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RECOGNIZING AND MITIGATING FATIGUE CAUSED BY SLEEP DEPRIVATION: A COMMAND PERSPECTIVE

By Kevan Dugan

SWAT team commanders have enormous responsibilities. If they were asked to compile a list of concerns they face in the management of their teams, the topic of *fatigue* may not be found on very many. Yet, if you think about it, fatigue is directly related to items that would appear on the list, such as risk management, supervision, operational preparedness, decision-making, officer safety and liability. The purpose of the article is to give commanders a deeper understanding of fatigue caused by sleep deprivation, how broadly it can impact the team and to encourage general discussion on the topic.

Defining and measuring fatigue

What is fatigue? The Encarta World Dictionary lists the following as definitions:

1. Extreme tiredness or weariness resulting from physical or mental activity.
2. The temporary inability of somebody to respond to a situation as a result of over-exposure or excessive activity.
3. The temporary inability of an organ or body part such as a muscle or nerve cell to respond to a stimulus and function normally after continuous activity or stimulation.

But what exactly is “extreme” tiredness, and what is “normal” function of a muscle or nerve? Further, is there a direct relationship between mental fatigue and physical performance? The more one researches the subject, it becomes apparent that not only is fatigue due to sleep deprivation (FSD) hard to exactly define, it is even more difficult to measure. This is because no universal testing procedure to study fatigue exists.¹ Each study is inherently different in regard to the sample studied, and they are typically conducted in a lab or simulator setting or are a retrospective analysis of real incidents.

One way fatigue is measured is through *reaction time*. Clinical tests usually proceed in this manner: A group of well-rested individuals will be required to perform a task in response to a stimulus. For example, when the subject hears a sound or sees a light, he presses a button. The interval between stimulus and response is measured in time. The individuals will then be kept awake and testing will continue at intervals. At the end of the testing period, normally a minimum of sixteen hours, a graph of the results is analyzed. It should come as no surprise that there is a strong relationship between FSD and reaction time in the negative direction.²

Another type of clinical test determines what effect sleep deprivation has on performing a more complex task, not a simple one like hitting a button. The objective here is not concerned with speed as much as it is with accuracy and fine motor skills. These tests are often conducted for the medical industry. They are directly related to skills new resident doctors, on call for as long

as 24 hours without sleep, often engage in, such as inserting a catheter.³

Would you, as a patient, prefer to have a well-rested doctor performing this procedure, or one that has been without sleep for 24 hours? Perhaps now I have your attention. Does this example make it easier to understand the breadth of the topic? It is no longer just as simple as a slower reaction time. In this context we can identify other issues such as patient safety, decision-making and personal and professional liability due to procedural errors.

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Many industries are under governmental mandates to ensure employees are not performing their duties beyond a certain number of hours, because it diminishes abilities. Train conductors, commercial drivers, nuclear facility operators, air traffic controllers and pilots are among those employees affected by these regulations. Some of you reading this article may have cited a commercial driver for a logbook violation in years past, or have shaken your head in wonder when a news article relates that the investigation of an airplane crash reveals the pilot had flown outside of industry regulations for rest. However, we rarely give much thought to one of our SWAT officers working without sleep for hours far in excess of what these individuals did. Yet, isn't this officer just as

likely to become involved in a decision to use lethal force as much as a well-rested officer? If you think it is unlikely that one of your officers will find themselves in this situation, let me provide a plausible example.

Officer Jones is a recent addition to your team. He is in his mid-thirties and he and his wife have two children, one of whom is a newborn. Jones' wife works during the day and to help offset childcare costs, he works a steady afternoon shift (1500-2300 hours). On any given day, Jones is usually up at 0630 to ensure the older child is off to school on time, while his wife gets ready for work. He rarely sleeps during the day, normally taking care of homeowner tasks and watching the newborn. He passes his wife the childcare responsibilities as she gets home, and he quickly leaves for work. After completing his shift, he returns home at 2330 hours. He has now been up for 17½ hours without sleep. He is still amped from his shift and does not go to bed until midnight.

