



By Tyler Inman

In [Part 1](#), you learned that *overload* must occur to increase fitness. Overload drives adaptation by creating enough stress to elicit a response. The key is a slow, smooth progression commonly referred to as *progressive overload*. Part 2 will describe both the types of movements we should overload and the appropriate prescription to train each component of fitness.

### **Underlying Theory 2: Specific Adaptation to Imposed Demands (SAID Principle)**

The body's optimal response to stress is to increase the resistance to the initial stress so that we are more prepared the next time we face it. This favorable adaptation is specific to

the stimulus. In other words, the training effect correlates directly to the type of training. Great endurance runners typically train using some combination of long-distance, aerobic training. Their physiology is fine-tuned for aerobic endurance work in the modality of running. Great endurance runners, despite good, hard training, are probably not great long jumpers because they do not frequently train in the *power* domain. Likewise, despite a great aerobic engine, they may not be great long distance swimmers because they do not train frequently in the swim modality.

This brings to light two key applications of the SAID principle: We must train specifically for the types of movements we intend to perform (the movement modality) and for the specific component of fitness we desire to exhibit (the fitness component or domain).

### **Application 2a: Types of Movements**

Unlike the APFT, the ACFT requires more than just flexion of the trunk during the sit-up and the ability to run in a straight line. The ACFT actually requires Soldiers to move through multiple planes using a variety of movement patterns. In training to perform well on the ACFT, Soldiers now have the opportunity to train like an athlete – the same type of training that will serve them well on the battlefield. There are six key movement patterns Soldiers should train specifically to improve performance: hinge, squat, push, pull, rotate, and lunge. When combined with training in a variety of modalities (running, jumping, dragging, carrying, change of direction), deliberately training each of the aforementioned movement patterns (especially under load) will significantly improve Soldier performance on the ACFT.

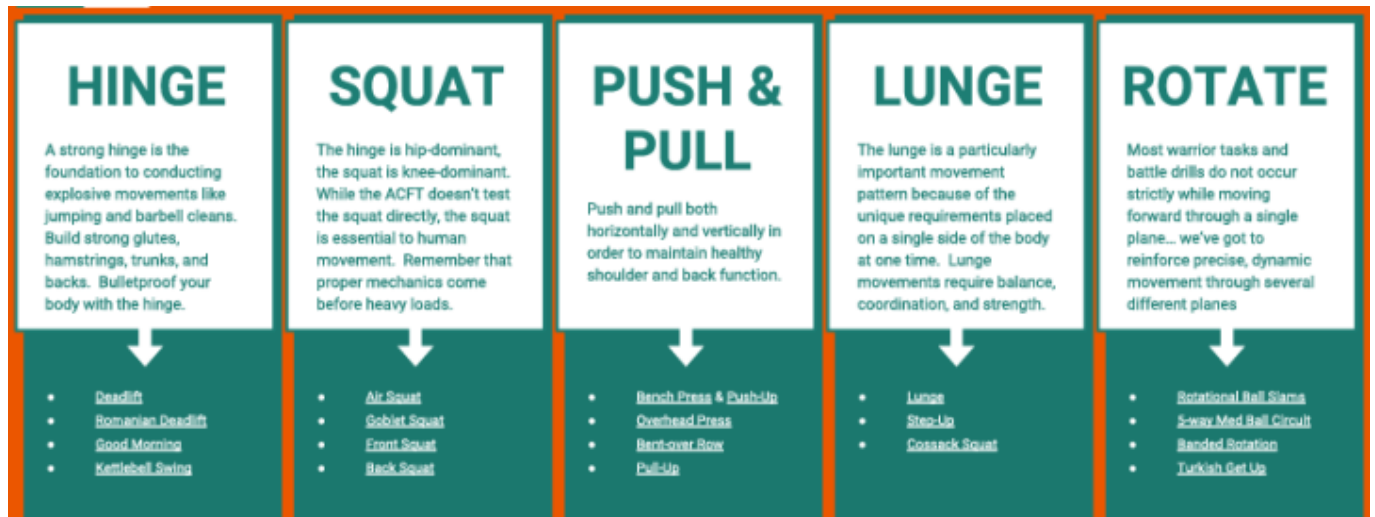


Figure 4 – Precise Pattern 6

### Application 2b: Domains of Fitness

Not only does the ACFT require new and different movement patterns, but it also requires more capacity in the muscular strength and anaerobic endurance domains. Capacity in each of the domains of fitness — muscular strength, muscular endurance, anaerobic endurance, and aerobic endurance (only 2 of which are tested via APFT) — are the result of very different physiological characteristics and adaptations. Accordingly, the different domains of fitness are effectively trained and improved via different means. For example, lifting light weights for high repetitions may improve muscular endurance, but it does not contribute to building strength. Strength, defined as the capacity to exert force against maximal resistance, is best developed by lifting relatively heavy loads for fewer repetitions. This brings to light the second application of the SAID principle. In order to improve performance in each of the fitness domains, one must train under the specific conditions known to develop a given domain. The following chart outlines the appropriate intensity and volume for training each of the domains of fitness.

		Intensity	Volume	Get it right for gains...
1	<b>Muscular Strength</b> The capacity to exert force against a maximal resistance	> 80% of 1RM	2-5 Sets < 8 Repetitions	<ul style="list-style-type: none"> <li>• 1RM = 1 Repetition Maximum</li> <li>• Load = amount of weight</li> <li>• Intensity described as a % of 1RM</li> </ul>
2	<b>Muscular Endurance</b> The capacity to exert force repeatedly or hold a static contraction	50-75% of 1RM	3-6 Sets 10-20 Repetitions	<ul style="list-style-type: none"> <li>• Volume = the total # of repetitions performed</li> <li>• Includes Isometrics - holding a static contraction for an extended period (like planking)</li> </ul>
3	<b>Aerobic Endurance</b> Low intensity, continuous, sustainable work for greater than 4 minutes	9-14 RPE or < 75% or MHR	Usually longer than 30 minutes	<ul style="list-style-type: none"> <li>• RPE - Rating of Perceived Exertion on a scale from 6-20</li> <li>• MHR - Max Heart Rate (estimated using 220 - your age)</li> </ul>
4	<b>Anaerobic Endurance</b> Short-term, high intensity work with energy demands that exceed aerobic capacity	14-20 RPE or > 75% MHR	Short, intense bouts less than 90 seconds	<ul style="list-style-type: none"> <li>• Anaerobic Threshold - the exertion level at which anaerobic metabolism supplies the majority of the energy needs as a result of increased intensity</li> <li>• HIIT - High Intensity Interval Training</li> </ul>

*Figure 5 - How to train each component of fitness adapted from the ACSM's Guidelines for Exercise Testing and Prescription*

The SAID principle directs the application of progressive overload. It helps us understand exactly *where* and *how* we should overload the body to drive the desired adaptation.

Part 3 will further expand on these ideas to describe the *when* aspect of training. When should we program a change in variables? When should we change the type of training? When are we most prepared to meet mission demands?

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