique through repetition and feedback.

- **Scrimmages/Rehearsals** – Activities that involve applying knowledge and skills to simulated challenges. They should be as realistic as possible, mimicking the challenges seen during a crisis. Consider a basketball player taking shots after catching a pass with a defender applying pressure. The player who

first developed the skill of shooting through drills now applies those skills under more challenging circumstances.

Drills

The following should be considered when conducting office drills:

- **Practice the "20"** – Focus 80 percent of time and attention on the 20 percent of knowledge/skills that have the most impact. These should be practiced to a mastery level in an effort to move participants to a place where execution of said drill becomes automatic.
- **Differentiate "drills" from "scrimmages"** – Focus on practicing small skills, such as accessing the crash cart, both while other team members aren't present and – in a version close to the real thing – with the drills as "hands-on" as possible. An analogy might be an actor memorizing his/her lines first (drills) and later progressing to using then in a formal rehearsal.
  - › **Isolate the skills** – Break skills/tasks down into small sections and practice each part in isolation until competency has been accomplished.
  - › **Integrate the skills** – Create opportunities that are as close as possible to real situations, including environments and human reactions.
- **Measurable objectives** – Set objectives that are measurable, such as intubating a manikin or accessing and activating an automated external defibrillator (AED) within a specific amount of time.
- **Modeling** – Demonstrate how and what needs to be done, down to the important details. This is best done in a context as similar as possible to the one in which team members are expected to perform, such as positioning the operating chair in a position that would allow CPR to be performed.
- **Encode success** – Once the team has established what the right thing to do is, be sure it is being done correctly. Do not increase difficulty until the team and/or individual member is ready.
- **Feedback** – Support a culture where team members are comfortable accepting and providing feedback. Challenge one another to try different skills or things – even if they make mistakes – with correction before the wrong application becomes ingrained. **See Appendix B.**

- **Correct rather than critique** – Do not just critique; instead, provide guidance to members of the team redoing the skills/tasks until improvement is demonstrated.
  - › **Describe the solution, not the problem** – Use specific and actionable instruction and/or descriptors.
- **Praise** – Use praise to identify specific successes. Acknowledgement is given when someone meets expectations; praise should be given when someone exceeds expectations.
- **"Inter-leaving"** – Practicing multiple skills by shifting or changing back and forth from one skill to another has a more long-lasting impact than focusing on one skill at a time.

Scrimmages

While simulation-based scrimmages led by an expert outside administrator are ideal, they are not always feasible. Fortunately, less high-fidelity practice has been demonstrated to be more effective than conventional instructive teaching, with increased engagement during the learning process and improved acquisition and transfer of knowledge.

Scenarios used to guide scrimmages should center around the types of patients the office typically treats, including age group, medical and physical status, and procedure types. Scenarios should be as realistic as possible, mimicking the kind of challenging environmental circumstances that often accompany crisis situations. While scenarios should generally focus on events occurring in the operating room(s) where anesthetics are administered, they also should include other areas of the office such as the front desk and waiting room, the recovery area, hallways and bathroom. Avoid using overly overused descriptions, favoring creative scenarios that encourage active assessment and re-assessment with ongoing engagement of the team. Challenge team members to participate in the development of the emergency scenarios; encourage to imagine the unimaginable. **See Appendix C**.

Emergency office drill algorithms for specific crisis events can be found in resources such as AAOMS's *Office Anesthesia Evaluation Manual* or Stanford Medicine's complimentary *Emergency Manual*. In the effort to give the scenario life, include descriptions of the patient, procedure performed, signs of the event, etc. For example: A 48-year-old male

presents for extraction of nine teeth with immediate placement of four implants utilizing moderate sedation and local anesthesia. His past medical history might include hypertension, diabetes mellitus and seasonal allergies. The patient takes 5 mg of amlodipine for hypertension daily and 500 mg of metformin twice a day (b.i.d.) for control of his blood sugar. His most recent HbA1c is 8.0 and BMI is 32. A scenario such as this allows for progression through a variety of possible crisis events along with an opportunity to discuss risk factors and check to see how preoperative assessments might have prepared the team in advance for possible events. In an effort to make the practice as realistic as possible, the team should use a CPR/airway manikin and carry out the tasks that would be required during a crisis event, such as performing CPR, managing the airway, establishing IV access, connecting IV tubing, drawing up "mock" drugs, etc. Non-clinical personnel also should participate, assisting in designed ways such as calling emergency services, waiting outside the building to direct paramedics, dismissing unrelated individuals from the waiting area, etc.

