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STUDYING HIGH PERFORMANCE TEAMS

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PROFILING THE EMERGENCY DEPARTMENT PHYSICIAN

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INTRODUCTION

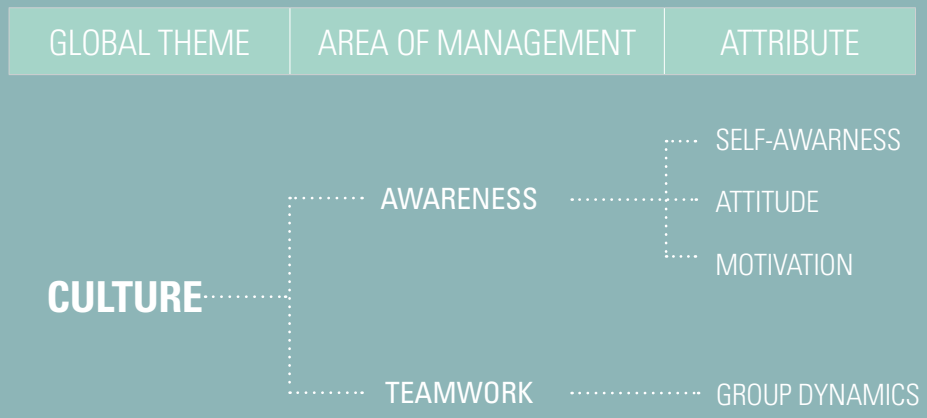
Profiling is the act of extrapolating information about a person based on known traits or tendencies (Merriam Webster, 2012). The use of performance profiles in sport has been well documented (Butler & Hardy, 1992; Jones 1993), and provides an efficient tool for highlighting strengths, weaknesses and allowing performers to focus in on areas for development. Like the use of any model, they make generalizations and simplify complex issues and challenges. The aim of the model shared in this article is to provide a structure to critique and create a reference point for discussion on the mental skills used by Emergency Department (ED) physicians.

The aim of this article was to build on the Mugford and Temple *(if accepted 2013b)* case study on the demands of ED physicians. In observing high performance teams like this, great insight can be gained about the mental skills and ability to deal with a particularly challenging work environment. In order to draw comparisons with a working model in sport, the model of mental conditioning from the IMG Academy is used (Mugford, Morgan, Lifrak, Smith, Da Silva, Le Vine, Andreoli, Hesse, & Moawad, 2012), which also draws from the influence of Holliday, Burton, Sun, Hammermeister, Naylor, & Freigang (2008). Note that these insights are not supposed to apply to all ED departments, let alone all ED physicians or teams, but simply based on a single case study where we can look and begin to understand how these individuals develop excellence. Here we arrive at two important questions, specifically, what can be learned and transferred to other disciplines and where are there opportunities for high performers in medicine to continue to develop?

BREAKING DOWN THE STRUCTURE

There are three global themes based on the work of Mugford et al (2012). These are the 'Culture', 'Skills' and 'Plans' associated with mental conditioning and mental performance. Each will be broken down further, with discussion expanding on the applications and relevant points in Emergency Medicine.

TABLE 1: **CULTURE**



CULTURE

'Culture' refers to the integration of an individual's beliefs, knowledge or behavior into a group or environmental context. This theme encapsulates awareness and also teamwork. Awareness is more accurately defined as 'awareness management', since the theme and philosophy behind the IMG approach is to empower performers with the ability to self-regulate and manage these as a set of skills. Awareness focuses on both an internal and external environment, particularly understanding one's own values, motivation and attitude and how that fits in a performers contextual reality. Table one represents the global theme and fundamentals that compose each theme.

SELF-AWARENESS

The ability to develop self-awareness is largely driven by feedback. That maybe external through supervisor feedback in the developmental phase of a resident, through patient feedback and clinical outcomes, or peer and staff feedback. Video analysis is also sometimes utilized in case simulations, where as a medical student, or resident, the physician would execute a simulation in front of a class of peers, followed by a video debrief with an instructor and peers on their performance. Internal awareness can be further cultivated through self-reflection, an important aspect of the learning process, but far less formalized in nature and structure. Many departments differ with the provisions of feedback, but a typical teaching hospital may provide evaluations written by attending physicians after every shift (although only approximately 10% involve truly meaningful constructive feedback). Annual peer evaluations are written and include questions like, 'Would I want to work with this person? Would I want a family member to be seen by this physician?'

ATTITUDE

Defining attitude is a challenging task. From the perspective of IMG, we define this as 'the perspective an individual holds toward any given situation'. In the ED world, one of the challenging factors of the environment is that there are frequent potentially negative interactions with patients seeking narcotics, others suffering from mental health issues, or patients with a strong sense of entitlement, creating an environment that can make be hostile or difficult. When regularly exposed to this, it can lead to a high degree of cynicism and ultimately burnout (Cole & Carlin, 2009). There's the potential for a paradox here, because the ED physician is exposed to the most extreme of perspectives in their daily job. Specifically they deal with patients in extreme pain, and issues of life and death regularly, which could lead to a healthier perspective on the triviality of other stressors and pressure. Having said that, the choice of how one looks at these situations, with a positive or negative perspective can certainly impact the stress of the job.