As he settles into bed, his pager goes off for a barricaded gunman call out. By the time he arrives at the scene and deploys it is 0130 hours. The gunman refuses to surrender despite repeated attempts by the CNT. Chemical agents are inserted from 0300-0330 hours, but fail to dislodge the suspect. The front door is breached by explosives at 0400 hours and a robot is sent in to search. The subject is not found by the robot and the team must now do a physical clearing of the residence. An entry plan is rehearsed and the team enters covertly to search for him at 0500 hours. Jones is part of the entry element and at this point has been up for 22½ hours.

If you would not have assigned Officer Jones to the entry due to lack of sleep, good for you. That means you have a policy and controls in place, and there is good communication between your team leaders and team members as they come into the perimeter. If you would not have known of Jones' situation, or would have made no reassignments, *please keep reading!*

How fatigue affects the individual

Mammals are either nocturnal or diurnal, meaning that their circadian rhythm suits them for either nighttime activities or daytime activities. As mammals, humans are diurnal and our synchronization is geared to being awake during the day and to sleep at night. Our body's master clock is controlled by the suprachiasmatic nucleus (SCN) within the hypothalamus, which is located just above the optic nerve. The SCN controls production of melatonin, which is the hormone that makes us sleepy. The SCN relays information (amount of incoming light) from the eyes to the brain. When it detects less light, such as at night, it tells the brain to make more melatonin, so we become drowsy and sleep.

This system worked unmolested up until the invention of the electric light and the onset of the industrial revolution. These additions to our world affected the amount of sleep that we received by extending our workdays into additional shifts or allowing us to enjoy extended leisure activities beyond sunset. Now, in modern society, our sleep is decreased by secondary employment, television, working at home via computer, nightlife activities and more.

Despite the fact that artificial light tries to fool the SCN, our bodies are still subject to our internal clock. This clock automatically wakes us every day, often before our alarm does. Even when light cues are absent from the SCN, melatonin is still being released in a cyclical manner because the pineal gland is still able to measure day

length and adjust secretion of melatonin. And since melatonin is still being released, we will get drowsy, regardless of our attempts to stay awake. Even working the graveyard shift for years cannot change the way that nature has wired us. This accounts for why we still experience drowsiness due to shift-work. As an organism, we can only adjust our circadian rhythms so much. To add insult to injury, our ability to adjust deteriorates with age.

Besides the short-term effects of FSD, medical evidence suggests that sleeping less than five hours a day makes us more prone to heart disease, weight control issues and other illnesses that can shorten our lives after retirement.

Impact on operations: Risk and liability

Since we know that we are physically unable to greatly change or avoid our natural rhythms, we need to recognize what occurs when these rhythms are disrupted. As previously stated, there is a strong relationship between FSD and reaction time in the negative direction. Speed and accuracy are decreased, with the evidence being much more conclusive with respect to speed than accuracy.⁴ FSD leads to psychomotor impairment. According to Sweeney, sleep deprived officers "are less alert, more apt to experience heightened 'startle' reflexes, and more likely to overlook danger signs during high-risk encounters."⁵ The standard academic belief is that 17 hours without sleep equates to an impairment of a .05 BAC, while 24 hours without sleep equates to the impairment

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associated with a .10 BAC⁶. So what are the implications of this in a team environment?

If we return to our example of Officer Jones, his current state of FSD will put him even further behind the reactionary curve when presented with a stimulus, such as the barricaded man suddenly emerging and pointing a weapon at him. And, if accuracy is also affected, perhaps Jones' first round is not on target, giving the suspect more time to engage in deadly activity that threatens officer safety. The worst-case scenario would be Officer Jones, startled by the sudden appearance of an unarmed subject, experiences a heightened startle reflex and inappropriately uses lethal force.

