Understanding the Dynamics of Stress & Decision-Making to Enhance Human Performance

BY NICHOLAS PAPA

The impact of stress on firefighter performance is one of the single-most overlooked and marginalized factors in the fire service (Photo 1). Whenever reporting for duty, we leave the routine world, and enter a sustained period of liminality. Like a coiled spring, we undergo the chronic stress of vigilance. Throughout the 24-hour shift, we remain in a state of readiness to respond, at a moment's notice, and protect our communities from the clutches of fire. When the bell suddenly hits, releasing that metaphorical spring, we are thrusted into the fray of the emergent world, placing us under acute stress. "Tactical athlete" has become a buzz word to describe firefighters; creating a hybrid analogy comparing firefighting to both combat and sports. Despite the similarities with those two arenas, firefighting is in a class all of its own. For firefighters, there is no off-season or -cycle. There is no training camp or work-up. There is no advance notice providing the details of the game or the mission, or the opportunity to prepare for the event. The roster is highly variable, and we may not have any prior experience working with our teammates. And to solidify the disparity, our senses are impaired; particularly our vision.[1]

Photo 1: Operating in an acute stress environment requires a practical understanding of how the body and mind are impacted, as well as the physical and mental skillsets to regulate the stress response (courtesy of Pat Dooley).

The acute stress response is a primal survival mechanism, designed to protect us in moments of peril. It is a powerful driver that can enable us to perform incredible feats. This force, however, must be harnessed, as an unbridled response can counterproductively jeopardize our performance. This requires an understanding of how it works, as well as the decision-making process, and the measures we can take to regulate and refine them, respectively. As Navy Sea, Air, and Land (SEAL) Teams Commander Jocko Willink (ret.) stated, "Don't think of stress as something you need to fight against. Think of it as something you need to work with."[2]

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[1] Jason Brezler, Jimmy Lopez, Jake Dutton, lectures, *FDNY Mental Performance Initiative 13*, November 14, 2023.
[2] Jocko Willink, *Jocko Underground Podcast*, Episode 70 (August 4, 2023).

Threat Detection and Response

When the limbic system (responsible for regulating our emotional and behavioral responses) perceives a potential threat, the sympathetic division of the autonomic nervous system (ANS) is activated. The ANS, which regulates the involuntary physiological processes of the body, operates like a dial to modulate between the sympathetic division, and its counterpart, the parasympathetic division. The sympathetic is a catabolic (pro-inflammatory) mechanism—releasing energy through the breakdown of complex molecules into simpler ones—for the purpose of priming the body for immediate action (also known as fight, flight, or freeze). The parasympathetic, conversely, is an anabolic (anti-inflammatory) mechanism—consuming energy through the production of complex molecules from simpler ones—for the purpose of restoring the body (also known as rest and digest/feed and breed).[3] A simple analogy for this dynamic is the gas and brake pedals of a car: the sympathetic being the gas and parasympathetic being the brake for accelerating and decelerating the body's level of arousal, respectively.[4]

Every second, our senses are inundated with over 11 million pieces of information. With sight being our primary sensory input, the vast majority is taken in through the eyes (followed by the ears). The thalamus (the relaying part of the brain) parses through that barrage (except smell) to filter out the unrelated or nonessential. The pertinent sensory information is then transmitted to amygdala (the threat detection part of the brain) and the neocortex (the thinking and predicting part of the brain). When the amygdala detects a present or anticipated threat, it generates a signal to the hypothalamus (the regulating part of the brain) that triggers a sympathetic response. A series of hormones and neurotransmitters—primarily cortisol, epinephrine, and norepinephrine—is then released along the hypothalamic-pituitary-adrenal (HPA) axis (the driver of the endocrine system). The hypothalamus also provides a bidirectional link between the endocrine system and the ANS. This initiates the following cascade of changes in the body: blood vessels are constricted to elevate blood pressure (vasoconstriction), blood flow to the organs and muscles required for survival is prioritized, heart rate increased and the amount of glucose in the bloodstream are increased, and non-essential functions are temporarily slowed or ceased.

The pathway from the thalamus to the amygdala is comparatively shorter than it is to the neocortex, which allows the signal to arrive there in roughly half the time (thousandths of a second).[5] Because of this accelerated rate, the amygdala can react to the sensory stimulus before the neocortex can determine its validity, if it comparatively recognizes a threat pattern within a past event stored in the hippocampus (responsible for long-term memory and spatial navigation). The circuit between the thalamus and the amygdala, however, only transmits a fraction of the signal, while the bulk is directed to the neocortex. These factors make the amygdala susceptible to a false match, which can initially generate an inaccurate response. Acting as a check and balance to those impulsive reactions, the neocortex, verifies and regulates the signals of the amygdala's activation to ensure the response is appropriate for the issue being confronted; specifically, the prefrontal cortex (responsible for decision-making, problem-solving, and

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[3] Joel Jamieson, *Understanding Heart Rate Variability: Improving your Health & Performance*, The Dr. Gabrielle Lyon Show, May 27, 2025.

[4] Rob Wilson, *Look. Is Your "Check Engine" Light On,* Jocko Podcast: Episode 495, June 18, 2025.

[5] Daniel Goleman, *Emotional Intelligence: Why It Can Matter More Than IQ* (Bantam, 2005); American Psychological Association, *Stress Effects on the Body* (October 21, 2024); Harvard Health Review, *Understanding the Stress Response* (April 3, 2024); Daniel Goleman, *Emotional Intelligence: Why It Can Matter More Than IQ* (Bantam, 2005); American Psychological Association, *Stress Effects on the Body* (October 21, 2024); Harvard Health Review, *Understanding the Stress Response* (April 3, 2024); Steven Kotler, *The Rise of Superman: Decoding the Science of Ultimate Human Performance (Amazon, 2021)*.

working memory) and the inferior temporal cortex (responsible for visual object recognition and processing), each of which also work in concert with the striatum (a decision-making part of the brain that controls motor and reward function) and the hippocampus, respectively.[6] The cingulate cortex functions as a bridge between the limbic system and the neocortex and mediates emotion and cognition to regulate the autonomic (motor) response.[7]

The aversive sensory and emotional information encoded by the amygdala is also transmitted to the the striatum. The striatum initiates the specific goal-oriented action and movements, based on the learned behaviors—habits and skills—and the anticipated outcomes associated with the cues identified. That process of pattern recognition increases the production of the hormone and neurotransmitter dopamine (responsible for motivation, pleasure, and reward-based learning) when the result is correctly predicted. The increased dopamine reinforces that connection to make it stronger and faster—promoting the development of myelin (the insulator for the conduit that transmits those signals). Dopamine also enhances attention and creativity, as well as facilitates the recognition of additional patterns.