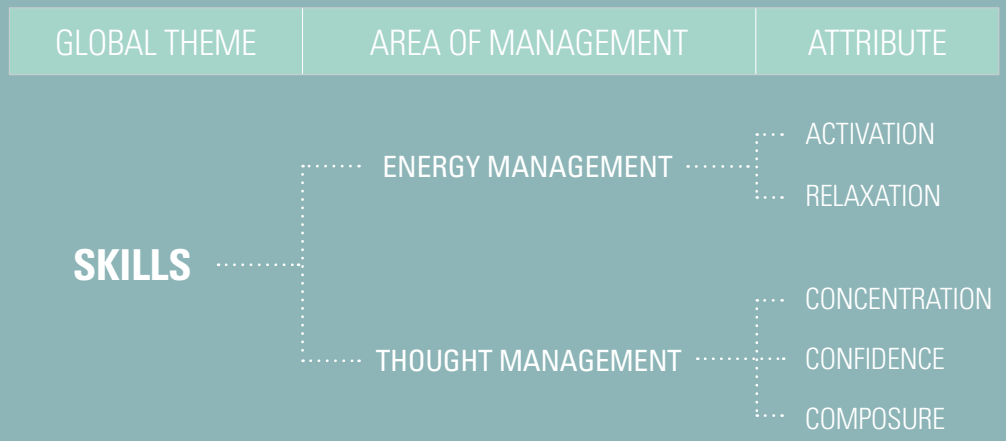
MOTIVATION

Those who make the long journey through medical school, residency and become attending physicians have demonstrated a high level of competence and an ability to persevere through many challenging exams, long hours and intellectual and emotional hurdles. Motivation is needed at every stage of this process, and maybe different for everyone. For some, this may be extrinsic and the goal is the security and standard of living that comes with becoming a senior physician. For many, the primary motivators are more intrinsic and emphasize the care for their patients and being able to positively influence and save lives. For many others still, this motivation may change and shift as they go through the various stages of development. What does seem consistent is that many physicians are highly competitive, with a strong sense of pride, and a frequent use of goal setting. These goals can include productivity, seeing as many patients as possible, while still maintaining a high quality of care. Ultimately, when the goal is to achieve optimal performance it does not matter what someone's motivating forces are, even if a patient may want to hear that their doctor is primarily motivated to provide care. For the physician however, it is important to know their motivators and to be able to manage their thoughts and energy based on what inspires or activates them. Goals also have a direct impact on confidence and perceived stress based on goal achievement and also the locus of control and ability to influence outcomes.

GROUP DYNAMICS

It is clear that performance in the ED is very reliant on effective teamwork. The communication and professional relationships between ED physicians, nurses, technicians, administrators, consulting physicians, and more all determine the successful outcomes of patients. As with the research in sport environments and teams (Carron, Colman, Wheeler, & Stevens, 2002), we know that group task cohesion is a significant factor in optimal performance. Each hospital differs in the culture that is created, largely through the mission of the hospital and also the leadership. An interesting take on this is also that the team essentially changes with each shift change. Just as a substitute coming on to the sport field or court may affect the team, the dynamics of the medical team are also changed. Awareness and the ability to adjust, communicate and function with others become an important skill set for the ED team and research has supported the formal training of teamwork (Morey, Simon, Jay, Wears, Salisbury, Dukes & Berns, 2002). Historically there is a significant amount of separation in the culture of nurses and physicians given the different responsibilities, needs and issues that they deal with on a day-to-day basis. This can certainly lead to barriers in communication and performance if the culture does not effectively deal with this potential gap. Theoretically, the more proactive a team is in developing a positive team culture, the more successful the team performance.

TABLE 2: **SKILLS** – identification and implementation of tools that develop mental outcomes such as confidence.



SKILLS

'Skills' are essentially the process of developing an ability or aptitude (Merriam Webster, 2012). In this context we discuss the use of mental skills or tools that directly leads to improved mental performance. Broadly speaking there are two areas of focus, that is, managing ones energy and also managing ones thoughts. This is assuming a cognitive behavioral model of the world, where we can influence thoughts and behavior. Within this, energy is looked at on a continuum of relaxation and also activation. In managing thoughts, the outcomes of confidence, concentration and composure are achieved through a variety of methods but we need to acknowledge and understand that these are perhaps the single most important three states that lead to optimal performance. Each is discussed below in the context of emergency medicine. Table two represents the global theme and fundamentals.

ACTIVATION

The physical demands of the ED are not necessarily significant, although the physiological demands of rotational shift work can be significant and have the potential to impact decision making ability. Because of this, evidence based approaches carefully study the principles of circadian physiology and individual findings (Burgess, 2007). Indeed, optimal scheduling has been found to promote clockwise rotating schedules for the morning, afternoon and nighttime that specifically limit night shifts to blocks of three, shift durations to typically 8 hours and allowing 3 days of recovery after night shifts. The demands on resident physicians may be much higher, but ever improving guidelines are in place to optimize mental and physical performance. The consequences of non-optimal decision-making can have a pronounced effect in any medical setting, but even more so in an ED. Tyler (2012) discusses that many professionals working with clients experiencing trauma, including social workers, police officers, and ED professionals, not only have to manage psychological, but also the neurobiological symptoms of working with traumatized people. Limbic system activation that manages both the sympathetic and parasympathetic nervous system responses to stress can have different, but potentially equally damaging consequences to performance. If untreated over time, these professionals can be at high risk of experiencing burnout or compassion fatigue, although clearly more research and work is needed in this area. Whether the increased resources and support for managing these stressors can be implemented or its simply a matter of optimizing schedules to help facilitate better recovery and manage sleep, factoring in the neurobiological responses to this work environment are important. Many physicians find their own strategies for coping, such as caffeine or sleep-promoting agents to help manage their energy (Nelson, 2007), many of which may not be optimal long-term solutions. Increasing the opportunity to self-regulate energy is an important skill for physicians. Simply depending on scheduling and artificial agents seems limited given the importance and nature of ED work.

