



# PERFORMANCE BASEBALL/SOFTBALL CONDITIONING

A NEWSLETTER DEDICATED TO IMPROVING BASEBALL AND SOFTBALL PLAYERS

Volume 16, Number 6

## Strength Based Training vs. Velocity Based Training

Strength based training has been around every since the mythological Milo lifted a calf everyday until it became a bull of huge size and weight, leaving Milo "as strong as a bull" introducing the principle of progressive overload.

To review strength training has some basic definitions that need to be remembered:

**External resistance:** Using tools and implements beyond the athlete's body weight to provide resistance.

**Weight Training:** Using specific tools such as barbells, dumbbells, and weight machines to provide external resistance as overload.

**Resistance Training:** The use of any tool, including the athlete's own body weight, to provide overload.

**Overload:** The creation of a training situation where additional stress is placed on the body.

**Repetition Maximum (1-RM):** The maximum amount of external resistance an athlete can use when performing an exercise successfully, using perfect technique, one time.

**Predicted Repetition Maximum:** The use of a conversion formula to predict the one repetition maximum of a weight training exercise. A pre-determined weight is selected. The athlete performs as many repetitions as possible using perfect technique. The amount of weight used and the number of successful repetitions are compared to the conversion formula, which gives a prediction of what weight the athlete might be able to lift successfully one time.

This method is tried and true.

## Enter Velocity Based Training

Velocity based training is a new way to determine load for strength training. Velocity based training is a form of autoregulation training that uses the speed of the exercise to program the optimal weight for each set, in real-time. "Speed" in the context of the above definition can be more narrowly defined as the average concentric velocity (i.e. avg. meters/second of positive rep over each set). In simple terms, focusing on trying to move the bar at a certain velocity instead of trying to use a certain weight is a great way to increase the effectiveness of your workouts. This helps you more accurately find an exact workload for that given day. In an environment with stressors around every corner, it is crucial for development to identify when those fluctuations happen and accommodate, rather than failing a lift due to intensity, or overtraining the targeted intensity level. . By utilizing Velocity based training, we can set a speed appropriate for the adaptations being desired and the student athlete stays in that target speed regardless of actual number on the bar.

Which is better? It is beyond the scope of this editorial to determine this. No two conditioning programs are alike. If something "fits to a T" then it's perfect for your purpose and no one else. We have come up with a 7-T system to fit you to your T to get your athletes fit to perform at their best. Our mission is to present the latest methods of becoming a better athlete.

Be sure to continue to look for more information on this and other ways of increasing athlete performance and reduce injury through conditioning.

Something to Think About

Ken Kontor, Publisher

**Acknowledgement:** Brett Longobucco Castleton University strength and conditioning coach for his velocity based training contribution.

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Library LINKS - From the "Fit"-to-a-T" 7-T System of Program Design Library

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**#2** Strength exercises should be done in a safe environment.

**#3** Avoid Muscle Compensation by

- Having muscles move (fire) in the proper sequence to insure proper technique.
- Not loading too much weight that encourages improper technique.

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# PERFORMANCE BASEBALL/SOFTBALL CONDITIONING

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Volume 16, Number 6

## ***MOST YOUTH BASEBALL PLAYERS ARE BROKEN!***

*Phil Loomis, President Baseball Fit*

*Phil Loomis is founder of Baseball Fit an educational resource/coaching service. Baseball Fit provides current and relevant information to the youth baseball community (ages 8-18) through the Complete Baseball Performance program.*

**BGN  
INT  
ADV  
TI**

I recently had the opportunity to meet with several high-level folks within the baseball community. I wanted to share the information that came out of these discussions. The topics and points of view are extremely relevant to the developing baseball athlete.

**Carlo Alvarez** - Sport Performance Coordinator of the Pittsburgh Pirates

**Chris Walter**- and his Strength and Conditioning Staff with the Detroit Tigers

**Rick Riccobono** - Chief Development Officer for USA Baseball.

From these conversations, I have the following random thoughts and comments with more explanation in the weeks ahead.

### **Carlo Alvarez- Formerly with the Pittsburgh Pirates**

I've known Carlo for many years and his insight is so valuable because he has worked at the Major and Minor League level in addition to leading the athletic development program for prep football powerhouse St. Xavier in Ohio for nearly a decade.