Containing over 500 million neurons (greater than the quantity within the spinal cord), the gut possesses its own complex nervous system that plays a role in this process as well. Known as the enteric nervous systems (ENS), it is the "most complex neural network outside of the brain."[8] While it operates as a component of the ANS, the ENS also has a limited ability to operate independently; earning it the nickname ‘the second brain.’ The ENS serves as the link between the neurons in the gut and those within the brain, forming the gut-brain axis. The connection allows for bidirectional communication, transmitted along the vagus nerve, which signals activation of either the sympathetic or parasympathetic nervous system. The trillions of bacteria microbes found within the gut (the microbiome) produce neurotransmitters that are involved in sending those signals to the brain. The physiological sensations experienced (commonly described as gut feelings) have the power to influence mood, cognition, and behavior. These experiences are often inexplicable (at least in the moment), manifested at the subconscious level, and can influence our decision-making (also known as ‘gut intuition’).[9]

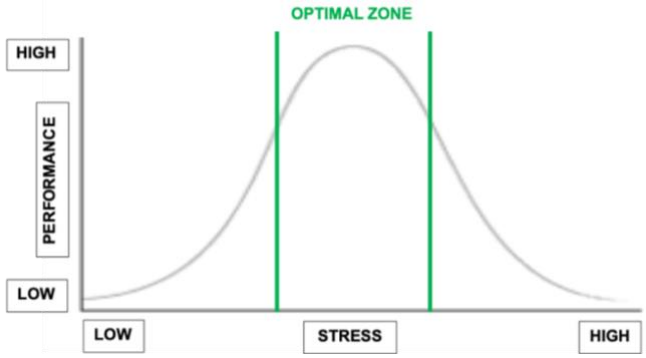

Figure 1: The stress-performance bell curve representing the Yerkes-Dodson Law.

Stress and Performance

The degree of stress precipitated from a threat, and the psychological and physiological response it generates, has a direct impact on performance. Stress is a necessary evil, as it is required for us

[6] Rich Diviney, *The Attributes: 25 Hidden Drivers of Optimal Performance* (Random House: January 26, 2021).
[7] Olivia Guy-Evans, *Cingulate Cortex*, SimplyPsychology.org (August 18, 2025).
[8] The Cleveland Clinic, *The Gut-Brain Connection* (September, 20, 2023).
[9] Diego Bohórquez, *Huberman Lab Podcast: The Science of Your Gut Sense & the Gut-Brain Axis* (May 27, 2024).

to perform optimally; stimulating our body and mind for action (known as eustress). Too much stress (known as distress) or even too little stress, however, can negatively impact performance. Low stress can fail to capture our attention, producing a lack of focus and urgency, leading to carelessness and complacency. High stress can trigger anxiety, frustration, exhaustion, panic, and a breakdown of our faculties. The stress–performance bell curve—the Yerkes-Dodson Law—visually demonstrates that high performance occurs at an intermediate stress level (Figure 1). Under this moderate stress, we are energized and dialed in. At the apex of performance, is a state known as flow; where excellence intersects with challenge, and the moment is fully embraced. The immersive event has a clear goal, involves risk, tests our abilities, provides immediate feedback, and is intrinsically rewarding. This releases pain-relieving and pleasure-inducing endorphins and the neurotransmitter anandamide (enhancing creativity and suppressing fear). Sections of the prefrontal cortex are deactivated, altering our perception of self and time (a condition known as transient hypofrontality), and our brain waves shift to a pattern that enables creativity, confidence, and composure (low alpha/high theta rhythm). With our implicit system amplified, "profound mental clarity and emotional detachment" are experienced, providing the sense of agency and concentration for actions to come naturally and seamlessly.[10]

Exceeding the positive threshold of stress—an aggregate of both physiological and psychological stress—is a state also known as going off the backside of the curve or being right of center (referring to the aforementioned bell curve). Once our level of arousal reaches the point of diminishing return, we will start to become impaired. The magnitude of distress experienced, comparatively determines the extent of the negative impact imposed on our cognitive and physical abilities. Despite being largely stationary on the exterior, two of the most stressful positions on the fireground are the motor pump operator (MPO) of the first arriving engine company and the incident commander (IC). These individuals possess a tremendous amount of responsibility and are being inundated with psychological stress, particularly enroute to the scene and in the first few minutes of an incident. They also have the disadvantage of not having a physical outlet to offload that stress, and working independently.[11]

Hyperarousal can interfere with the activation of the prefrontal cortex, due to sustained hormone production, particularly the glucocorticoid cortisol; inhibiting rational thinking and working memory (also known as amygdala hijack). When this occurs, we become the most primitive version of ourselves—reacting on the impulse of survival. The physiological effects of (hyper)arousal that impact performance are as follows:[12]

- Tunnel vision (narrowing of the visual aperture)
- Auditory exclusion (dampening of sounds)
- Perceptual distortion (time and space)
- Motor skills deterioration (fine → complex → gross)
- Speech impairment

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[10] Kotler, *The Rise of Superman*.

[11] Grossman, *On Combat*; Robert Brown, "Auditory Exclusion and How the Sympathetic Response Affects Our Operational Performance on the Fireground," *WNYF*, 2016; Robert Brown, "Smart Venting Using the SA Cycle," *WNYF*, 2014; Jonathan Fader, *Life as Sport: What Top Athletes Can Teach You About How to Win* (Da Capo Press, 2016); Eric Nurnberg and Michael Asken, *Fire Psyche: Mental Toughness and the Valor Mindset for the Fireground* (Mind Sighting, 2014); Goleman, *Emotional Intelligence*.

