Preface

As peak performance for the elite athlete continues to take center stage across all athletic endeavors, the balance between training and recovery has been brought to the forefront. The importance of "recovery" has become an aspect highly valued in regards to performance. This recovery piece of performance can only be applied at a high level when the functioning of the elite athlete's organism and systems are understood to a higher level. Although this is a current topic of interest to many, it is commonly applied in a broad fashion merely with an attempt to cover our bases. If an off-season strength and conditioning program was approached with this mentality, having no thoughtful progression or reasoning for its structure, it is likely a coach would not see tremendous results in performance while also potentially increasing the likelihood of injury to their athletes. It should also be noted that any overemphasis of recovery tactics is likely hindering an athlete's performance, rather than aiding it. As with most things in life, balance between stress/training and recovery will determine an athlete's long-term, repeated success at an elite level. This manual serves to introduce new concepts and methods as well as those that are better understood by many. This will continue to allow recovery to be provided based on an athlete's individual needs.

Performance gains are only realized when recovery is applied (adaptation takes place within this timeframe). However, the timing of this recovery for adaptation is also imperative to future success (in-season vs. off-season, time of week, physiological system it is applied to). Common examples of potential poor timing are provided below:

1. Over-utilization of recovery methods during off-season training. This may hinder adaptations realized, ultimately reducing the effectiveness of the program implemented.
2. Completing recovery methods post-practice or game immediately before an off day. This could inhibit the body's ability to recover throughout the season.
3. Implementing recovery methods to a high extent immediately at the start of the season, which could lead to reduced ability to recover in the later portions of the season.

The most intriguing "newer" recovery methods throughout this manual involve that of the neurologic system. This system serves to provide constant feedback to the body to create spatial awareness and other basic "mapping" of the body. Although the availability of recovery techniques are vast, the

majority of these recovery tactics can be placed into one of three categories. These three categories include the proprioceptive, the visual, and the vestibular systems. The modalities targeting the proprioceptive, or movement, system within the body are already widely utilized and understood. However, the visual and vestibular systems are much less understood, let alone addressed or "recovered".

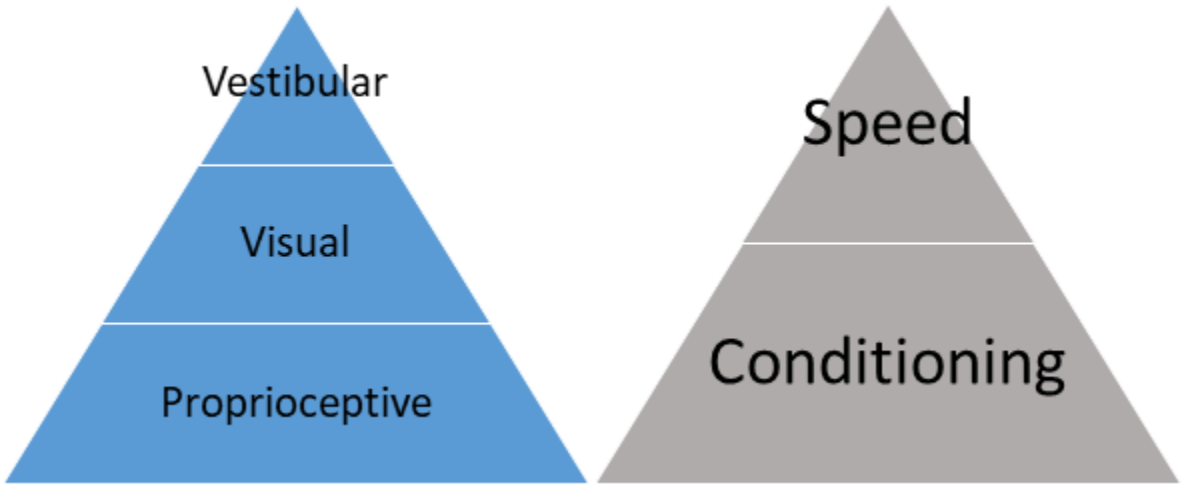
If the visual system is overlooked, many imbalances throughout the body can become increasingly dangerous. A simple example can be that of one eye being dominant. Eye dominance may seem relatively small in the grand scheme of recovery and performance, but this increased input to a particular eye will result in a head tilt that provides greater input to this eye. Again, although this seems minor, consider the cascade of events occurring within the body and small alterations in muscular function that must be altered to address this shift. This new head position now requires a new "center" of where the body feels it is in space, alters posture, and ultimately changes the ability of the body to move in a safe and effective manner. Each of these specific components will be covered throughout this manual, but the concept of addressing a central problem is key in this process. These central, neurologically driven methods can lead to rapid changes throughout the entire peripheral system. Coaches must ensure they are not overlooking a massive underlying system within the body of an athlete.

The vestibular system, which provides information about motion, head position, and spatial orientation, is constantly working at the foundational level due to gravity. When this information becomes increasingly "off" the body begins to stray further from a balanced position. This leads to changes in posture and muscle recruitment strategies particularly when attempting to create extension. The size of one glute to the other, the gait pattern of an athlete, especially one with a pigeon toe stride, as well as postural changes can all be signs of a vestibular system malfunction. Regardless of the "corrective exercises" or "prehab" applied, the central problem will not be addressed. If the maps provided by the brain are poor, then nothing else from a movement or proprioceptive standpoint will alter the issues seen.

