The Rush: How Speed Can Save Lives

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"Speed is the essence of war."
— Sun Tzu

Basics of "The Rush"

There are only three individual movement techniques (IMTs) in the U.S. Army: the high crawl, the low crawl, and the rush.[1] These individual movement techniques can be traced back nearly 80 years in previous U.S. Army doctrine.[2] The movement techniques are to be utilized in the Soldier Skill Level 1 task number 071-326-0502, Move Under Direct Fire. Soldiers are to utilize the rush technique "when enemy fire allows for brief exposure" in order to move from one covered position to another.[3] Other key determinants for implementing the rush are when crossing open areas and when time is critical.[4] The following training guidance on how to properly execute the rush is provided to every Soldier either entering or currently serving in the Army (see Figure 1):

Figure 1

a. Move from your firing position by rolling or crawling.

b. Start from the prone position.

c. Slowly raise your head and select your next position.

d. Lower your head while at the same time drawing your arms into your body, elbows down, and pulling your right leg forward.

e. Raise your body in one movement by straightening your arms.

f. Spring to your feet, stepping off with either foot.

g. Run to the next position —

(1) Keep the distance short to avoid accurate enemy fire.

(2) Try not to stay up any longer than 3 to 5 seconds so that the enemy does not have time to track you with automatic fire.

h. Plant both feet just before hitting the ground.

i. Fall.

(1) Sliding your right hand down to the heel of the butt of your weapon.

(2) Breaking your fall with the butt of your weapon.

j. Assume a firing position.

(1) Roll on your side.

(2) Place the butt of your weapon in the hollow of your shoulder.

(3) Roll or crawl to a covered or concealed firing position.

k. Cover your buddy's movement with forward by fire.

Although specific guidance is given, a key piece of information is left out: how far should a Soldier run in 3-5 seconds? Research has demonstrated that mean engagement time is 3 seconds or less, so the discriminating factor of Soldier survival is not the time component of the rush but rather the speed of the movement.[5] Therefore, a goal speed at which a Soldier should rush needs to be determined as this ultimately drives training and directly impacts survivability on the battlefield.

Development of the Direct Fire Speed Score (DFS3)

In order to establish optimal rush speed, we examined difficulty involved in moving target engagement and consulted a marksmanship expert and International Sniper Competition winner and then devised a scoring system (see Figure 2).[6-7]

The DFS3 is based on the assumption that a target moving at 15 miles per hour or 6.7 meters per second would be extremely difficult to accurately engage. Based on this goal speed, we can score a Soldier on a simple 0-10 scale. The DFS3 will allow a unit to clearly mark targeted distances when conducting IMT training and adopt training strategies to increase Soldiers' speed on the rush. For example, to reach the optimal DFS3 of 10, a Soldier should cover 20-33.5 meters in a 3-5 second time span. Given this goal, a unit training plan should include targeted sprint training regimens to increase Soldier speed.

Interestingly, the goal speed of 6.7 meters per second is supported by historical data as the Army's Individual Efficiency Test from 1920 required a Soldier to run 100 yards in 14 seconds in order to pass, which would be 6.5 meters per second.[8] Given that the rush technique is attributed to German Storm Trooper "infiltration tactics" of World War I, and the 1920 Individual Efficiency Test was most likely based on lessons learned from the war, it is significant that the 6.5-meter speed goal was utilized previously and this goal is almost identical to the speed we determined independent of this historical information.[9] Furthermore, researchers created a Survival Probability Equation:[10]

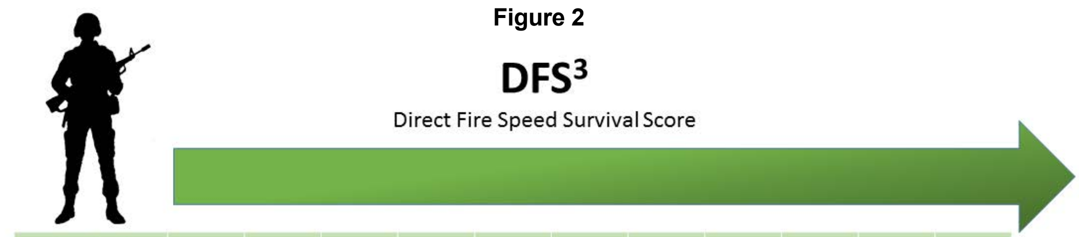
$$\text{Time}_{\text{shooting}} = \text{Distance/Velocity-Reaction Time}$$