[12] Goleman, *Emotional Intelligence*; Psychological Association, *Stress Effects on the Body;* Harvard Health Review, *Understanding the Stress Response;* Jason Brezler, Jimmy Lopez, Jonathan Fader, and Jeff Facinelli, lectures, *FDNY Mental Performance Initiative 13*, November 14, 2023.

The principal stressors that trigger arousal are perceived danger, uncertainty, friction, and complexity, which cumulatively result in the subjective feeling of pressure being experienced. The higher the stakes and the more volatile, ambiguous, novel, or challenging the situation is, the greater the likelihood and severity of hyperarousal.

There are measures that can be taken to regulate arousal prior to, during, and after an operation (also known as "Prime → Reset → Recover"):[13]

- Deliberate Practice (skill acquisition and stress exposure training)
- Tactical Breathing (Box, 4-7-8, and Coherent Breathing, and Cyclic Sighing)
- Routines (response rituals and mantras)
- Resets (pause → calibrate → execute)
- Self-Talk & Mindset (positive and competitive)
- Reflection & Refinement (debriefs and corrective action)
- Recovery & Wellness (nutrition/hydration, fitness, and sleep)
- Mental Rehearsal (performance imagery and Tactical Decision-Making Games)

The practices used during an operation, aim to actively downregulate the level of arousal, when experiencing a heightened sympathetic response. The common physiological cues of (hyper)arousal are as follows:

- Racing/bounding heart
- Rapid breathing
- Muscle tension (e.g., clenched fists or jaw)
- Nostril flaring
- Dry mouth
- Sweating
- Internally hot
- Jittery (e.g., the IC pacing in the street or the MPO's foot chattering on the gas pedal)

Because they are unique to each person, we must identify how our bodies specifically responds to stress, particularly the early signs of arousal. Possessing this interoception, allows us to more proactively address these caution flags by intervening with downregulating countermeasures to minimize the negative impact of hyperarousal. Preparation and readiness are among the best ways to proactively combat distress and achieve high performance; addressing the mental, physical, and tactical domains (known as the Performance Triad).[14]

Deliberate Practice

Training must focus on the fundamental skills and be progressive to develop what the US Marine Corps calls a "brilliance in the basics." Excellence is forged in passionate discipline and the relentless pursuit of mastery. This requires vulnerability and humility to seek continuous improvement and push the limits of our capabilities. Training must be practical, and reinforce the established operational system and processes. The intent of the skill and its relationship to the fireground at large, must also be provided to ensure comprehension and proper application.

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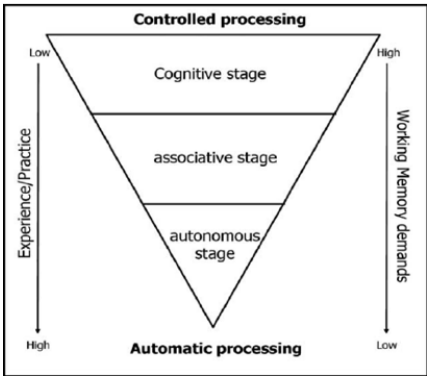
[13] Harry Moffitt, *The Fourth Pillar: Modern Stoicism and the Philosophy of High Performance* (Pan Macmillan Australia, 2025); Brezler, Lopez, Fader, and Facinelli, *FDNY Mental Performance Initiative 13*.

[14] Brezler, Lopez, Fader, and Facinelli, *FDNY Mental Performance Initiative 13*; Dan Dworkis, *The Emergency Mind Podcast: Learning to Perform Under Pressure with Adam Szulewski and Julie Law* (October 29, 2024).

According to the Fitts and Posner Model of motor learning, skill acquisition is comprised of three distinct stages: 1) Cognitive; 2) Associative; and 3) Autonomous (Figure 2). In the Cognitive Stage, the theory of a skill, the system of movement patterns (identifying a defined hierarchy and how the parts are interrelated), and their intent are explained. In the Associative Stage, the foundational movements are deconstructed and drilled in isolation. The drills are then expanded in scope to chain the movements together in a functional sequence. In the Autonomous Stage, full-scale ("scrimmage") evolutions are conducted to simulate performing the skill at an actual event. The allotment for each stage should be as follows: 20% in the Cognitive Stage; 70% in the Associative Stage; and 10% in the Autonomous Stage. This process of motor learning provides not only the what and the how, but equally important the who, when, where, and why.[15]



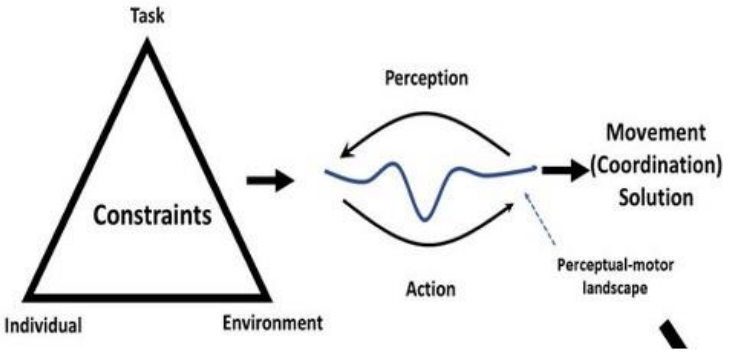


Figure 2: The Fitts and Posner model of motor learning.
Figure 3: Newell's constraints model.