In his study for the military, Gerald Kruegar also found that "CONOPS (continuous operation) combatants, especially 'night fighters' who work during darkness and rest during the day, get only brief, scattered, fragmented sleep and often accumulate significant sleep debt. Sustained workload combines with fatigue... to degrade performance, productivity, safety, and mission effectiveness. Sleep loss interacts with workload, resulting in reduced reaction time, decreased vigilance, perceptual and cognitive distortions, and changes in affect, all of which vary according to circadian rhythm time-of-day effects."⁷

An unpublished DOJ article identified two principal physiological sources that bring

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Winter 2012 NTOA Training Calendar

Course	Course Start	Course End	Registration Deadline	Member Discount Cost
Advanced SWAT Southampton, NY	06/25/12	06/29/12	05/25/12	\$695
Carbine Instructor Certification Hampton, VA Ashtabula, OH	04/23/12 05/21/12	04/27/12 05/25/12	03/23/12 04/20/12	\$680 \$570
High-Risk Warrant Service Annandale, MN	05/21/12	05/23/12	04/20/12	\$460
Less Lethal / FSDD / Chemical Agent Instructor Certification Ashtabula, OH Broken Arrow, OK LaGrange, GA	04/23/12 05/07/12 06/11/12	04/27/12 05/11/12 06/15/12	02/24/12 03/07/12 04/11/12	\$700 \$710 \$710
MACTAC Ashtabula, OH	08/13/12	08/17/12	07/13/12	\$1095
Patrol Counterambush Ashtabula, OH	07/16/12	07/18/12	06/15/12	\$470
Police Response to Active Shooter Instructor Certification LaGrange, GA Spotswood, NJ Ashtabula, OH	04/02/12 04/10/12 06/20/12	04/04/12 04/12/12 06/22/12	03/02/12 03/09/12 05/18/12	\$470 \$500 \$410
SWAT Command Decision-Making and Leadership Port St. Lucie, FL	04/16/12	04/20/12	03/16/12	\$660
SWAT Team Leader Development Foley, AL Birmingham, AL Radford, VA LaGrange, GA	03/19/12 04/02/12 06/11/12 07/23/12	03/23/12 04/06/12 06/15/12 07/27/12	02/17/12 03/02/12 05/11/12 06/22/12	\$660 \$655 \$660 \$660
Tracking & Wooded Terrain Operations Ashtabula, OH	08/20/12	08/22/12	07/20/12	\$740
Training Management and Risk Mitigation for SWAT Ashtabula, OH	03/19/12	03/20/12	02/17/12	\$245
NTOA Conferences				
12th Annual International Breachers Symposium Dallas, TX	05/07/12	05/10/12	04/15/12	\$250
29th Annual Tactical Operations Conference Seattle, WA	09/09/12	09/14/12	07/31/12	\$500
12th Annual Crisis Negotiations Conference Mesa, AZ	10/23/12	10/26/12	10/01/12	\$300

Non-members must add \$55 to cost of class listed above. If you are not an NTOA member you may join for \$40 per year and take advantage of the Member Discount Cost. To register for a class, visit www.ntoa.org or call 800.279.9127, ext. 2.

about fatigue: cumulative sleep loss and disruption of circadian rhythms. It stated that disruption of the circadian rhythm decreases alertness, impairs performance and worsens mood, and that FSD interferes in decision-making in the formation of sound judgment, encourages unnecessarily constrained choices and induced poor responses via increased irritability. This document also associated FSD with a likely increase in use-of-force misconduct.⁸

Please do not misinterpret some of the previous statements as some plaintiff's attorney surely will. The analogy of impairment to certain BAC measurements is in regard to reaction times, and not to moral behavior issues associated with intoxication (and ensure that your testimony clears this up if you find yourself in a defensive posture). Further, the perceptual and cognitive distortions and interference with decision-making and formation of sound judgment does not mean that FSD will cause our officers to make immoral decisions. It means that decision-making is slower and that an officer may be less likely to engage in divergent thinking and consider other options when discretionary time is available.

