



Chaos Theory

Jim Smith, CSCS

Introduction

It is funny, looking back, how I got started with this project. I actually had an epiphany one day while watching some sporting event. The basis of the inspiration began with the realization of how completely non-linear sports are even though our preparation for its demands are dictated by linear movement patterns. My initial hope was to write a unique article and open up people's eyes about this concept, but as I started writing down my thoughts, it turned into much more.

Now, over a year later, the *Chaos Training* manual is complete.

In the *Chaos* manual, the question I was trying to answer was – “What is *Chaos Theory* and what, if anything, did it have to do with sports?”

I think at this point, I can answer these questions.

But first, let's look at a quick definition.

Definition of Chaos

- *noun*

- *state of confusion, lacking any order*

Sport, by nature, is chaotic. Moment to moment, you can observe unpredictable reactions and random expressions of power (strength x speed.)

The athlete reacts in response to:

- § the actions of another athlete,
- § the ever changing position of the sporting implement,
- § their own performance dependent upon their current level of preparedness,
- § the weather,
- § the playing surface,
- § deviations from the normal execution of a scripted play or sequence.

The list goes on and on...

We know that the goal of any good strength and conditioning program is to prepare the athlete for the demands of their sport and their performance is directly related to the accuracy of this determination.

This is done through the analysis of the athlete's needs according to the requirements of the sport.

Bridging the Gap

Excerpted from the Chaos Training manual

“Chaos Theory as demonstrated by Edward Lorenz in 1960, suggests that as a small random change is introduced into a system, it causes a ripple effect that can overwhelm and change the long term behavior of the system. Henri Poincare further determined that unless these initial changes could be defined and measured, the outcome or deviation caused by these ripples could never be predicted.”

So, by definition, if sport is random, then the outcome and the athlete's sequential reactions as they progress toward that outcome – can never be predicted.



Never saw that coming.

Our only hope is to increase the athlete's *potential* to react and execute with optimal levels of strength, speed, agility, endurance, strength mobility and sport specific skill to elicit a positive result.

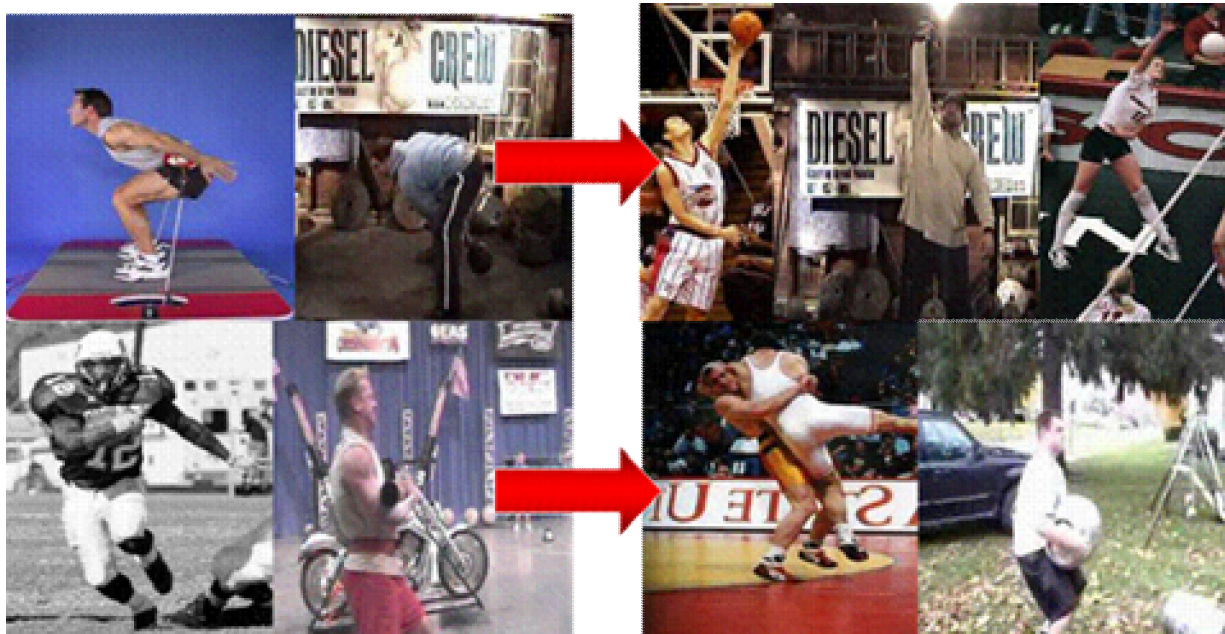
Over the last couple years, strength coaches have been trying to build upon and enhance the adaptations derived from maximal effort,