Because the fireground is dynamic and rife with friction, our practice cannot remain static and sterile. Unlike the strict, choreographed repetition of traditional constant practice, which overemphasizes a single movement solution—an ideal technique—variable practice incorporates diverse conditions to promote functional adaptability and generalization of a skill. As neuropsychologist Nikolai Bernstein stated, "Practice is a particular type of repetition without repetition." As soon as an individual is capable of executing a movement, the skill should be practically applied in simplified drills that are scaled down to match their level of proficiency. By practicing a skill so the entire movement is performed and the individual is faced with meaningful variability along the appropriate dimensions, providing the affordances of real-time, relevant feedback, they "learn to coordinate their movements and make decisions based on the information they will use." Through the coupling of perception and action, this free-range approach to skill acquisition, known as the Ecological Dynamics framework, allows for exploration and self-organization.[16]

As proficiency is developed, constraints are incorporated throughout the course of practice, "quantified and prioritized based on probability."[17] There are three types of constraints, as proposed by University of Illinois professor Karl Newell: 1) Individual (e.g., physical

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[15] Aaron Fields, *Drilling for Function*, lecture, Fire Department Instructor's Conference (April 28, 2022); Rob Gray, *The Ecological Approach to Skill Acquisition*, The Finding Small Wins Podcast (Adam Loiacono, host), November 13, 2024; Aaron Fields, *Tip of the Spear Leadership Podcast: Drilling for Function* (December 8, 2025).
[16] Rob Gray, *How we Learn to Move: A Revolution in the Way we Coach and Practice Sports Skills*, Perception Action Consulting & Education, LLC, 2021; Rob Gray, *The Perception and Action Podcast: Variability of Practice – A Deeper Dive* (January 7, 2025); Christopher Samboy, personal conversations (2025).
[17] Fields, *Tip of the Spear Leadership Podcast*.

attributes and capabilities); 2) Environmental (e.g., terrain and weather); 3) Task (e.g., resources and parameters) (Figure 3).[18] Using a forcible entry drill as an example, a constraint could be restricting the space around the door, the tools allotted (or parts of the tool), limiting the number of participants, or obscuring visibility. Because the constraints are stressors, this type of drilling, known as the Constraints-Led Approach (CLA), can be leveraged as a form of stress exposure training. Doing so must be done incrementally in a prescriptive fashion (i.e., the Crawl → Walk → Run Model). The constraint applied should only push the participant just outside the edge of their comfort zone; not purposefully causing them to red-line into distress stress and fail.[19] By accounting for the complexity of the performance environment during the skill acquisition process, both externally and internally, procedural memory and the critical stimulus-response associations are formed, as well as the focused attention and dexterity to adapt and overcome. Because the motor problem is being solved throughout the spectrum of likely constraints, "context-conditioned variability" in the skill and neuroplasticity are developed. This type of practice also aids in refining the skill by improving the efficiency and timing of the movements to operate from a position of exploitation versus one of compensation.[20]

The success of these drills requires proper facilitation and intentional coaching, which includes assisting participants with regulating stress, particularly if they begin exhibiting signs of hyperarousal. Maintaining psychological and physical safety, at all times, is imperative. Performance must remain under constant evaluation to identify areas of improvement. When providing corrective feedback, it must be actionable and tactful, providing the desired behavior, not highlighting the deficiency. Target the highest priority issue after each iteration, and utilize analogies to aid in communicating the adjustment. This allows the participant to focus on that one aspect, and reduces the chance of overwhelming them or eroding their confidence. Once it has been addressed, move on to the next priority item; a process known as "fix like a funnel."[21]

By developing our competence, we build our confidence, which collectively promotes composure on the fireground—the trifecta of high performance. As we hone our skills, the more we can conserve our mental and physical capacity, and build our resilience. Decreasing our cognitive load increases our bandwidth, which allows us to better pick up on the subtle details and changes occurring around us. The more proficient we are with our processes and the more in tune we are with our environment, the more centered and responsive we will be.

Tactical Breathing and Routines

Upon recognizing you are experiencing symptoms of hyperarousal, ground yourself in the moment by first pausing and controlling your breathing. The lungs contain nerves that connect them to the ANS. To promote activation of the parasympathetic division, the breath should be slow, deep, and diaphragmatic; occurring horizontally through the abdomen versus vertically through chest. The inhales should come through the nose and the exhales should come through the mouth. Tactical breathing places emphasis on slowing the rate of breathing by extending the exhale (and incorporating either a breath-hold or an extra inhale). Because Box, 4-7-8, and Coherent Breathing techniques involve lengthy cycles and maintaining a count, they can be

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[18] Gray, *How we Learn to Move*.

[19] Fields, *Tip of the Spear Leadership* Podcast; Fields, *Drilling for Function*.

[20] Gray, *The Ecological Approach to Skill Acquisition*. Rob Gray, *The Perception and Action Podcast: The Legacy of Nikolai Bernstein* (January 23, 2018); Fields, *Tip of the Spear Leadership Podcast;* Fields, *Drilling for Function;* Gray, *How we Learn to Move*.

[21] Aaron Fields, *Drilling for Function*, lecture, Fire Department Instructor's Conference (April 28, 2022).

difficult to perform during an operation; making them better suited for responding to and following an incident. Cyclic Sighing, however, is simple and quick, which can make it the preferred method when actively engaged (Figure 4). When en route to an incident, possessing a response ritual (e.g., staging/donning your equipment and taking a drink of water or chewing gum) can serve as an intentional trigger for that process (Photo 2). The latter two of those routines are also functional, as saliva secretion is inhibited during sympathetic activation, which is the cause for dry mouth. You can also build this trigger into your operational practices, such as when scanning with the thermal imager; "take a look and take a breath."[22] The use of simple mantras in your routine (e.g., "You've got this." or "You've done the work.") can reaffirm your functional confidence by validating your capabilities; recalling past preparation and successes.[23]