RELAXATION

Given the risks inherent to fatigue and sleep deprivation, hospitals typically provide a great deal of education to physicians regarding optimal sleep, rest, recovery and burnout. Unsurprisingly, the simple process of education is not enough to actually change and manage behavior. Some research supports the fact that medical students and residents enter a culture of expectation for being independent, not seeking help and pushing their limits (Kennedy, Regehr, Baker, & Lingard, 2009). This could easily spill over into the under valued skill of relaxation, because it is not culturally encouraged. In many respects this is true in sports where the concept of 'practicing how to relax' may be seen as radical or unnecessary. The reality is that this skill set is extremely important in stress management and the value of effective relaxation and recovery for optimal performance is well documented (Murphy, 1996).

CONCENTRATION

The ability to focus on what is important is fundamental to being a successful ED physician. Indeed, the ability to prioritize information and patients is critical, especially where life and death decisions can be extremely time sensitive. To safe guard many of these processes, protocols and procedures have been documented to simplify a systematic approach to patient care (Gawande, 2009). Where ED physicians can struggle is with elements that are outside of their control and where it is easy to waste energy and frustration. These can include slow nurses, frustrating patients, or other difficult consultants. The combination of factors can also amplify distractions and loss of focus. Indeed, the work environment of an ED involves a significant amount of multitasking, and the amount of workplace interruptions is extremely high (Chisholm, Collison, Nelson & Cordell, 2000). The higher the seniority, the greater the average interruption time (Laxmisan, Hakimazada, Saya, Green, Zhang & Patel, 2007). The ability to shift focus is therefore hugely important, and while there is clearly a lot of 'on the job' practice for residents and physicians, one wonders how much deliberate practice and concentration training could help improve performance further.

CONFIDENCE

The process of residency and the developmental training that takes place is designed to facilitate competence and confidence in managing acute conditions, performing procedures and general clinical performance (O'Keefe, Mason, Stride, Carter, 2012). Indeed, competence typically precedes confidence, and given that confidence is a belief that one can expect a successful outcome, one needs to build a belief that they can perform procedures or make the diagnosis. Interestingly, some research (Cabana, Rand, Powe, Wu, Wilson, Abboud, Rubin, 1999) suggests that some of the potential barriers to physicians not following clinical practice guidelines include the following: lack of awareness, familiarity, agreement, self-efficacy, outcome expectancy, or ability to overcome the inertia of previous practice. While these are varied, it perhaps emphasizes that there are many factors that go into clinical decision-making where especially confidence is a major factor. Coming back to the process of medical school and residency highlights the importance of regular testing to demonstrate competence, but also the confidence built through both oral and written presentation. Of increasing use in the medical education field is the use of simulation (Bond, Lammers, Spillane, Smith-Coggins, Fernandez, Reznek, Vozenilek & Gordon, 2008), the use of mental rehearsal (Wetzel, George, Hanna, Athanasiou, Black, Kneebone, Nestel & Woloshynowych, 2011) and mental practice (Arora, Aggarwal, Sirimanna, Moran, Grantcharov, Kneebone, Sevdalis & Darzi, 2011). The positive findings and impacts of these skills demonstrate improved quality of performance as well as the coping skills and confidence to perform procedures. As a skill, mental rehearsal can also be particularly effective at managing thoughts before intense traumas, and the opportunity to understand and use positive self-talk and mental rehearsal more consistently could have very positive implications.

Finally the area of social support from peers and supervisors can significantly effect coping skills (Halpern, Gurevich, Schwartz & Brazeau, 2009) and confidence. The value of shared experience and closeness with fellow medical school classmates and residents can also forge strong relationships, particularly when there is significant stress and developmental experiences that occur in a relatively short period of time. Using these networks effectively can also enhance the experience of positive support and self-belief.

COMPOSURE

Many of the factors described with regards to energy management, confidence and concentration apply in the ability to be composed in critical situations. Indeed, IMG define composure as, 'the ability to focus and compete in the face of pressure or adversity'. Perhaps the reason this is a separate category is that it is specific to situations where there is a critical moment, where the execution of performance is absolute. One of the interesting things in the ED is that not all mistakes are obvious or immediate. It may be easy to assume that one of the consequences of life and death decisions made in an ED would be immediate, but in actual fact, it may be some time before mistakes come to light or feedback is given.

In terms of performance, it is clear that concentration and mastery of the intellectual demands is critical. However, an interesting and perhaps controversial area is the idea of dealing with failure. Its not easy for a physician to let go and manage failure, but its also not a comforting thought to have a physician who is struggling to perform due to a fear of failure. A healthy respect of failure and consequences is clearly important, but any performer, that focuses too much on mistakes and avoiding these often ends up focusing on exactly the wrong things, instead of the job at hand. Research utilizing simulation, mental rehearsal and mental practice (Bond et al, 2008; Wetzel et al 2011; Arora et al 2011) all provide a safe opportunity to practice and rehearse critical situations in the same way that the aviation industry leans on training simulations to create adversity and facilitate learning. While emotional factors may be hard to elicit in these simulations, compared to real situations, the ability to train composure through exposure to realistic events is extremely important and where more naturalistic decision making models become more important than artificial 'text book' scenarios (Small, Wuerz, Simon, Shapiro, Conn, & Setnik,1999). Addressing the psychological and emotional factors in performance, means acknowledging the importance of composure and focusing on development as more than just a set of technical skills. Training physicians with the ability to maintain high levels of composure is the ultimate goal, but right now one may ask, how much is through self-selection of highly composed people, how much is a by-product of the training process, and how much is through deliberate and practice and training?