Many of you may have personally experienced increased irritability and worsening of mood due to FSD. Think about whether, when you were very tired, you were ever angry with a friend or family member when you should not have been or said something you later wished you could take back. Now replace your friend with a suspect who is not going with the program and add FSD cognitive distortions and interference with sound judgment. Can you now see the increased chance of a use-of-force misconduct event? It is not that it was an act of intentional misconduct, but a manifestation of concurrent physiological effects of FSD. Negotiators will tell us that when emotions are up, rational thought is down. And as Jensen said, "Without enough sleep, we all become tall two-year-olds."⁹

SWAT incidents can present very unique and complex problems. Team commanders,

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team leaders and team members must make decisions to effectively resolve these problems while ensuring that the solutions are within policy, legally proper and ethically acceptable. These decisions (executive functions) are carried out in the prefrontal cortex and are affected by sleep loss and fragmented sleep. Executive function is defined as "the ability to plan and coordinate a willful action in the face of alternatives, to monitor and update action as necessary and suppress distracting material by focusing attention on the task at hand."¹⁰ To accomplish this, we need to engage in divergent thinking, which relies heavily on executive function. Divergent thinking enables us to see the big picture through intelligence analysis, seeking and receiving input, logical discussion of options, formulation of plans in support of objectives and contingency planning. However, a member suffering from FSD may not seek input or logically discuss options before acting or forming a plan. His or her thinking will be *constrained*, not divergent.

While the personal and departmental risk and liabilities associated with a SWAT call out itself should now be evident, our worries as a commander do not stop once the incident is resolved. Risks to our future operations begin immediately after the SWAT officers are dismissed from the after-action critique of the current incident. Officer Jones' saga continues.

After a successful covert search for the barricaded suspect, gearing down, and attendance of the incident critique, Jones begins his drive home at 0600. If we assume merely a half-hour ride home without stopping to eat (or any other reason), Jones has been up for 24 hours. More often than not, he will arrive home safely. However, NTSB statistics tell us that most accidents occur between 0200 and 0600, even though there are fewer cars on the road during this period.¹¹ Therefore, what if, because of his fatigued state, Jones is involved in an accident in which he is injured and the vehicle damaged? For the sake of this article, let's stipulate to the emotions, concerns and assistance provided to an injured team member, and look deeper into ancillary issues. How does this affect the team's operational ability?

Well, his commander will be short one person on the next call out or for the next several call outs, depending on the severity of the injury. Jones' training is disrupted and his skills begin to deteriorate. He may also miss new training that will have to be remediated later. And how will the department budget be affected by either repair or replacement of a vehicle costing thousands of dollars? Beyond this, since Jones is not assigned full-time to the team, his regular co-workers are also affected. His shift will either be short a person, or if additional overtime funding is available, it will need to be covered by someone else.

Further, depending on where Officer Jones lives, he may also have broken the law. In 2003, in New Jersey, legislators passed a law in honor of Maggie McDonnell, killed in 1997 in a head-on collision by a driver who admitted going thirty hours without sleep as well as using drugs. The New Jersey law states that a sleep-deprived driver qualifies as a reckless driver who can be convicted of vehicular homicide. The law defines "fatigued" as having been without sleep for a period in excess of 24 consecutive hours. As commanders, we cannot allow our officers to endanger themselves, others, or operate outside of the law.

In an article published in the August 2007 edition of the *FBI Law Enforcement Bulletin*, entitled “Police Fatigue: An Accident Waiting to Happen,” Dennis Lindsey gives the account of a detective on a narcotics task force who worked 35 straight hours on a case and then drove home afterwards. Part of the reason he was sleepless for such a long period was because a “judge in the case advised the prosecuting attorney that if the detective was not in court that day by 2 p.m., the case would be dismissed without prejudice.” After court, as the detective approached the midway point on his route home, his vehicle, according to witnesses, swerved left, traveled through the median strip, crossed the oncoming traffic lanes, flipped several times, and ultimately came to rest on the opposite side of the interstate. The detective was severely injured and out of work for over a year.¹² Although no one was killed in this incident, it is offered as a real life example of why the topic should be discussed within the team, and why controls need to be in place to ensure the safety of our members.

Training to recognize fatigue

First and foremost, I encourage you to discuss this topic as a team using references at the end of this article or others that you find through independent research as a stimulus for the discussion. It is especially useful to talk about personal examples of events that occurred due to FSD since most team members have probably experienced its effects. Good communication within the team is a *must* to recognize fatigue and mitigate its effects. Similar to intoxication, once we are fatigued, we become very poor judges of just how exhausted we are. Therefore, an independent assessment by a supervisor is critical. Here is a simple checklist that can be used as a starting point:

- Check incoming members as they arrive at the assembly point or on the perimeter.
- Be specific in your questions as to how long they have been without sleep.