As much as possible, scrimmages should approximate an environment that allows participants to experience the thoughts and emotions they face during a true crisis, including mental and physical stress. Adding stress to the practice environment might come through setting measurable goals such as having to complete all the important steps/elements of the response to a specific mock crisis in a defined time. Other ways to increase stress include recording sessions to be reviewed later or having an outside observer attend the practice, with feedback provided after the session. As a result of adding stress, members can learn to adjust their response to stressful events, mentally processing them as challenges (eustress) rather than feeling overwhelmed (distress).

Variations of Practice

The power of practice is dependent on several factors. Common versions include:

1) The "traditional" approach of the staff practicing together following the OMS's lead. Typically, this means working through algorithms of common crisis events. The primary value of this approach is the opportunity to rehearse roles. It also allows the team to identify shortcomings, identify where items are (e.g., equipment, medications) and experience how to successfully work together.

2) Bring in a qualified individual from the outside to conduct, observe and provide feedback while running through different scenarios. This puts the team under the microscope in a good way. The individual providing outside input should identify what is done well and what could be improved.

3) Enhancing either of the above with video recording allows participants to see what actually happened compared with what they thought took place.

4) While not as effective as interactive practices, there is value in simply talking about what individuals or the team might do, allowing participants to clarify roles and responsibilities and imagine the challenges they might face (mental rehearsals).

Regardless of the variation employed, practice sessions should:

- Be conducted on a regular basis.
- Be planned with the needs of your team in mind.
- Challenge participants both physiologically and mentally, mimicking real-life situations.
  - › Going through the motions does not lead to improvement.
- Incorporate a level of stretch for individuals and the team.
- Include constructive feedback while not overlooking shortcomings.
  - › While feedback should always take place after practice and include everyone, there is a place for feedback to be given during a practice session.
- Focus on fewer important things rather than many different ones.
- Encourage adaptive thinking by periodically halting proceedings to ask participants, "What do you think about what is happening?" and "What will you do next?"
- Understand there is a difference between "doing" and "learning."
  - › Just because someone can do something does not mean they have understood.
- Require participants to think by asking questions in a safe environment, emphasizing that mistakes lead to learning opportunities.
- Encourage a growth mindset; effort and learning are more important than outcomes while embracing challenges as an opportunity to improve.

- Help them get better as individuals, demonstrating each person's importance as a member of a high-functioning team.
- Allow team members to practice in a way that is applicable to real-world events, introducing cognitive stress through spacing, variability and challenge. **See Appendix D**.
- Incorporate team-building elements.

Deliberate Practice and 'Flow'

Research has consistently identified two elements that make high performance and positive outcomes more likely: 1) deliberate practice and 2) being in a state of "flow."

Deliberate practice is characterized by intentional design, graduated difficulty (stretch), immediate and constructive feedback including debriefing after the drill, and repetition in the effort to correct shortcomings with reinforcement. **See Appendix E**.

Flow has been identified as a highly productive state of consciousness where individuals become totally absorbed in an activity, providing a platform to act without the interference of outside thoughts and emotions. Being in flow allows teams to do more than simply know what to do; it allows them to put into action what they know needs to be done. Flow has been demonstrated to occur and enhance performance for individuals as well as groups. Several elements are associated with being in flow. **See Appendix F.**

For crisis training purposes, the most important are: 1) a balance between the challenge and the skills the individual has, 2) clear goals, and 3) the ability to tune out distractions and pay attention to the process rather than the outcome of any event. Challenges must be attainable but represent a stretch for the individual. If the stretch is too much, individuals become frustrated; if too little, they become bored or overly confident.