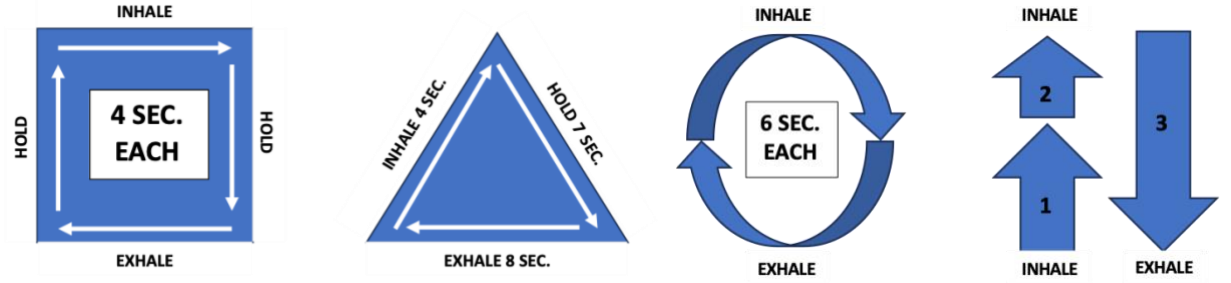

Figure 4: The process for Box, 4-7-8, and Coherent Breathing, which should be repeated for 4-5 cycles, ideally. Cyclic Sighing is less structured and intensive; simply requiring a deep inhale through the nose, followed by a brief second nasal inhale to fill the lungs, and a slow, extended exhale through the mouth to empty the lungs.

Resets

You can reset yourself during an operation to downregulate by pausing to adjust the focus of your eyes (along with your breathing). Because your eyes are linked to the ANS, intentionally softening your gaze to achieve a more panoramic view can activate the parasympathetic division by detaching from any visual fixations; counteracting the sympathetic tunnel vision effect.[24] As the visual field is increased, so is your level of alertness. This peripheral vision allows you to better assess and respond to the environment—improving reactions times by at least four times. The ability to modulate the focus of your eyes is essential to optimizing composure and situational awareness.[25] After zooming out, take stock of the situation to identify that which is pertinent to your operation. Once your eyes target something that requires your immediate and full attention, your eyes will naturally zoom in. Be sure to view things through the lens of opportunities versus one of obstacles. Remember, there are three things you can control to influence the outcome (the "3 As"): your attitude; your attention; and your actions. Utilize these insights to swiftly calibrate yourself and take corrective action. The key to effectively integrating these resets is the ability to sense the "rhythm" of an environment and recognize the fleeting moments of calm (similar to the pauses in music) where you can leverage that time and space.[26]

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[22] Jimmy Lopez and Jerry Smith, lectures, *NBFD Optimizing Human Performance 3* (November 3, 2025).
[23] Nate Zinsser, *NBFD Optimizing Human Performance 3* (November 3, 2025).
[24] Rich Diviney, *Masters of Uncertainty: The Navy SEALs Way to Turn Stress into Success for You and Your Team (Amplify Publishing Group, 2025);* Jason Brezler, Jimmy Lopez, Jeff Facinelli, and Mike Rudasill, *NBFD Optimizing Human Performance 2* (January 15, 2025).
[25] Dan Dworkis, *The Emergency Mind: Wiring your Brain for Performance Under Pressure* (Sangford Press, 2021); Jocko Willink, *A Masterclass on Solving Problems Right Every Time,* YouTube: Echelon Front (June 25, 2024); Huberman Lab Podcast, *Essentials: The Scene & Practice of Movement with Ido Portal* (February 5, 2026).
[26] Dworkis, *The Emergency Mind*.

Self-Talk & Mindset

Maintaining a competitive mindset (i.e., "playing to win") is essential to high performance.[27] Achieving your ideal mindset can be greatly enhanced by the following daily ritual, advocated by performance psychologist, Dr. Michael Gervais: 1) Breathwork (at least one round of tactical breathing) 2) Gratitude (expressing what you feel grateful for); 3) Imagery (envisioning yourself in your ideal state); and 4) Mindfulness (being present in the moment and possessing a non-judgmental awareness of yourself and your surroundings).[28] At the start of every shift, posing a challenge question to fellow firefighters (e.g., "We catching some work today?" or "You locked in?) is a motivational way to engage that mindset.[29] Internal dialogue is also a powerful force, as your brain is directly influenced by what you tell yourself—making confidence malleable. The "running total of your thoughts" is like a mental bank account—the deposits being optimistic thoughts and the withdrawals being pessimistic ones.[30] Optimism can activate the sense of safety in the prefrontal cortex and suppress the sense of fear in the amygdala.[31] Because pessimism has the inverse effect, negative thoughts must be filtered out immediately. "Your conscious thoughts influence your perception of the circumstances, triggering your unconscious emotion and physical state in response to the stimuli, and ultimately, determining your level of performance; creating a feedback loop."[32] Performance psychologist Dr. Nate Zinsser proposes the following three steps, with accompanying internal responses, when experiencing pessimism: 1) Acknowledge It ("Okay, I hear you."); 2) Silence It ("Stop!"); and 3) Replace It ("Refocus and Go.").[33] When encountering friction (internal or external), utilize positive self-talk that is constructive and process-oriented to coach yourself through it (Figure 5).

Photo 2: A pack of gum staged on the console, which serves as a routine that triggers tactical breathing and a reset to downregulate arousal when responding to a high-stress incident of potential consequence.

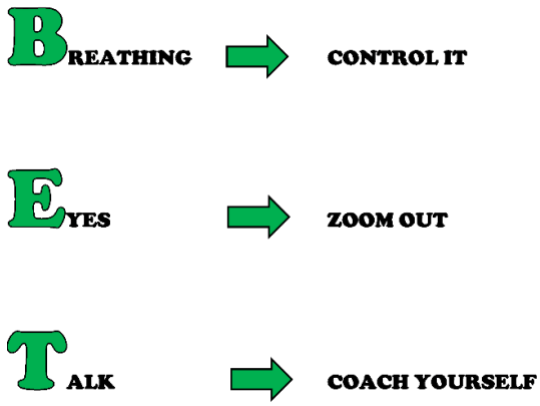

Figure 5: A simple acronym to serves as a mnemonic for the techniques of self-regulating hyperarousal.[34] When the chips are down, "BET" on yourself.