- Early specialization is a HUGE problem affecting Major League's! They are so beat up when Carlo gets them he has to spend an inordinate amount of time just cleaning them up.
- For first year pro's the emphasis is on re-sets/regressions because of muscle imbalances/asymmetries.
- Focus on developing QUALITY strength, master body weight first.
- First 6 months with the Pirates workouts are nothing more than 1 hour long warm-ups, teaching athletes to become efficient movers with emphasis on Fundamental Movement Skills (FMS) like crawling, jumping, skipping, carrying, hanging...
- You don't win championships freshman year or in rookie ball. What you should do is establish your culture and environment. Athletes need to understand your methods and terminology.
- Establish progressions and regressions for each athlete with the team context. Don't lump everyone together! Chronological and Developmental age don't match up.
- Early specialization is a DISORDER as in you missed the order.

Symbols to Success  
Articles preceded by:

**BGN** indicate author believes content is for beginning-level athletes with training age of 0 to 2 years.

**INT** indicates author believes content is for sport (intermediate)-level athletes with training age of 2 to 4 years.

**ADV** indicates author believes content is for expert-level athletes with training age of over 4 years.

NOTE: Training age year is continuous year-round conditioning beyond just playing baseball/softball.

**R** following articles indicates the content has been reviewed by the editorial board.

**O** following articles indicates the content is the sole opinion of the author.

Article preceded by a T + a number 1-7 indicate the article is relevant to one or more T's in our 7-T system of program design.

**T-1**= Training Age (see above)/History

**T-2**= Time

**T-3**= Tools

**T-4**= Teaching

**T-5**=Testing

**T-6**=Total Workload

**T-7**=Team Position

To find out more about Fit to a T program go to:

[www.performancecondition.com/ultimate-conditioning-library/baseball](http://www.performancecondition.com/ultimate-conditioning-library/baseball)

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PROFESSIONAL BASEBALL STRENGTH  
& CONDITIONING COACHES SOCIETY

Brought to you  
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NATIONAL HIGH SCHOOL BASEBALL  
COACHES ASSOCIATION  
and  
NATIONAL FASTPITCH COACHES  
ASSOCIATION



## MOST YOUTH BASEBALL PLAYERS ARE BROKEN

- Results = movement inefficiency, asymmetries and muscle imbalances, stress fractures, over-use injury. Athletes are all chewed-up due to lack of progression all thrown into advanced/high intensity programs and their bodies can't hold up.
- Of the 40 athletes the Pirates drafted in June 2015, 75% came BROKEN!
- The Pirates have 3 phases to their training program. All but one of the draftees had to be regressed below Phase 1, not Phase 1 but below it.
- These aren't novices; they are the most talented and skilled athletes in the country.
- Problem can be fixed.
- It starts with EDUCATION- parents, coaches, athletes.
- Build a community to support and invest in an honest, ethical process that's long-term, scientific, analytical and experientially based.
- This problem is bigger than all of us and it's affecting everybody, all stakeholders must come together for the long term good of the game.
- Best athletes in this country aren't playing baseball.
- Expenses, urban areas, boring? (Carlo's son chose lacrosse over baseball, kids get to run and be aggressive).
- Huge competitive opportunity for those willing to invest in a Long Term Athletic Development model (LTAD).

This leads me to...

### **Rick Riccobono- USA Baseball**

USA Baseball is thinking about the need for "grassroots" development. In fact they are developing a comprehensive document that outlines a Long-Term Athletic Development Model specifically for baseball.

- The plan will highlight what the developmental cycle or career arch of player should look like within the sport if they want to compete at an elite level.
- Baseball is an early introduction not early specialization sport; this is an extremely important concept to understand.
- Not only the "elite" athlete, everyone that loves the game has a role.
- Baseball for life; staying connected to the sport for health, fun and to grow and connect others to the game. Paying it forward through coaching, volunteering...
- People need to understand LTAD.
- USA Baseball overhauling talent acquisition and strength and conditioning processes.
- Two main reasons for above; keep the athletes they have healthy and ensure they are attracting the highest quality athlete possible.
- Current youth baseball culture in America "me-centric."
- Parents paying for high end experience, shapes expectations, "what's in it for me"...
- The players that make it the ones they want are humble and blue collar.
- Good things happen for kids like that!
- Multi-sport athletes are more durable, competitive, and mentally resilient and they aren't "used up."
- Intangibles, are established in a LTAD model.



Phil Loomis

### **Chris Walter- Detroit Tigers Strength and Conditioning Director**

I recently had the pleasure to spend an afternoon with Chris and two members of his staff at Comerica Park. Chris is in his second full season as the Director of Strength and Conditioning for the Tigers.