Mental Representations

Skills and knowledge represent portions of related components (chunks) possessed by an individual or team. They are stored in long-term memory, available to be retrieved and applied to a given situation when needed.

In addition to possessing the necessary knowledge and skills, it is equally important to be able to recognize what matters and what doesn't as a crisis unfolds. Experts see

more with less effort and are better able to distinguish the important from the unimportant. Such experts are better able to interpret what is happening and apply their knowledge and skills. They are said to have strong mental representations. Building mental representations requires doing things (actions) more than thinking about them. Practice helps not only build knowledge and skills, it also provides an opportunity to see how such skills and knowledge can be assembled to lead to productive appropriate actions. Going through the process of addressing a mock crisis helps to not only build a library of resources, it also allows everyone to see how they fit together in a coherent manner.

Managing the Moment

Published literature reveals several realities about performing under duress in a healthcare environment: 1) stress is common; 2) stress degrades performance; 3) most practitioners who have figured out how to perform well under stress have done so through experiential learning; 4) practice offers an opportunity to engage trainees in individual and team learning experiences that provide them the foundation to perform effectively; and 5) the value of practice is closely related to the quality and – to a lesser degree – quantity of the simulations, drills or scrimmages.

Once an individual has acquired an appropriate level of knowledge and skills, what matters is his or her ability to access it in the face of stress. It is wise for OMSs and their team to embrace mental skills training as a part of their professional development. This can be as straightforward as learning to control breathing patterns to manage physical and mental responses to challenges (exhaling longer than inhaling reduces heart rate and improves focus) or reframing what is taking place to turn "stress" into a "challenge." An example of reframing would be: "I recognize this is a stressful, high-stakes moment, BUT/AND I have practiced and have the knowledge and skills needed to handle the situation." This approach recognizes there is a challenge and then shifts the focus to what the individual is capable of.

Suggested Readings

Coyle, D. (2009). *The talent code: Unlocking the secret of skill in math, art, music, sport, and just about everything else.* Random House.

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Lemov, D., Woolway, E., & Yezzi, K. (2012). *Practice perfect: 42 rules for getting better at getting better.* John Wiley & Sons.

Lipshy, K. A. (2013). *Crisis Management Leadership in the Operating Room-Prepare Your Team to Survive Any Crisis.* Creative Team Publishing.

Mumford, G. (2015). *The mindful athlete: Secrets to pure performance.* Parallax Press.

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Appendix A. Self-efficacy (Bandura)

Self-efficacy is more resilient than "confidence." It is built in several ways, all of which can be incorporated into a thoughtful practice session. Elements include:

- **Mastery experiences** – Performing a task successfully strengthens self-efficacy.
- **Social modeling** – Seeing people similar to ourselves succeed raises our belief that we also possess the capabilities to master comparable activities.
- **Social persuasion** – Verbal encouragement helps individuals overcome self-doubt, allowing them to increase their sense of self-efficacy.

People with a strong sense of self-efficacy:

- Develop deeper interest in the activities in which they participate.
- Form a stronger sense of commitment to their interests and activities.
- Recover more quickly from setbacks and disappointments.
- View challenging problems as tasks to be mastered.

People with a weak sense of self-efficacy:

- Avoid challenging tasks.
- Quickly lose confidence in personal abilities.

Appendix B. Debriefing

Debriefings should be held after practice sessions with a focus on:

- Was communication between team members clear?
- Were roles and responsibilities understood?
- Was situational awareness maintained?
- Was the workload distribution equitable?
- Was task assistance offered or requested?
- Were resources readily available?
- What went well?
- What can be improved?