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[27] Michael Gervais, *The Finding Master Podcast: How to Stay Calm Under Stress with Dan* Harris (January 14, 2026); Brezler, Lopez, Fader, and Facinelli, *FDNY Mental Performance Initiative 13.*

[28] Gervais, *The Finding Master Podcast*.

[29] Ural Forbes, personal conversation (December 23, 2025).

[30] Nate Zinsser, *The Confident Mind: A Battle-Tested Guide to Unshakable Performance* (Mariner Books: January 25, 2022).

[31] Andy Morgan, *NBFD Optimizing Human Performance 3* (November 3, 2025).

[32] Zinsser, *NBFD Optimizing Human Performance 3*.

[33] Zinsser, *The Confident Mind*.

[34] Joanne Mariano and Kevin O'Connor, *NBFD Optimizing Human Performance 3* (November 3, 2025).

Firefighters must be opportunistic and focus on their processes (not the outcome) when executing critical tasks. However, they must also expect to face obstacles and be ready with contingency plans that are just as well-established and -practiced. By integrating them into our processes, the employment of a contingency is not deemed as a failure, "but as an opportunity to succeed using an alternate approach."[35] These processes must be simple and distilled into a set of easily recallable steps (e.g., "Gap → Set → Force" for forcible entry); a strategy known as chunking.[36] As FDNY Deputy Chief Jeff Facinelli asserts, "Simplicity is the answer to complexity."[37] The generalized patterns of chunks can be supported by specified patterns, known as schemas. Schemas create a mental catalog to organize those patterns into categories that can be readily accessed and offer a "flexible template for action," once their associated cues have been identified. This additional layer provides the "essential context—defining the situation and setting"—and therefore, what can be expected and how to respond.[38] Using the aforementioned forcible entry chunk, an inward-swinging, wood-frame door would be an example of a schema. In this scenario, the schema informs the typical occupancy and compartment type being accessed, as well as the techniques to employ, and how the door will react accordingly, based on its construction. These mental and physical processes must be continuously forged and honed for them to be successfully executed under the stress of the fireground.

When mistakes are made and setbacks are encountered, control your internal narrative. Dr. Zinsser also offers three ways in which to reframe negative experiences: 1) Temporary ("It's just this one time."); 2) Limited ("It's just this one place."); and 3) Non-Representative (That's not the truth about me.").[39] Keep repeating those steps until you achieve the desired end state. This growth-minded and iterative approach can create a stream of small, yet progressive victories. Generating this momentum leads to the body releasing a surge of dopamine, providing the motivation to keep you moving forward. The positive experience also releases the primary neurotransmitter and neuromodulator of the parasympathetic nervous system, acetylcholine (enhancing attention, learning, and memory), and subsequently, the release of nitric oxide; collectively slowing the heart rate and dilating the blood vessels to decrease blood pressure (vasodilation). Nitric oxide, which is further stimulated by nasal breathing, counteracts the stress hormones and neurotransmitters and increases the production of dopamine and endorphins.[40]

Performance on the fireground can be greatly facilitated when under the reassuring guidance of seasoned operators. During a stressful operation, the physical touch (e.g., a hand placed on the shoulder) and calming voice of a fellow firefighter, especially when personalized (i.e., using their first name) and injected with humor, can dramatically reduce arousal–bringing a firefighter back to or closer to center.[41] These interactions are incredible tools for improving resilience and overcoming adversity. When a personal connection is made, especially when laughter is evoked, there is a release of neurotransmitters and hormones—dopamine and oxytocin (responsible for social bonding and establishing trust)—as well as endorphins.[42]

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[35] Zinsser, *The Confident Mind*.
[36] Dworkis, *The Emergency Mind*; Fields, *Drilling for Function*.
[37] Brezler, Lopez, Fader, and Facinelli, *FDNY Mental Performance Initiative 13.*
[38] Legan, *Memory, Place, and Firefighting*.
[39] Zinsser, *NBFD Optimizing Human Performance 3;* Zinsser, *The Confident Mind*.
[40] DJ Shipley, *The Huberman Lab Podcast: How to Make Yourself Unbreakable (October 6, 2025)*; Diviney, *Masters of Uncertainty*; Lopez, *NBFD Optimizing Human Performance 2;* Rich Diviney, *The Attributes: 25 Hidden Drivers of Optimal Performance* (Random House, 2021); Kotler, *The Rise of Superman*.
[41] Brezler, Lopez, Fader, and Facinelli, *FDNY Mental Performance Initiative 13.*
[42] Diviney, *The Attributes*.

Reflection and Refinement

After every incident, the operation must be critically and objectively analyzed to evaluate performance and the efficacy of the tactics and techniques utilized. Conducting a 'hotwash' should be done immediately following an incident to discuss what took place. At the company level, each member must contribute by openly and honestly describing the incident from their unique vantage point and perspective; taking full ownership of their actions. The insights garnered from this debrief should then be used to complete a formal Post Incident Analysis (PIA) to capture these invaluable experiences and lessons learned. An After-Action Review (AAR) should then be held the next shift to review the incident as a whole with all of the companies involved. Reflection must also include a private self-assessment to hold ourselves accountable. This act of introspection, however, should be a daily practice, regardless of whether you operated at an incident of consequence. It is through this personal evaluation and exploration that we truly grow, both professionally and personally. These reflective practices are how operational and performance issues are diagnosed, and how we improve our understanding of the fireground, ourselves, and our processes; serving as the driver for future training and organizational change. They also allow us to process the residue from these incidents and reframe negative outcomes from losses to learning opportunities.[43]

Recovery and Wellness

The importance of recovery cannot be overstated. A high stress operation, can take a tremendous toll on the body. Even for those not engaged in sustained physical activity, there is significant strain incurred.[44] Until recently, the impact of the acute stress response on firefighters has yet to be quantified. Technological advances have led to biometric devices being readily available to the general public (Photo 3). These 'wearables' have the ability to accurately measure the level of stress the body has endured—both psychological and physiological. By capturing a variety of metrics—heart rate and heart rate variability (among other vital signs)—a cumulative strain score is calculated. Firefighters wearing these devices during high stress operations are routinely sustaining high heart rates above 180 beats per minutes (over the maximum heart rate typically experienced during intense exercise), with spikes in excess of 200 beats per minute; earning strain scores at the top end of the spectrum. Elevated metrics are repeatedly recorded during periods of hot and humid weather, which increases the thermal impact on the body and the cumulative strain incurred. These operations are rivaling and even exceeding the most extreme physical endeavors.[45] Because of the academic research being conducted by Leadership Under Fire, which has brought these concepts to the forefront of the fire service, there is now a legitimate data set for statistical analysis to prove this fact.