$$\text{Shots} = \text{Time}_{\text{shooting}} * \text{Shooting Cadence} + 1$$

$$\text{Survival Probability} = (1\text{-Accuracy})^{\text{Shots}}$$

Based on this model, if two Soldiers had the same reaction time and had to cover 30 meters of exposed distance receiving enemy fire at a rate of one round per second estimating 20 percent enemy accuracy with Soldier A running 3.3 meters per second and Soldier B running at the goal 6.7 meters per second, the model would give Soldier B a 37 percent greater chance of survival. The increased chance of survival is directly

Figure 2



Survival Score		0	1	2	3	4	5	6	7	8	9	10
Speed	mph	0	1.5	3	4.5	6	7.5	9	10.5	12	13.5	15
	m/s	0	0.67	1.34	2.01	2.68	3.35	4.02	4.69	5.36	6.03	6.7

linked to the enemy being able to fire seven rounds at Soldier A versus two rounds at Soldier B. This scenario demonstrates the impact of speed training directly resulting in increased Soldier survivability (see Figure 3).

Another value the DFS3 provides is a field-expedient gauge to determine sprint performance degradation under load. Since the rush technique is to be utilized in a tactical scenario, the goal is for Soldiers to achieve a "10" score in their respective combat load. Given the established performance degradations caused by load, leaders can weigh the cost vs benefit of items based on weight especially if the items reduce Soldiers' speed to a rate where combat risk might be significantly increased.[11-13] Currently no equation exists for leaders to determine level of performance degradation based on load. Although a load-bearing speed model is currently being developed by researchers with velocity under a specific load being equal to a yet-to-be determined coefficient multiplied by load divided by bodyweight multiplied by maximum unloaded velocity — $V_L=C_1 \times (L/W_b) \times V_{UL}$.[14] By utilizing the DFS3 as an assessment of load-bearing performance, leaders can now adjust either load, training, or both to optimize Soldier sprint performance while maximally mitigating direct fire exposure risk.

Training for Acceleration and Velocity

One of the key attributes associated with acceleration and velocity is lower body strength.[15-16] However, given that much of the physical training that goes on currently focuses on the endurance-based, three-event Army Physical Fitness Test (APFT), many Soldiers are not maximizing their acceleration and velocity potential. As demonstrated by Jesse Mala and colleagues, one repetition maximum (1RM) back squat performance was significantly inversely correlated (-0.58) with 30-meter sprint times from the prone in Reserve Officer Training Corps (ROTC) cadets where push-ups, sit-ups, and the 2-mile run time had no statistically significant relationship to 30-meter sprint performance.[17] Since the relative strength of the individual will play more of a role in sprint performance than absolute strength, we recommend the following 1RM squat guidance adapted from Dr. Michael Stone for consideration: If the Soldier cannot squat two times his/her body weight, strength should still be considered a limiting factor in speed development.[18] Although the specifics of a comprehensive strength and conditioning program is beyond the scope of this article, readers may reference guidance provided by William Kraemer and Tunde Szivak in "Strength Training for the Warfighter," which is available at http://hprc-online.org/physical-fitness/files/STRENGTHTRAINING.pdf.[19]

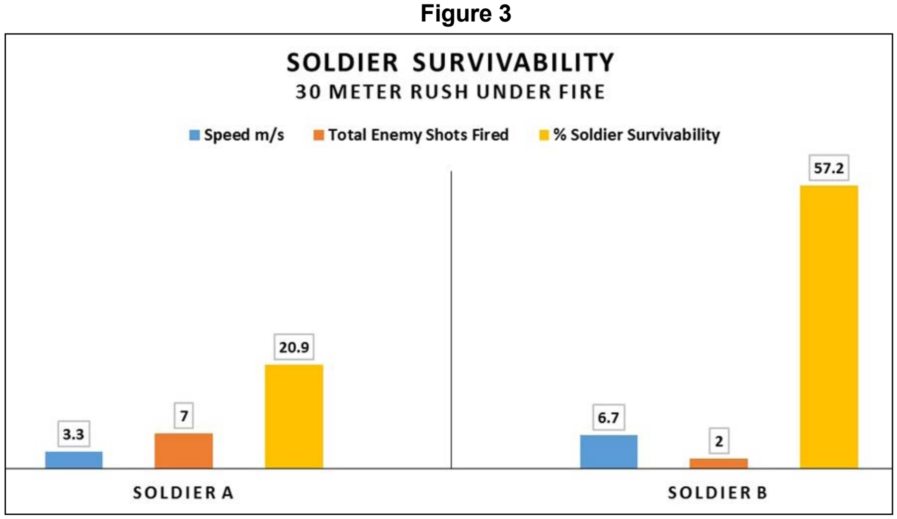
A concern some leaders may have with sessions solely focusing on sprint training is the lack of sufficient aerobic stimulus especially if training sessions are limited due to other requirements. A solution to improve both sprint performance while maximizing metabolic conditioning has been offered in the form of a "hurricane"-style workout developed by Martin Rooney.[20] Below is a field-expedient "hurricane" workout example that could be used by tactical athletes:

Physical Readiness Training (PRT) Movement Prep

1a. 30 meter (~33 yards) shuttle sprints from the prone for 30 seconds (goal is to complete 3-5 30 meter sprints in 30 seconds) x 3 sets
1b. Push-ups 3x10
1c. Overhead press 3x10
2a. 30-meter shuttle sprints from the prone x 3 sets
2b. Pull-ups 3x10
2c. Prone row 3x10
3a. 30-meter shuttle sprints from the prone x 3 sets
3b. Lunge 3x10 (each leg)
3c. Glute bridge 3x10

*For example, for set 1: A Soldier would start from the prone position, sprint 30 meters, and drop into the prone

Figure 3



position facing back at starting line. The Soldier would rapidly pop-up and repeat the 30-meter sprint prone scenario for 30 seconds. Once 30 seconds are up, the Soldier immediately goes into 10 push-ups followed by 10 overhead presses before repeating the 30-meter sprinting protocol.

Needed rest can be taken between each round and reduced as conditioning improves. This is just a sample program of how sprints along with auxiliary exercises can be incorporated into a physical training schedule while still maintaining conditioning.

Some key sprinting cues leaders can provide their Soldiers are:

- Keep center of gravity low and forward (lean forward)
- Push back from the ground with our feet (like trying to push a car forward as fast as you can)
- Keep elbows at 90 degrees, drive hard and fast with your arms with all movement generated from shoulders (faster arms move = faster legs move)

Another key consideration in Soldier sprinting versus traditional athletic models is the constraint of holding a weapon while sprinting. While we could not locate any research determining the specific sprint decrements this constraint may cause, the athletic model of field hockey reports an average 0.10 meter per second reduction from 2-12 meters when athletes times were compared to running with and without a stick.[21] Given this constraint, it is important for leaders to train sprinting with a weapon or appropriately weighted implement to maximize the specificity of the training. The slow addition of combat load over the training cycle is also key in both training and assessing your Soldiers' "real-world" sprinting ability.

In our most recent conflicts, tremendous advances in armor and medicine have resulted in exponential improvements in Soldier survivability. But even with these advances, as the leading trauma experts point out in the article "Death on the Battlefield (2001–2011): Implications for the Future of Combat Casualty Care," "as most pre-MTF (Medical Treatment Facility) deaths are nonsurvivable, mitigation strategies to impact outcomes in this population need to be directed toward injury prevention."[22] One such overlooked mitigating factor is the speed of the Soldier. By shifting physical training focus from purely endurance-based runs to a more sprint-based approach, leaders can actively increase their Soldiers' chances of being "left of the boom" and having the luxury of not relying solely on armor and medicine for survivability.

Notes

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Martin Rooney is the founder for Training For Warriors and currently serves as its head coach. Rooney holds a master of health science degree and bachelor of physical therapy degree from the Medical University of South Carolina. He also earned a bachelor's degree in exercise science from Furman University. Martin is an internationally recognized strength coach who as a partner with the Parisi Speed School, developed one of the top NFL Combine training programs in the country producing the fastest athlete at the 2001, 2004, 2005, and 2006 NFL Combine. Martin has served as speed consultant for several NFL teams to include the Jets, Giants, and Bengals as well as multiple NCAA football teams to include Arizona State and the University of Alabama. Martin has worked and consulted with tactical athletes at the 101st Airborne Division and the 75th Ranger Regiment.