TABLE 3: **PLANS** – The integration of performance into consistent mental game plans.

GLOBAL THEME	AREA OF MANAGEMENT	ATTRIBUTE
PLANS	APPLICATION TO PERFORMANCE	PREPARATION
		ROUTINES
	APPLICATION TO LIFE	PREPARATION
		ROUTINES

PLANS

'Plans' are the organization and strategy to apply mental skills in a relevant context. The application to work performance and to life are discussed here. One of the most important aspects of having strong mental game plans is that they help provide performers with consistent routines and habits of best practice. Table three represents the global theme and fundamentals, while each area is discussed in more detail above.

APPLICATION TO PERFORMANCE

Emergency medicine is highly protocol and procedure driven. The unpredictable nature of the patient population means that by definition, patients don't plan to have an emergency, but once in the ED, the approach is very systematic to maximize safety and effective medical management. Over time, many physicians develop their own self-designed processes (Gawande, 2009), although there could be many opportunities where performance psychology can help improve this. Atul Gawande, a successful cancer-surgeon has also become an acclaimed writer both for the New Yorker Magazine and author or the books 'Complications' (2002), 'Better' (2007), and 'Checklist Manifesto' (2009). In his book 'Complications', Gawande supports the notion that while there are routines and procedures in place, 'there is a lot of uncertainty about exactly what to do'. Further, 'You'd love for there to be clear guidelines for everything, but that's not the case' (p. 24). Managing thoughts, emotions and energy during work performance can help maximize performance and increase consistency over time. The teaching of these routines, such as breathing, self-talk and mental rehearsal are very informal, although empirical evidence from the United Kingdom on surgical teams utilizing these techniques (Wetzel et al 2011; Arora et al 2011), and further focus on the mental training may lead to a more systematic approach to such training. In many respects, this can be thought of as assembling a 'mental game plan' for performance.

APPLICATION TO LIFE

It is much harder to assess the impact of mental training on the quality of life for physicians, than in a clinical setting where empirical evidence can be been increasingly found. If we were to look at the clinical skills that help ED physicians excel, it would seem logical to predict that intelligence, dealing with pressure, prioritizing and managing time would all be strong. Indeed, these all seem like areas that could lead to very effective life skills. Regardless of the validity to this statement, life demands are hugely varied and often hard to predict. Each aspect discussed, from 'culture' to 'skills' and 'plans', highlights opportunities for people to understand their strengths and areas to improve and that these are relevant in regards to performance in an ED, let alone the sports field or in the home environment.

CONCLUSION

Performance excellence is an expectation in an ED. Failure is measured in the ultimate terms of life and death, which in turn gives the ED physician the ultimate reward for success and challenge with failure.

This paper has aimed to discuss and seek to understand where the relationship exists between performance psychology and the performance excellence seen in the world of the ED. Indeed, are there opportunities for further progress and mental training to be done? The existing training system appears to be extremely successful at selecting, developing and nurturing talent, which warrants further close study and understanding. The margins for development may be considered small, but continuing to push the barriers of human potential is one of the hallmarks of high performing teams. This certainly seems to be true with each section discussed in this paper, with regards to understanding and developing a culture, the skills to manage thoughts and energy, as well as establishing plans and routines that can harness the power of knowledge and skills into consistent learned behavior. Whether or not these skills are developed explicitly, or implicitly, they are clearly relevant. If using the 'conscious competence'-learning learning model (Howell & Fleishman, 1982), we could say that developing optimal mental skills in order to further facilitate a physician's clinical skill can allow a better progression through the learning states. At a very simple level these state,

1) Unconscious incompetence – we don't know we don't know
2) Conscious incompetence – we know that we don't know
3) Conscious competence – we know that we know
4) Unconscious competence – we don't know we know

There's certainly a stepwise progression through building competence, but the level of consciousness as this is established is a result of the developmental journey through medical school, residency and beyond. The fact that more tools exist that can help on this journey is certainly worth further investigation.

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STUDYING HIGH PERFORMANCE TEAMS

UNDERSTANDING THE MENTAL DEMANDS OF THE EMERGENCY DEPARTMENT PHYSICIAN

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INTRODUCTION

One of the fascinating things about the field of positive psychology is that it reverses a medical model of looking to diagnose and treat dysfunction, and instead seeks to understand strengths and positive attributes leading to success (Seligman & Csikszentmihalyi, 2000). This kind of perspective opens up all kinds of possibilities if we begin to study high performance teams, in that we can gain insight into what makes them successful and what applications and lessons can be learned. This paper presents a case study of a high-performance team of Emergency Department (ED – also known as Emergency Room or ER) physicians and discusses some of the implications in relation to mental skills training, referred to as 'mental conditioning'.