dynamic effort and repetitive effort strength training, i.e. means developed with linear, fixed movement patterns. Ian King loosely defines these patterns as; horizontal and vertical push/pull, hip dominant and quad dominate.

Training **GAP** Sport

Bridging the Gap

Recently, strength coaches have been trying to “*bridge the gap*” from these spatially fixed, optimally executed strength training means to sports performance by incorporating non-conventional protocols that provide very unique adaptations –i.e. random movements and dynamic loading of the athlete. This is why you’ve seen the recent integration of odd object and strongman training protocols.



Potential odd object and strongman training carryover to sport performance.

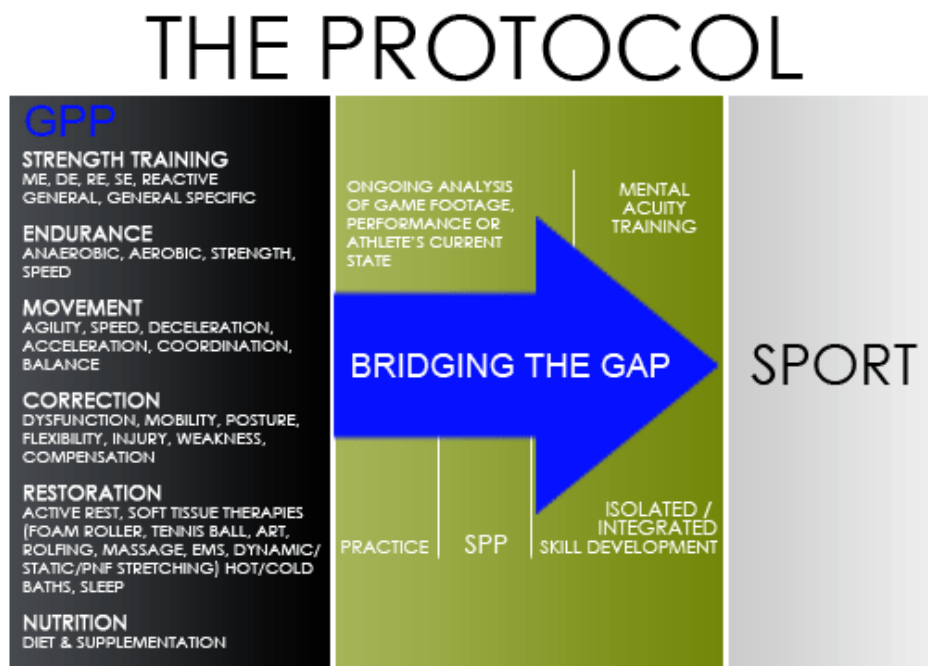
Your neurological and physiological systems don't know the difference between a barbell, sandbag or kettlebell - they just understand "mass" and the orientation of this "mass" in relation to the athlete.

Anyone can put a sandbag on their shoulder and squat or do kettlebell pullthroughs...

But, it is not what you use, but how you use it – that is important.

Current Strategies

How do we currently address ensuring sport specific carryover from our training programs?



Can we do better?

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Chaos Theory

I believe so.

Chaos Training

Excerpted from the Chaos Training manual

"... a reactive means by which potential cumulative improvements in strength, reactivity, kinetic coordination and cognitive response can be attained and produced by non-linear, random stimuli in a progressive training environment where adaptations are achieved by overcoming a destabilization of the kinetic chain, generating a potential reactive "shock" expression and improving the athlete's ability to generate and absorb force."