Firefighters must prioritize their wellness to withstand and recover from these sudden, high-intensity periods. Clean eating and hydration nourish the body (providing essential calories, nutrients, and water). Practicing good sleep hygiene to consistently achieve sufficient deep and rapid eye movement (REM) sleep restores the body. Engaging in regular anerobic exercise (calisthenic and weighted resistance training) and aerobic exercise (steady-state [Zone 2] cardiovascular training and high-intensity interval training [HIIT]), in addition to stretching and mobility (including myofascial release), strengthen and condition the body. With high demands placed on us all, professionally and personally lives, possessing an outlet (a "3rd thing") to

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[43] Moffitt, *The Fourth Pillar.*

[44] Brezler, Lopez, Dutton, *FDNY Mental Performance Initiative 13*.

[45] Jake Dutton, *NBFD Optimizing Human Performance 3* (November 3, 2025).

decompress is imperative to our mental health. Maintaining an enjoyable recreational interest, ideally one that is physical and community-based (e.g., Brazilian Jiu Jitsu), can have a seemingly therapeutic effect.[46] Recovery and wellness are a foundational component of human performance and longevity, and therefore, must be a lifelong commitment.

Photo 3: The Whoop, a wearable biometric device that tracks a variety of health and stress metrics to calculate daily sleep, recovery, and strain scores

Mental Rehearsal

While the volume of fire duty cannot be controlled, making fireground experience the limiting factor, there is much we can gain vicariously through watching film and intentional storytelling; the latter of which being a tradition that has been in existence since the dawn of time. We can also hone our abilities through mental rehearsal. Performance imagery is a practice that has been utilized by elite athletes for decades. Simply find a quiet place, and envision yourself successfully carrying out a specific operation, in the first-person view. Vivid imagery and evoking the senses are key to an effective session. By creating a psychosomatic experience, mental rehearsal can "activate many of the same neural structures and pathways that are engaged in the actual activity; the transmission becoming smoother and faster with each activation."[47]

Another cognitive exercise, developed by US Marine Corp Major John Schmidt, is the Tactical Decision-Making Game (TDG). Unlike conventional fire service simulations, TDGs possess a defined and relevant problem set, and incorporate realistic time restrictions to complete prescribed tasks (without a prefixed, garden path solution), as well as the issuance of orders (over the radio and/or face-to-face). Intentional moderation, which includes pointed, open-ended, follow-up questions, sparking constructive introspection and discussion, and a debrief, are essential to a successful TDG.[48] The more reps we perform and slides we insert into our mental deck, the better chances we have of finding a match and mitigating the problem-set being confronted on the fireground.

Decision-Making

Uncertainty is inextricably a part of our operational reality. Rather than futilely attempting to attain certainty, we must learn to cope with its absence. University of Massachusetts School of

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[46] Dan Dworkis, *The Emergency Mind Podcast: Dr. Preston Cline on Missional Critical Teams* (June 27, 2022).
[47] Zinsser, *The Confident Mind*.
[48] Phil Jose, *Fire Nuggets Framework Podcast: Episode 05* (October 9, 2025).

Medicine professor, Jon Kabat-Zinn, made the following analogy about this existential challenge we are faced with: "I cannot stop the waves, but I can learn to surf."[49] Sound decision-making amidst complexity requires acclimating to the environment, or "connecting the dots." Sensemaking is the ability to sift through the deluge of sensory inputs and home in on what truly matters; separating the noise from the signals. "Once the 'non-dots' are removed, the task of connecting the remaining dots is much easier." It is not the volume of information that makes the difference; it is the relevance. The cues we receive through our continuous size-up process must be interpreted in relation to our operational goals to identify any environmental pattens and determine what is to be expected. This is the difference between mere information and actual intelligence. Through this implicit system of recognition—involving intuition and mental simulation—we can rapidly and efficiently translate that intelligence into an appropriate action plan; a model developed by cognitive psychologist Gary Klein known as Recognition-Primed Decision-Making (RPD).[50]

The greater our understanding of the environment (i.e., fire dynamics and building construction) and the interrelation between our tactics and victim survivability, the greater our capacity will be to forecast what is to come, operate proactively, and outmaneuver the fire. Through the use of simple mental models, we can establish environmental and operational baselines. When we understand what "right" looks like, we can readily detect anomalies. An anomaly is any aspect of a situation that is atypical, which can be incredibly subtle and difficult to articulate (often described simply as "something does not feel right"). When you know what to look for and where, sound judgments can be made rapidly with minimal information (a technique known as thin slicing).[51]

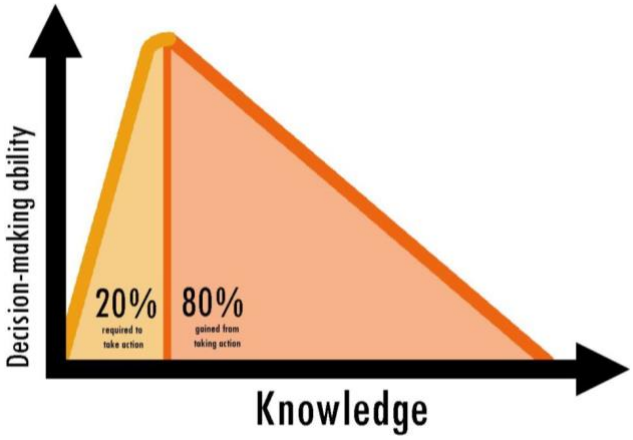

Figure 6: The steep knowledge-decision-making curve depicting the Pareto Principle (courtesy of Jay Bonnifield and Fire Engineering).