UNDERSTANDING THE DEMANDS

To the layperson, it is clear that an ED physician must deal with issues of 'life and death' on a daily basis. Indeed, an Emergency typically indicates that someone is in crisis by very definition. To those in the field however, the actual demands are much more complicated than that. Patients in an ED can vary from those seeking primary care for chronic conditions, to patients suffering from mental health disorders, to critical care patients or even addicts seeking narcotics. The demands on the ED physician require high-level decision making skills, and the ability to process information very quickly and accurately. Specifically this revolves around establishing priorities, being decisive with limited information, and having a huge breadth of medical knowledge. At the same time, the physician knows that the consequences of their decisions and performance could result in the life, death and certainly affect the overall health of a patient. That the ED physician is also just a part of a much bigger part of a team is also an important factor. This team has a wide range of roles, from emergency medical service (EMS) paramedics, to nursing staff, lab technicians, administrators, and consultants from a wide range of specialties. In addition, the focus of this paper looks at an ED in a teaching hospital, which has an expanded role from that of a community hospital with an emergency department. The role of a teaching hospital is to provide clinical education and training of future and current doctors, nurses and other health care professionals and is often paired with a medical school. This adds another dynamic to the performance environment and different layers of training and experience from students, to interns, residents and attendings. Communication, coordination, and interaction among those with different levels of experience and development ultimately impact performance and success among this team.

DEVELOPMENT AND LEARNING FOR THE ED PHYSICIAN

The development of the ED physician's expertise is important to highlight because the demands of the job are so complex and the required job knowledge so vast. How does one 'learn' to make decisions under pressure that impact life and death? Indeed, developing expertise when incoming patients are so varied and unpredictable is very challenging. The following table aims to present a highly simplified representation of the typical training process from medical student to 'attending' or 'consultant' status.

Pre-Med	Premed requirements – courses and medical c aptitude test (MCAT) + life experiences
Yr 1 & 2	Medical school student – theory (how things work and how they can go wrong)
Yr 3 & 4	Medical school student – application (clinical skills developed through exposure to rotations throughout hospital)
Yr 5	Intern – fundamentally learning medical clinical skills with diverse rotations of hospital departments
Yr 6	Resident (post grad year 2) – continuing to learn clinical skills with rotations across hospital departments and disciplines
Yr 7	Resident (post grad year 3) – greater specialization in ER, learning to 'perform' (some programs do a post grad year 4)
Yr 8	Attending – mastery of medicine, full medical license, more team management & responsibility, with little supervision.

While this may be a typical track in the United States, many programs differ and so individual experiences may vary a great deal. In essence, medical training involves laying a foundation of scientific knowledge upon which the art of medicine is applied. This is noted by Lajoie (2009) as an example of a cognitive apprenticeship framework, which allows content knowledge to be applied through appropriate method and sequencing of instruction and sociology of learning for real-world task application and transfer. By looking at the physician as a 'performer,' the developmental journey to mastery is similar to that of many other complex professions, such as military special operations, aviators, and lawyers. Anders Eriksson, who has focused an academic career on performers' development of mastery (2009), indicates the volume of time training known as the '10,000' hour rule is critical, but that this high volume needs to be supported by high-quality, deliberate practice. The ED team described in this case study allows us to examine the implications for this developmental framework by looking at a team of physicians across developmental levels. By examining this from the perspective of performance psychology, we also begin to understand various factors at play that impact performance, including the importance of teamwork required to perform at a high level and also a system that supports inter-and intra-staff development.

CASE STUDY: *PRESENTING SOME KEY PERFORMANCE DOMAINS*

The purpose of this paper is to provide a snapshot of a working day of an ED physician, from the perspective of an applied sport psychology professional observing the performance demands and strategies utilized by the physician and the clinical team. This was conducted at a level-one trauma center emergency department in the South Eastern United States. A level-one center is the highest designation of center to provide comprehensive medical services as verified by the American College of Surgeons (ACS), which by definition includes the availability of trauma surgeons and highly sophisticated medical diagnostic equipment and care. The goal was not to provide a fully comprehensive and accurate depiction for all ED physicians, but to simply observe, examine and discuss areas of performance that arose during observation and insights shared by ED physicians. Comparisons are drawn to sport performance based on the mental conditioning model developed at the IMG Academy (Da Silva, Hesse, Andreoli, Mugford, Morgan, Le Vine, Lifrak, & Smith, 2011; Mugford, Morgan, Lifrak, Smith, Da Silva, Le Vine, Andreoli, Hesse & Moawad, 2012), with discussion drawn to implications for the field of performance psychology.

CRITICAL INCIDENT #1: TRAUMA ALERT WITH AN ADULT INJURED IN A MOTORCYCLE ACCIDENT RESULTING IN BILATERAL COMPOUND FRACTURES OF THE LEGS