What does this mean?

Can we still build strength if the training environment is random? If we do create a supplemental set of strength training means that improve reaction and promote reactive strength expressions, will it build upon the adaptations we've already developed with fixed movement patterns?

Yes on both accounts.

To further explain, let's look at a chaos exercise.



Cross-Banded Supermans

Excerpted from the Chaos Training manual. You'll notice the chaos factor rating. A rating is assigned to each exercise dependent upon its difficulty (1 being the lowest) and adherence to specific criteria.

We will be taking Supermans to a whole other level. The setup involves the athlete hooking a band (size dependent upon their current strength and bracing proficiency levels) around one foot and grabbing with the opposite hand. The athlete will then brace and extend the hand and foot attached to the band outward and lock into place – that's one rep. The goal is to hold this end range position for a specific length of time OR to perform multiple repetitions.



Cross-Banded Supermans promote transverse bracing and coordination

Each rep is completely different from the preceding and the athlete will be forced to rapidly adjust throughout the duration of the exercise.

The incorporation of training means that are non-optimal and unpredictable in nature, will improve the athlete's ability to react and after this reaction, quickly return to homeostasis for next step patterning.

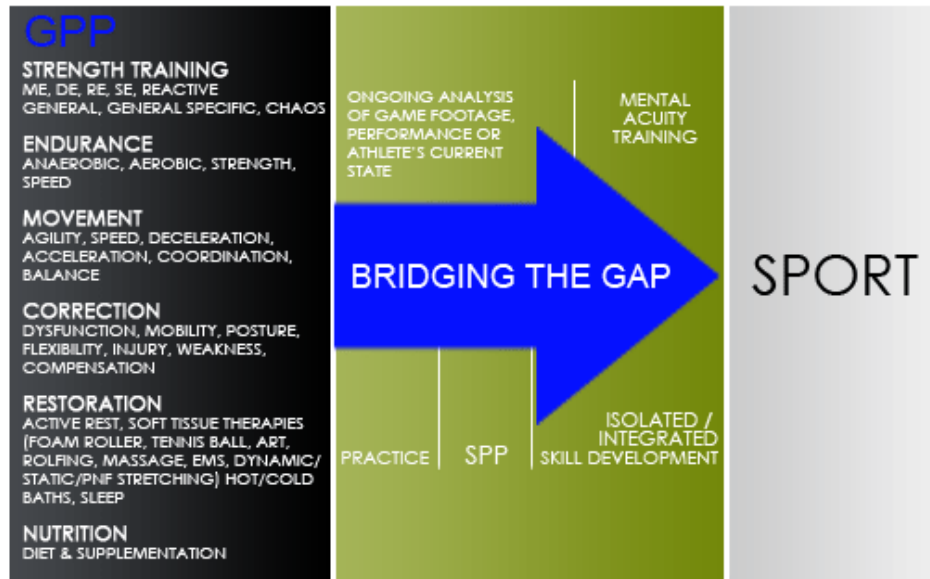
Chaos Training is meant to be a supplemental means incorporated into your current strength program with the intention to further "bridge the gap" between our GPP (general and general specific) training and sports performance.



Chaos Assisting to Bridge the Gap

You can now see we've added *Chaos Training* under the Strength Training category.

THE PROTOCOL



When attempting progression from novice to advanced, the initial effort and energy required to execute and overcome the demands of a movement are very high. As proficiency is developed, energy is saved and the optimal sequencing can be patterned.

Incorporation of *Chaos Training* into your strength programs will greatly improve your athlete's ability to; react quickly and efficiently, absorb and generate forces and re-stabilize after expression in preparation for the next demand.

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About the Author

Jim Smith is a performance enhancement specialist with the Diesel Crew. Jim dedicates himself to studying, developing and enhancing athletic performance through the utilization of conventional, non-conventional and grip strength training protocols. Jim is a lecturer, author and member of the EliteFTS Q&A Staff. Jim has been published by Men's Fitness and also regularly appears on EliteFTS.com, TotalPerformanceSports.com, FightersReview.com and many other sites.

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