Equally important is recognizing when you have obtained enough information, reaching the "threshold for decision," and being able to select an appropriate intervention.[52] A common

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[49] Dan Dworkis, *The Emergency Mind Podcast,* Episode #119: Operating with Uncertainty with Drs. Eric Benoit and Andrew Petrosoniak (September 8, 2025).
[50] Gary Klein, *Street Lights and Shadows: Searching for the Keys to Adaptive Decision-Making (Echo Point Books and Media LLC, 2020);* Kotler, *The Rise of Superman.*
[51] Klein, *Street Lights and Shadows.*
[52] Patrick Van Horne and Jason Riley, Left of Bang: How the Marine Corps' Combat Hunter Program Can Save Your Lift (Black Irish Entertainment LLC, 2014).

misconception that can be an impediment to performance, is that more intelligence and options are better. The desire for information and "tools in the tool box," especially amidst uncertainty, can cause "paralysis by analysis." In reality, very little intelligence and only one appropriate option is needed to respond effectively. According to the Pareto Principle, 80% of the outcomes come from 20% of the inputs. Once that minimal critical intel has been obtained, the initial action taken will address the vast majority of the problem set. The feedback obtained from the environment in response will then provide the additional insights needed to successfully guide the remainder of the operation (Figure 6).[53] This principle represents the essence of the famous quote from US Army General George S. Patton: "A good plan, violently executed now, is better than a perfect plan next week."

Algorithms and Pattern Recognition

Having a calibrated system—comprised of a focused size-up process and a distilled hierarchy of tactics and techniques that is driven by the probable conditions in an algorithmic fashion (i.e., "if this, then that")—provides a framework for rapid decision-making. As Camano Island (WA) Fire Assistant Chief Aaron Fields states, "A finite number of technical options leads to infinite response patterns. While the pursuit of infinite technical options leads to restricted response patterns." Possessing an established progression improves ease and efficiency of execution by creating a "mental roadmap," particularly under high stress and when experience is lacking.[54] Because this type of thinking is linear, the algorithms are limited to the factors accounted for at the time of their inception. Addressing nuance and novelty, however, requires creativity. The ability to think laterally is directly correlated to expertise; making it the limiting factor.[55]

To describe this duality of thought, emergency physician Dr. Dana Sajed, made a musical analogy comparing linear thinking to playing scales and chord progressions (in accordance with music theory), and lateral thinking to improvisation. The rote "classical" methodology (linear thinking) provides the operational principles and practices (algorithms), which thrives when conditions are routine, or "black and white." The fireground, however, is graduated in shades of gray.[56] The conceptual "jazz" methodology (lateral thinking) transcends the fixed solutions within those boundaries though abstracting and pattern recognition (creativity).[57] By codifying and indexing the environment and our operations into templates, the interrelation of the core—the non-variable parts—and the slots—the variable parts—are identified (also known as Template Theory).[58] This deep understanding allows for the innovation and adaptiveness required to overcome friction when the situation becomes extraordinary and fails to fit the established molds.[59] It is imperative to note, possessing a defined system and competency in its application is a prerequisite. The framework it creates is "what makes it possible to improvise. Without it, you are just playing a bunch of sporadic 'notes' that never make sense."[60] High performance is, therefore, the ability to intuitively establish connections amongst those concepts,

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[53] Jay Bonnifield, *Research-Based Size-Up for Wood-Frame Apartment Buildings* (Fire Engineering, April 30, 2025).

[54] Fields, *Tip of the Spear Leadership Podcast*.

[55] Dworkis, *The Emergency Mind.*

[56] Kevin O'Connor, *NBFD Optimizing Human Performance 2* (January 15, 2025).

[57] Gray, *How we Learn to Move*; Fields, *Tip of the Spear Leadership Podcast*.

[58] Legan, *Memory, Place, and Firefighting*.

[59] Dworkis, *The Emergency Mind.*

[60] T.K. Coleman, *Improvisational Boundaries* (Retrieved from www.TheMinimalists.com/jazz on December 31, 2025); Legan, *Memory, Place, and Firefighting*.

techniques, and the environment, and immediately execute an appropriate solution for the emergent problem set.[61]

While algorithms, mental models, and heuristics can streamline the decision-making process, they are not infallible. Maintaining a holistic approach and an open mind are critical to avoiding the trap of cognitive biases; preconceptions manifesting from past practice, previous experiences, and early reports. These factors can become anchors that lead to cognitive dissonance and cause us to ignore warning signs when they challenge our initial assumptions or approach. Additionally, we must recognize the limitations of our knowledge and understanding, as an overconfidence in the depth and breadth of our expertise can lead to false intuitions and poor judgment (known as the Dunning-Kruger Effect). True experts know their limitations.

Photo 4: Decisive action is the lynchpin for a successful outcome, especially when lives are hanging in the balance (courtesy of the New Britain Fire Department).

Effectively implementing these concepts under the stress of the fireground requires a holistic approach and a disciplined praxis. The knowledge and skillsets must be ingrained to maximize their efficiency and minimize their imposed demand. We must possess the capacity to readily identify the pertinent cues, establish their contextual relevance to our environment and operational goals (recognizing patterns and expectancies), and rapidly determine an appropriate intervention (through mental simulation). This must be coupled with the physical ability and tactical fluency to execute, and a "bias for action" to seize opportunities and gain competitive advantage (Photo 4).[62] This proactive and agile posture enhances our reaction time and the overall efficacy of our operations.[63] With a resilient mindset, one which expects the occurrence of problems and is armed with contingencies and self-regulating techniques, we can harness our stress response and leverage it to prevail in the face of adversity. By enhancing human performance, we can deliver the best possible service to the communities we serve.

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[61] Kotler, *The Rise of Superman.*

[62] Daniel Kahneman, *Thinking Fast and Slow* (Farrar, Straus, and Giroux, 2013).

[63] Klein, *Street Lights and Shadows*.

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