- The Tigers best players take care of the "fundamentals".
- The Fundamentals -
  1. **Core training** (not sit-ups and crunches).
  2. **Self Myofascial release** - Foam rolling, lacrosse balls, massage sticks.
  3. **Mobility** - combo of flexibility and body control/awareness (not just stretching, this is important to distinguish).
  4. **Deceleration** - can you control your body and put yourself into a position to re-accelerate. Best athletes have tremendous brakes!
  5. **Coordination** - the ability move fluidly with rhythm and timing.
  6. **Recovery** - getting quality sleep? Do you eat performance-promoting foods? Not supplements here but REAL food!
- The Tigers best overall athletes also happen to be their best players.
- Fundamental movements skills (FMS) and uncompensated range of motion is the foundation that must underlie sport specific skill.
- FMS skills dramatically increase the likelihood that sport specific skill will be optimized and they are a potent defense against over-use injuries.
- Performance testing is not a large priority always-think safety first.
- They don't spend much time on speed and agility, just don't have the time and it's best optimized during adolescence.

- Strength can always be addressed later when their bodies mature. Once that coordination and speed window closes though it's closed forever, can't get that missed time back.
- Coordination/FMS and Speed/Agility/Quickness must be emphasis during developmental years.
- Most people would be surprised how basic (not easy) the Tigers training programs are. You won't see them flipping tires or jumping on 50-60 inch boxes. To risky and doesn't help anyway.
- Exercises/programming can't be to easy, guys will get bored.
- Exercises/programming can't be to hard/complex because guys won't do it. They are baseball players not Cross-Fit wannabes or body-builders. They train to enhance on field performance and to stay healthy.
- Manual shoulder work- bands can be tricky especially with young athletes who lack good shoulder/cuff/scapular strength. Manual resistance provided by an experienced coach is an awesome arm care strategy.

### What's Next?

In the case of Carlo Alvarez of the Pirates and the Tigers Strength and Conditioning staff I also presented to them what I am doing with my Complete Baseball Performance (CBP) program. I wanted their honest assessment of the program.

I feel strongly that in order to expand and grow as professionals we need to challenge our comfort zones. While I am very confident in my education/experience it's still a little intimidating to have folks who are at the pinnacle of their industry audit what you're doing.

I was very reassured with their assessment that CBP is indeed a solid if not essential piece for the developing baseball athlete.

Contact Phil at: [Philloomis@yahoo.com](mailto:Philloomis@yahoo.com)

**Editorial Note:** Interpretation of the status of youth baseball comments by the individuals interviewed is that of the author and not Performance Conditioning Baseball/Softball.



PROFESSIONAL BASEBALL  
**STRENGTH &  
CONDITIONING**

**COACHES SOCIETY**

Presents

# Members' Forum

## Travel Nutrition for Baseball - To Build a Healthy Food Culture, Start with a P.L.A.N.

*Jacob Mertens, Team Dietitian, Iowa Cubs*

*Jacob is a Registered Dietitian and Certified Strength and Conditioning Specialist. He currently works for the Iowa Cubs as the team dietitian. Jacob started his career by graduating from Peru State College (NE) with a BS in Sports Management and Exercise Science. While at Peru State, Jacob was also part of the football team where he was voted a team captain, a four-year starter, two time Academic All-American, and All-Conference linebacker. Jacob then went on to receive his MS in Sports Science and Coach, while working as a Graduate Assistant Strength and Conditioning Coach for the University of Akron football team. After Akron, Jacob went home to attend the University of Nebraska and attained*

his credentials of Registered Dietitian. In total, Jacob has worked over 5 years as a collegiate strength and conditioning coach and nutritionist with working experience at the University of Idaho, University of Washington, Peru State College, Iowa State University, Monmouth University, University of Akron, University of Nebraska, University of Oregon, and the University of Alabama. During his career, Jacob has worked with athletes in a variety of sports including football, basketball, track, cross country, volleyball, soccer, crew, bowling, softball, baseball, field hockey, golf, and lacrosse.



Jacob Mertens

**T**he importance of nutrition is spreading throughout sports organizations to improve sports performance and extend an athletes career. A well-tuned diet can help reduce inflammation to recover from injuries or build muscle after workouts. On the other hand, a poor diet can cause dehydration, drop-in physical and mental performance, mood swings, and sleeping issues. Many of my athletes claim that their diet goes down during the season and is even worst during away trips. After a few consultations, I discovered that planning was the first step that needed to be addressed to improve my athlete’s diets. This P.L.A.N will go way past selecting a good pre and post-game menu, but to guiding the athletes with every food related decision.