A trauma is typically determined by pre-hospital personnel based on a set of criteria, who notify the appropriate hospital of the incoming patient(s), in order to help a 'Trauma Team' prepare for arrival. This team is typically composed of a number of different specialists including a pre-determined team leader, an anesthesiologist, surgeon(s), ED physician(s), a respiratory therapist, nursing staff, EMTs, a radiographer, and a scribe or technician to help record specifics of patient care. Depending on the status of the hospital, there may be a number of residents and interns also assisting physicians and staff during the process. The sickest patients are leveled or categorized as 'level 1' and receive a "Trauma Alert" response. Observing the trauma team assemble, it at first seemed chaotic. Positions and roles for each person in the room however are assigned, watched over by two attendings on duty. These attending's are the most senior physicians in the room, with one leading the ED team, the other leading the trauma surgery team. At first, priority was given to the patient's ABCs (airway, breathing, circulation) and the ED team's role. However the trauma surgery attending must determine the surgical needs and overall care of the patient. In some ways it was surprising that the attendings simply stood back and observed. However, the role of directing each team certainly seems to benefit from having the time to think through the situation and literally 'step back' from things in order to take in the big picture. It was like a head coach calling plays from the sideline or the conductor of an orchestra with skilled technicians conducting the work in front of them. While the team of doctors and nurses went through protocols, each person having purpose in their actions, they seemed to deal with the immediate concerns and had prepared the patient for surgery. As their roles were finished or transitioning, members of the team began to leave. It was then you could see the variety of roles that each person had. The combined work of the trauma team had also gathered an audience of additional hospital staff to observe and support if necessary, including the EMS and flight crew that brought the patient in,the chaplain, and technicians in the area. The patient was wheeled on the hospital gurney from the trauma bay to the nurses and physicians waiting in the operating room all within the space of about 15 minutes.

It is clear that both the execution of technical skill and overall team performance and coordination is critical to a successful outcome. The implications for performance psychology seem significant. Unlike other (non-medical) professions, the job tasks and ED environment can be extremely challenging and results literally involve life and death. As an outside observer, the experience of the critical incident itself was traumatic. As a non-medical professional, the first author of this paper felt a strong physical reaction to the trauma, with symptoms of a vasovagal response including lightheadedness and nausea, although this was short lived and did not result in loss of consciousness. The power of this physiological reaction to simply observing other practitioners in their work environment left an impression. After the critical event, the first author interviewed members of the Trauma Team for insights into their experience and challenges that they face in working in this environment.

COMMENT 1: A Second Year Resident (Female) shared, *"Having the [trauma] bay prepped and ready is really helpful. Today there were a lot of people involved and it can be challenging if we're trying to get additional equipment in and out. It's a part of the job I enjoy, to really focus and know that all the training kicks in, it almost becomes automatic. We have a lot of protocols in place, but communication and being really focused on what's going on is key."*

COMMENT 2: A Second Year Resident (Female) referred to her emotional reaction to dealing with the patient in critical incident one, *"He [the patient] grabbed at my sleeve and cried, 'help me'. It was heart breaking".*

COMMENT 3: A Third Year Resident (Female) added, *"It's sometimes easier to perform on a night shift when there are fewer people. It can get very stressful, especially if an attending is difficult to deal with. When we have multiple traumas at the same time it can get complicated and stretch staff out. Fortunately I think most docs who make it in ER are good at prioritizing and continually shift to what's most important right now".*

COMMENT 4: An Attending (Female) stated, *"The biggest challenges I face are constant interruptions. Dealing with who's sick and who's really sick. Constantly being presented information by different people [for example, residents, nurses]. When it's busy it can get really tough, managing the stress of information and constant switching".*

COMMENT 5: A Second Year Resident (Female) shared, *"I sometimes really struggle with confidence, particularly when talking to attendings. There are really no repercussions for rudeness in many specialties, and ER docs have a reputation sometimes as glorified triage nurses. We often have to call where they are subject matter experts in a specific area, while we clearly have to have a broader understanding of a lot more than one area, but they just don't see that."*

There was a high level of performance taking place, but in debriefing it was clear that there were a lot of thoughts and emotions involved. In this way, the similarities between elite sports started to appear more clearly. In sport we often see rehearsed routines and protocols that help switch attention and focus to existing priorities, but the thoughts and emotions experienced are still present. In many ways, these doctors can appear as 'superhuman', or from another perspective, 'detached' from the emotional aspect of patients dealing with a trauma or human suffering. Tyler (2012) has published in the area of psychological and neurobiological transfer of trauma to professionals working in this space, not limited to the ED professional, but also police officers, social workers, and others dealing with clients suffering from trauma. Limbic system activation can certainly impact decision making and stress management if untreated or neglected, which highlights the importance of understanding this area at a greater level. The long training and development process involved with these professionals mean that there is a certain level of acceptance and understanding that comes with the territory, and the role for developing cognitive-emotional strategies to manage this stress. Little if any formal training seems to be provided, which again highlights the opportunity for performance psychology to be more systematically employed or made available to these professionals.

Existing research seems to corroborate some of these observations with studies conducted in medical team situations where performance is critical to patient safety. Salas, Rosen & King (2007) conducted a study that identified the following features:

1. Team leadership matters
2. Team members must have clear roles and responsibilities
3. Shared understanding of task, team mates and objectives goes a long way
4. Take time to develop a discipline of pre-brief-performance-debrief
5. Team emotional affects matter
6. Clinical expertise is necessary, but insufficient for patient safety. Indeed cooperation, communication and coordination skills are key indicators that matter.
7. Teams must have clear and valued visions
8. Learning from mistakes, self-correction and adaptability are the hallmarks of high performances teams.

What is not clear is how many of these eight factors are systematically addressed, and indeed how much variation there is between different hospitals, or even different teams. Expectations are clearly high, but how much emphasis there is in improving performance is unclear. There appears to be some debate as to how well debriefing is utilized in the medical field, but without question more research into the potential performance enhancing impact of specific programs addressing these areas could have fascinating implications.