- Observe their behavior:
 - excessive yawning
 - head nodding
 - pronounced or excessive blinking
- Individually, question if are they experiencing
 - a drowsy relaxed feeling
 - blurred vision
 - narrowing of peripheral vision
 - difficulty keeping their eyes open

Establishing a policy

Many departments already have a policy on consecutive working hours since secondary employment is common nowadays. I would suggest using that policy as a starting point, and discourage the development of another, since two different policies would be like blood in the water to circling attorneys. However, you need to analyze your department policy carefully. First, as the policy currently exists, have you ever unknowingly violated it due to a long-term call out? If not, is the policy so restrictive that a violation will be inevitable given a call out of sufficient duration?

Also consider whether an officer who is not in violation upon completion of the call out, will be in violation if he immediately reports for and works his regularly scheduled shift. In this case, you may be just kicking the can down the road. Now it is not just a team issue, it is a department issue. You may also want to ensure that a mechanism is in place to notify the follow-on shift supervisor, so he or she can make a determination of the officer’s duty status. This may become a bit cumbersome if your team is multi-jurisdictional, because the mechanism needs to effectively bridge several departments. Developing a rotational rest plan to be utilized if necessary on call outs and planning for complete team relief by an adjoining jurisdiction’s team are two more items to consider.

If some or all of these scenarios are possible, you would be well advised to discuss these matters with your policy-makers and department legal counsel so that the

members are protected from violating department policy and to deny a plaintiff’s attorney easy access to a municipality’s deep pockets.

If your department has no policy, now may be a good time to develop one. Obtaining examples from other departments is very beneficial and oftentimes requires just minor adjustments to suit your departmental needs. A generic policy might include some of the language that follows:

Definitions:

- *Fatigue due to sleep deprivation:* as defined in this policy, a temporary condition of diminished performance due to an inadequate amount of sleep
- *Rest period:* as defined in this policy, a continuous period of time from X to X hours when the officer is not on-duty

General policy:

• Upon notification of a call out, and after completion, the (municipality’s) SWAT members will evaluate their ability to properly perform their required duties. Conditions that may impact performance are: use of intoxicants, fatigue due to sleep deprivation or any other condition that may reasonably be expected to diminish their performance.

• If the member is incapable of immediate response due to his condition, he shall promptly notify the team leader or commander. All members responding to the incident shall promptly report any condition that would affect their performance to the command post or their team leader. The supervisor will make an assessment of the member’s ability to participate, or to their degree of participation, based upon the information received and observation of the individual. No member shall report for duty or be permitted to perform any duty assignment while under the influence of drugs or alcohol which impairs their ability to perform.

• Because of officer safety concerns, no member will work an extra-duty, secondary

employment or overtime in excess of XX hours in one time period without a rest period between assignments.

Exceptions:

- It is impossible to predict all of the scenarios that may arise from police emergencies, such as SWAT call outs. Therefore, a member may need to be on duty more than XX hours due to the unique dynamics of the emergency. Should these situations occur, the commander and/or team leaders shall attempt to provide brief resting periods on a rotational basis, to offset fatigue due to sleep deprivation. However, officers should never work beyond their physical limitations when it will reasonably be expected to negatively impact officer or citizen safety.

Final thoughts

Departments entrust team commanders with a great deal of responsibility, some of which may not be readily foreseeable, like FSD. Commanders need to ensure that team leaders continue to assess members as the incident moves forward and make appropriate assignments based upon that knowledge.

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”

Perhaps even more important, they need to continue to assess their team members after the incident is over and perhaps into their next shift. The fastest way to spoil a well-executed mission is to have a member injured unnecessarily while returning home. If our departments entrust us to manage and mitigate risks, then we should continue to do so until everyone arrives safely home. “

Endnotes

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About the author

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- .50 cal for SWAT
- .223 Federal hollow points vs. .223 TAP rounds

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