It is estimated that an average American makes thirty-five thousand decisions each day, with two hundred being food and beverage related. The last thing on some athletes’ mind may be what they want to eat. It is up to the dietitian, or the strength coach in some organizations to help guide the athletes to better food choices. Every clubhouse will have the health conscious or “foodie” on the team, but it is safe to say that two thirds of the team will go towards convenient foods over seeking out the healthiest option. The take away point is to make your intervention as easy as possible and build it around a P.L.A.N. Using this guide will help you answer the questions need to improve the food culture of organization.

First of all, I build my P.L.A.N. off of these principles.

**Purchase**

- Your players will eat what is around them. Buy the healthiest option available and within your budget.

**Listen**

- Take time to learn what foods your players like. This will give you more respect to the players and allow you build better menus and guide them to picking healthier options.

**Assess**

- What does each day’s schedule look like? Answer the three W’s of when and where will they eat and who will prepare it.

**Nutrients**

- Build a food plan that has plenty of nutrients to help fuel and recover. Athletes “Eat & Train”, not “Diet & Exercise”

**Home Games**

Here are a few questions to answer to help build a home menu.

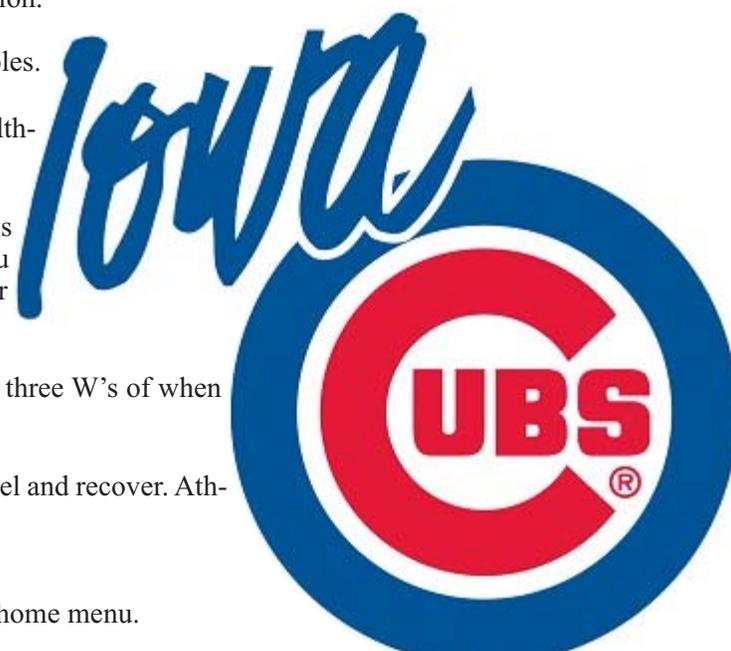
***Do you cater or cook meals in house for pre and post-game?***

Depending upon who prepares your meals will affect what you can offer, quality of the meal, and nutrient content. It is important to work with whomever makes your meals to select a menu and learn understand their capacities within the kitchen, both from an equipment and skill sense. You don’t want to choose an item if the kitchen doesn’t have the equipment to make the quantity you need or the staff to make what you request.

Making the pre and post-game meals in house has both advantages and disadvantages. The advantages you can control the purchase and quality of ingredients, meaning you can get more for your buck in quality and quantity. Good ingredients, make good items, which make a good menu. This is the same as good reps, make a good set, which makes for a good training session. You need to start from the ground up to make a menu or training session great.

When you have a catering company prepare your meals you lose some control. You can communicate with them to go over your guidelines and how you would like your meals to be prepared. Communication is very important with this to make sure you get the exact meal you order.

There are some great positives to catering meals. Your menu can expand and possibly improve on quality, due to them having a full kitchen to work with. Some caters specialize in one type of cuisine; Mexican, Italian, etc. This will also allow some of the international athletes to get a touch of home. Ordering food similar to what they get at home can also



help them psychologically and gain respect for you as a coach.

***What food options are close to the ballpark, where do your athletes often eat out, and what types of foods do they like the most?***

For meals away from the ballpark, pick 5 – 10 restaurants for them to choose from. Getting to know my athletes allowed me to select restaurants that they frequently order from and gave me the opportunity to introduce them to other healthy options. A popular coaching quote is “athletes won't care how much you know until they know how much you care.” This is also true in the nutritional world. By taking time to know my athletes, I could give them specific recommendations based on their food preferences. Doing this gave me more respect and trust from the athletes, making them more willing to go out of their nutritional comfort zone.