The ability for these clinicians to multitask is significant, particularly where decisions must be made under time pressure and with incomplete information. Research has shown that workplace interruptions are particularly prevalent and diverse in nature, resulting in many 'breaks in task' (Chisholm, Collison, Nelson & Cordell, 2000). Indeed, data indicates an average interruption within the ED may happen as often as nine minutes for attending physicians and 14 minutes for residents (Laxmisan, Hakimazada, Sayan, Green, Zhang & Patel, 2007). Laxmisan et al's research highlighted that gaps in information flow due to multitasking and shift changes had particular concerns for compromising patient safety. Improving electronic tools to help support multitasking and handoffs are key, but continuing to find ways to maximize human interaction, as well as mental and emotional capacity to manage performance in this complex environment is ideal.

While this is one critical incident, multiple psychological factors were raised.

- Group dynamics and systems approach of the 'Trauma Team';
- The emotional and neurobiological demands of working with victims of trauma;
- Learning through the utilization of feedback and supervision, with the related implications for communication and confidence; and
- The various demands on concentration from execution of technical skills to managing the various demands and interruptions of the job.

All may have significant roles in both the individual and collective performance of the ED physician and team. How much is acknowledged in the field is one issue, however, the potential opportunities to explicitly train and facilitate improvement is an exciting prospect.

CRITICAL INCIDENT #2: OBSERVING THE INTERACTIONS BETWEEN AN ED 3RD YEAR RESIDENT, A PATIENT, AND THE MEDICAL TEAM.

It is clear that the role of active listening and communication are skills that can dictate the level of success of an ED physician. In performance psychology, it is not just about performing the psychological skills required but also about setting the stage for optimal performance. For doctors, this can occur through the development of a collaborative relationship with the patient and the ability to communicate clearly in order to gather information, make clinical judgments and perform their medical skill. Note some of the following questions and interactions highlighted below:

Action: Knocking on door, or by curtain to gain permission to enter.

Question: *"How are you? What brings you here today?"*

Action: Shaking hands [having followed procedure to cleanse hands when going from room to room].

Question: *"Who have you brought along today with you?"* [Doctor introducing herself to visitors in the patient's room]

Question: *"If you don't mind, I'm going to type as we talk so I make sure I get down all of your details"*

Question: *"Is there anything else that you were concerned about, or that we can help with?"*

The doctor's goal of establishing a strong connection with the patient stood out from these interactions. The doctor was very careful to establish respect from the outset by knocking on the door and giving the patient a name, voice, and 'normal' social interactions, even to the point of shaking hands. While this is not an ideal sanitary exercise, the purpose is clearly to establish rapport with the patient and build a relationship, regardless of how brief that interaction may be. Hospitals can be intimidating and an impersonal place, so to see an emphasis on this was interesting. Indeed, the questions, *"what brings you here today?"* and *"is there anything else you were concerned about?"* are perhaps not that medically relevant to determine a diagnosis. Indeed, patients' descriptions and statements may often be inaccurate, but the doctor was really involving the patient and making them 'feel' treated, even though these may be less about medicine and more about caring. Patient satisfaction is an important consideration, especially to hospital administrators where there is an interesting dual role of the person as patient and customer. Research also indicates that the relationship and quality of interactions a patient has with a doctor can also be a predictor in lawsuits filed for alleged malpractice (Hickson, Claytno, Githens, & Sloan, 1992).

Having identified the importance of communication and teamwork in critical incident one, the importance of communication and relationship development with patients in critical incident two reinforces a pattern. Performance psychology literature has recognized the importance of communication in job performance (Colquitt, Scott and LePine, 2007; Roter, Hall and Aoki, 2002), but many questions remain. Can we be more proactive with training and developing communication as a skill to facilitate better and more productive connections and relationships? Whether the goal is to improve good medical practice, reduce the number of lawsuits, help improve job and patient satisfaction, or reduce stress, there seem to be a number of avenues that have business and financial implications.

It is important to remember that when talking about communication, this is not simply a matter of 'the message sent', but perhaps more important is, 'the message received'. Indeed, a patient's perception of their relationship with a physician is important and a challenge is that they may not get much time or interaction with the doctor. A common scenario witnessed in this case study, was for the doctor to have very brief interactions after long periods away from the patient . Unseen by the patient, the doctor spent a significant amount of time reading the patient history including to other records and notes, in addition to looking at lab results and discussing the case with other doctors. The importance of 'perception' was evident on a number of different levels. When considering comments from critical incident one, we start to see the different viewpoints that affect the third year resident physician we are shadowing. There is the perception of the patient (e.g. *'Am I getting the treatment I need? Do I trust this Doctor?')*, the perception of the supervising attending (e.g. *'Has this resident followed the appropriate procedures? Has she thought through the possible options? Do I trust her?)*, and perceptions of her colleagues and peers (e.g. '*Do I like working with her? Is she treating her patients well? Is she slow? Is she pulling her own weight?),* each of which may be in conflict with the others.

While these assumptions and thoughts are pure speculation, they are not unrealistic and highlight the long developmental journey of a physician. Typically these go from establishing a strong theoretical knowledge in medical school, to developing strong clinical skills while undergoing constant analysis and scrutiny. From the perspective of performance psychology, there is a period in this development process that highlights the growth of self-awareness and energy and thought management to successfully exercise good clinical judgment under pressurized circumstances. Closer examination into how this happens is worthy of study on its own.