Appendix C. Cognitive Stress

To practice effectively and in a way that applies to the real world, introduce cognitive stress through spacing, variability and challenge as follows:

- **Spacing** – Increasing the space between challenges, increases cognitive stress and the ability to recall previous successful efforts. An analogy might be in golf, hitting 20, rather than 40, balls over 20 minutes on the practice range. In our arena, this might mean slowing down the team's actions to focus on individual components, or performance.
- **Variability** – Changing, even slightly, what someone does in a session provides cognitive stress, which enhances the memory process. Keeping with a golf analogy, this might mean changing the club you are hitting, the lie from which you are hitting or the target you are hitting to between practice shots. In the OMS arena, it might mean changing up the course of a scenario to provide a greater challenge. For example, the leader of a bronchospasm simulation might introduce an arrythmia to the narrative.
- **Challenge** – Setting outcome goals is one way to elevate your challenge. In golf, this might mean making at least 6 out of 10 putts from 8 feet. Once achieved, elevate the number to be made, the distance the putt is taken from, etc. In the OMS arena, it might mean the team begins bagging the manikin without anyone doing CPR, providing only airway support, until the scenario changes requiring continuation of providing airway support by bagging the manikin while another person is performing CPR.

Appendix D. Principles of Team Response

Response to a crisis event should include:

- Accepting that something is *NOT RIGHT OR WRONG*.
- Taking actions that are deliberate and positive.
- Being open to alternate explanations of the situation through ongoing reassessment.
- Communicating in clear and effective ways (closed loop).
- Allowing members to be empowered to articulate observations or suggestions.
- Recognizing and managing team members' anxiety.

Appendix E. Characteristics of Deliberate Practice (Ericsson)

Traits of deliberate practice typically include:

- Takes place outside one's comfort zone, challenging participants to try things beyond their current abilities.
- Requires high levels of focus and concentration. Participants should be "absorbed" in the practice. Being clear about why the team is practicing facilitates motivation.
- Has well-defined, specific goals, not simply aimed at vague improvement. Once an overall goal has been established, identify smaller goals that together will result in a desired change.
- Involves building on or modifying previously acquired skills, focusing on specific aspects that can be improved. Because new skills are built on top of existing ones, it is important beginners have the correct fundamentals.
- Understands that putting in time alone does not lead to meaningful improvement.
- Must be reinforced over time, not just a one-off effort.
- Requires continuous feedback. At first, this should come from a leader who monitors progress, points out problems and offers ways to improve. Over time, individuals learn to monitor themselves.

Appendix F. Elements Common to "FLOW" (Csikszentmihalyi)

The following elements can be attributed to the highly focused mental state of "flow" that is conducive to productivity:

- **Challenge - Skills (CS) Balance** – A productive balance between challenge and skills is the golden rule of flow. It is important that one perceives their skills as adequate to meet the needs of the challenge, growing them as necessary through drills and practice.
- **Action - Awareness Merging** – Instead of the mind looking at the body from the outside and being judgmental, the mind and the body act together to perform to their limits.
- **Clear Goals** – Goals should be clearly set so that individual members know exactly what to do. Clarity of intention helps to focus attention and avoid distractions. If something turns wrong or is unexpected, it does not have to mean flow is destroyed; it means a shift in attention is necessary to do what is needed next.
- **Unambiguous Feedback** – Feedback is not always available during a crisis, given the inherent uncertainty of such events. Nonetheless, after practice, participants should receive feedback through a debriefing.
- **Concentration on the Task at Hand** – Focus needs to be complete, without extraneous thoughts that might distract from the task at hand. Understanding that crisis events are generally unexpected and often unpredictable, it is critical to be able to set aside distractions, eliminating irrelevant thoughts from consciousness.
- **A Sense of Control** – Individuals should have a sense of having the resources available to them that allow them to cope with whatever comes their way. The sense of control frees them from fear of failure. While individuals do not control every aspect of what happens, they do have control over where they put their attention. Trying to control things they do not have control over often leads to worrying about possible negative outcomes.
- **Loss of Self-consciousness** – Concern for the self disappears as do worries or negative thoughts, which frees the self to become totally involved in the activity.