As one of these systems becomes overstimulated relative to another, compensation patterns at the neurological level will become apparent. Just as these "cheat" patterns can be seen throughout the proprioceptive system in movement, the same applies to the brain and neurology of the body. In all reality, the "cheat" patterns viewed in the proprioceptive system stem from a neurological disorder. We

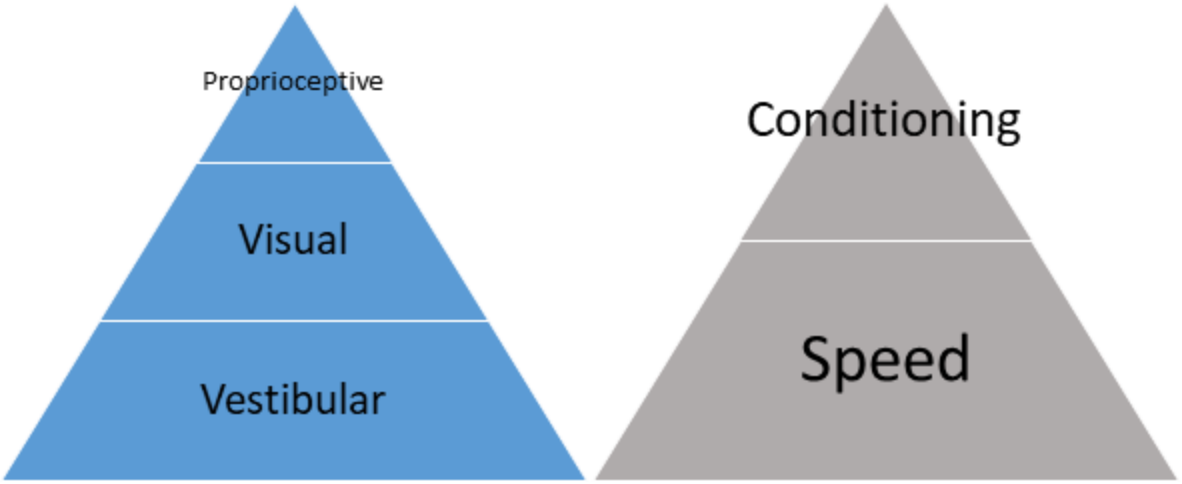
as coaches must continue to work on viewing the body through a neural lens, which allows for the greatest, most immediate changes to be realized in our athletes.

With recovery methods typically aimed at the proprioceptive system, the pyramid below on the left, demonstrates the most common approach taken by coaches in regards to athletic performance. This gives the proprioceptive system the foundational qualities and focuses on the brain (visual and vestibular) as the final piece of the performance puzzle. We feel this fits closely to the old school model that places volume/conditioning as the foundation to speed. Speed is a rare commodity that should be given the utmost importance in training. When speed is not available, it is irrelevant how "conditioned" an athlete is, they simply will not win the races and battles commonly required in athletic competition.



Figures 0.1 and 0.2: The "typical" manner in which both recovery options as well as training for speed have been approached in the past.

Rather than place emphasis on the proprioceptive system, we have come to the conclusion that this pyramid should be flipped, making the vestibular, visual, and other neurology components the more important aspects in performance. This manual represents the early stages of a paradigm shift in the approach to recovery methods. Placing a greater emphasis on the brain and its underlying aspects of recovery, rather than the more peripheral, proprioceptive system. Similar to the recent adjustment by many coaches placing a greater emphasis on high quality training (speed) over volume (conditioning), when power is given to the brain and neurology is given priority, tremendous results can be rapidly realized.



Figures 0.3 and 0.4: The new manner in which we feel each of these components, both recovery options and training for speed should be approached. These place the most critical aspects at the foundation of recovery and performance.

We are beginning to understand the importance of the CNS in performance, particularly placing an emphasis on this skill over muscular hypertrophy. However, the visual and vestibular systems serve to provide the body with its own "map". If this map is not keeping the body centered and balanced, no amount of training will lead to the greatest improvements in performance or recovery. We, as coaches, will always find more answers from the brain than with the proprioceptive system. No one looks at the eyes of someone with tears streaming down their face, rather we would look for the underlying source of their pain, which has led them to the crying. Unfortunately, this same logic is not applied to an athlete in regards to recovery. Many times only the source of pain, such as a muscular strain, is considered and treated, rather than the underlying cause of their dysfunction.

If we are constantly keeping these systems functioning at the highest levels, we provide our athlete's brain exactly what it desires and training is tremendously enhanced. When the visual and vestibular systems are understood as the foundation for the body's "map", their importance becomes exponentially increased. When these systems are aligned appropriately, we reduce the likelihood of our athlete's sustaining an injury while also enhancing their performance. These topics will all be covered throughout this manual to provide a more in-depth understanding of athletic performance and brain function.

The introduction of the neurology component into the aspect of recovery serves to provide enhanced recovery to all other systems within the body. Each of these systems will be covered in a later section of

this manual. However, we felt it was important to introduce this topic early on to lay a new foundation to the approach of recovery and the available methods.

Although specific examples will be provided throughout this manual that we, the authors, feel are optimal, it is absolutely critical every coach realize that each athlete is an individual and will require modifications. For this reason, not only the specific recovery methods, but also the concepts applied to achieve them are covered throughout this manual. Returning to the understanding that each athlete, and their recovery requirements are individualized, the implementation of these concepts will allow every coach to create a program specific to each athlete's needs at that specific moment. The introduction of the "Load Recovery Trigger" will also aid in the understanding of each athlete's needs.

The concepts and specific recovery methods presented throughout this manual represent ones of both evidence based as well as theory, with theory meaning the methods have not been "proven through research" at this time. However, we feel, based on our experiences and findings with these methods, they likely will be proven within a short time frame due to the performance gains our athletes have experienced when they are applied appropriately. As performance coaches we are ultimately concerned with the human organism and its ability to produce extreme acts repeatedly, as required in elite level athletics. In order for the training of these acts, the specific physiological adaptations required to achieve these highly skilled performance abilities must be understood to the very least at a basic level.