In some teaching hospitals, residents are given formal written feedback on each shift, across a series of performance indicators by the attending on duty. The frequency and quality of feedback appears to have an important role in resident learning and development (Cydulka, Emerman & Jouriles, 1996). For example, some of the following areas are present on such evaluations and were outlined in a task force document by the American College of Emergency Physicians (Manthey, Coates, Ander, Ankel, Blumstein, Christopher, Courtney, Hamilton, Kaiyaia, Rodgers, Schneir, Thomas, 2006):

- CORE COMPETENCIES
  - Patient care
  - Medical knowledge
  - Practice-based learning
  - Interpersonal and communication skills
  - Professionalism
  - Systems-based approach

- DAILY SKILLS
  - Decision making abilities
  - Appropriate aggressiveness in patient care
  - Differential diagnostic skills
  - Completeness and accuracy of charting
  - Efficiency/speed of patient care
  - Orders labs and tests appropriately
  - Ability to handle multiple patients
  - Effectiveness of presentations
  - Procedural skills
  - Ability to run department
  - Resuscitation effectiveness

A formal evaluation like this may be scored on a 5-point likert scale, where a score of 1 may represent 'inadequate performance – consistently below expectations' to 5 'truly exceptional performance – always exceeds expectations for training level'. While this data may not provide a great deal of depth, it does provide a platform for broad and regular feedback from supervisors, with the additional opportunity for them to provide greater depth through comments. Formal evaluations only provide part of the picture indeed informal feedback comes at a much higher rate from from patients, family members and fellow medical team members. Understanding this, it is almost surprising to consider that they should manage this career transition while displaying a high level of confidence in every interaction, where demands are high and there is a significant and continual learning curve. While these areas of feedback provide some 'qualitative' information, there is also bottom line 'quantitative' information taken, which is ultimately the number of patients seen over the duration of a shift. Clearly not all cases are the same, and even though one patient may be seen and released relatively quickly, another may be extremely complicated and take considerably longer. This 'volume' approach is harder to evaluate, but it still seems like another source of feedback and work rate, even as a resident or less experienced practitioner.

Indeed, there is even a documented 'pressure' in this culture for doctors to work independently throughout their training (Kennedy, Regehr, Baker, & Lingard, 2009), although this is perhaps not unusual in certain professions like health care, aviation and even the military. For example, imagine airline passengers on an airplane hearing the first officer talk on the speaker system, "I hope we get to our destination today!". Perception is important, but even more so is the continual learning and growth of a physician in training, while constantly maintaining a standard of basic quality of care and professionalism. What is clear is that there is a tremendous amount to learn from the medical profession with regard to the development of high performing practitioners, as well as significant opportunities in the medical field to employ and utilize best practices, from the field of performance psychology.

OPPORTUNITIES & IMPLICATIONS FOR PERFORMANCE PSYCHOLOGY

There are many limitations of taking information from a single case study and drawing conclusions greater than that one single snapshot. However, it is felt that the greater good here is beginning a discussion on the mental skills and performance of domains like medicine to achieve a greater understanding of what works and why. What other performance domains can gain from these insights? What new levels of performance can be reached in medicine, by understanding human potential and the capacity for extraordinary mental performances? Can these high levels of performance be consistently reached time after time? This is an exciting frontier, especially when one considers the lack of documented research in this field applied to medical performance.

Medicine is a field that takes continuing medical education (CME's) seriously and there could be great opportunities to help further awareness and mental performance as part of this. Davis (2009) looked at models to maintain and improve medical knowledge and best practice in the context of CME's, particularly in relation to known models of adult learning. He concluded that complex practice-grounded models developed based on three types of learning were key:

1) Random and informal activities
2) Self-directed activities
3) Formal learning

By layering these together, they can integrate around a performance driven model where feedback on objective measures of competence and performance that can triangulate 'best practice'. Some of the keys for professionals working in this space is the collaboration with medical teams to identify the key performance indicators and a thorough understanding of 'effective' behaviors. As with all evidence-based practice, perhaps we let the data tell us what 'good' looks like.

At the simplest level, a strengths based approach simply asks the question, 'what are the skills that make a doctor successful?'. Indeed, when adding a systems model into consideration, there are many factors, such as the, interacting medical teams that have an incredibly strong impact on performance. Despite these complexities, it seems clear that successful doctors find ways to excel within the culture. Indeed, effective use of mental skills through plans and routines developed through experience may occur, but this seems very much up to the individual's initiative. While some areas have been fostered and institutionalized, like pre-performance routines, self-awareness through peer reviews and self-reflection, many others have not and appear to be idiosyncratic, at the discretion of the individual, medical school and residency program, through trial and error, and undoubtedly the quality of mentoring and supervision (Lajoie, 2009). Indeed, qualitative research has identified the role of supervision as one of the most important factors especially in physician development, especially when creating interventions for critical incidents in emergency medical services (Halpern, Gurevich, Schwartz & Brazeau, 2008). Recommendations following Halpern et al's study included education about stigma in the medical workplace and improving the ability for supervisors to reach out to young physicians and more mandatory debriefing after critical incident stress (e.g. incidents involving children).

Opportunities to learn and collaborate surely exist, as we continue to strive for better results. As technology continues to develop and take us to new frontiers of medicine, it's important not to forget that the most important machine is still the human brain. As such, seeing the physician as a performer perhaps changes the paradigm and opens up more opportunities and additional frontiers.

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