When I choose a restaurant, I print the menu and highlighting the best options. This strategy has help with compliance with athletes. I found that athletes ignored my suggestions when I give them a list food options. On the flip side, I had more athletes try my suggestions with the printed and highlighted menu. Within the menu, I do make further suggestions like asking for more vegetables on the side or a grilled meat instead of fried. Going over the menu and explaining why you selected these items is a great educational tool. This allowed my athlete to make wiser decisions at other restaurants moving forward.

***What time of day is the game?***

The time of game and following day’s schedule has some influence is what I like to set in the menu. Day game selections are much different than night games. For most our athletes, they want to get out of the clubhouse as soon as possible after a day game. A lot of time we will have a custom, boxed meal ready for them to grab and go. This meal can be lighter compared to some night games, as many of the athletes tend to get dinner a few hours after. Quick meals also work great on get away games.

**Traveling**

Here are a few questions to answer to help your team eat healthy during away trips.

***Are you traveling by bus or plane?***

When traveling, I like to have snacks available. This is much easier to do when taking a bus compared to flying. Below is a list of snacks that will past through airport security. I recommend foods that are higher in protein to help with satiety and to always pack an empty water bottle.

- Applesauce - unsweetened
- Bars (ex. RXBars, GoMacro, & Larabar)
- Cheese (ex. string or cubed)
- Dark chocolate - >75% cocoa (ex. Endangered Species, Lindt, & Pascha)
- Fresh fruit (ex. apples, banana, & oranges)
- Fresh vegetables (ex. carrots, celery, & snap peas)
- Granola
- Hard boiled eggs (pre-peeled)
- Individual nut/seed butter (ex. Justin’s, Wild Friends, & Artisana)
- Jerky – nitrite free (ex. Epic Bars, Nick’s Sticks, & Country Archer)
- Nuts, seeds, or trail mix
- Oatmeal packs
- Popcorn (ex. Skinny Pop, Smartfood’s Delight, & Angie’s Boom Chicka Pop)
- Protein powder (bring your own in a small container)
- Rice cakes
- Single serving spreads (ex. hummus & guacamole)



This is a great list to build off or bus travel. The benefit of a taking a bus is that it allows you to pack perishable items, beverages or larger containers. These items can also be used as snacks during the trip or as part of your performance nutrition. An example of this is taking along large bottles of tart cherry juice to aid in recovery.

- Coconut water
- Cottage cheese
- Deli meats – nitrite free
- Fresh fruit (berries, watermelon, & cantaloupe)
- Juice (tart cherry, beet juice, & ginger juice)
- Milk
- Sub sandwiches

- Water
- Yogurt

### ***What is your time of travel?***

If you have early morning travel, then there is typically no time for breakfast. Having higher calorie meals bars are an easy way for your athletes to have food on a bus or plane. If you are traveling via bus, some food options may be closed if you are traveling at night. You can have custom order sub sandwiches available to eliminate this headache.

### ***Will you have a layover or stops? If so, what food options are available at these stops?***

If you have a layover or planned stop, research the area for food options. The length of the layover will determine which establishments you choose, but it is best to always have a quick one in cases of delays. Pick a few sit down and fast food restaurants for each terminal as you may not know where your connecting flight will be. This will also give your athletes more than one option and prevent a backup in the kitchen. I look for restaurants that have a grill menu to build a plate around protein and vegetables.

You want to make the bus stops as short as possible. We pack sub sandwiches to eliminate the need to get food from a fast food restaurant. You can also get each person's custom order, which is a very easy, effective, and satisfying option. You may want to educate your athletes on how to shop for healthy foods at a rest stop, but a good plan will have any snack need during the trip.

### ***A few final thoughts on travel...***

In summary, long hours of travel can upset your digestive system. To minimize digestive issues, drink plenty of fluids and eat fiber-rich foods. I recommend six to eight ounces of water per hour of travel. Over pack fluids when taking a bus and recommend taking water bottles on flights. This is much cheaper than the price of airport bottled water. I also recommend getting your water bottle filled at a coffee shop, as they typically have a good water filtration system.



## **Away Games**

### ***What food options are available at your visiting city or town?***

Your nutrition plan will vary depending on the city or town you are in. Healthy options will be much easier to get at MLB and Triple-A cities compared to some towns at the lower levels. It is obviously important to have healthy food pre and post-game, but now you have the opportunity to help even more to determine healthy options outside of the ballpark.

Most likely your hotel will have a breakfast buffet or restaurant. You will want to inform your players of the healthy options. Athletes also appreciate if you are at the buffet to help build them a winning plate. You can also research restaurants within walking distance or a short Uber ride away to provide more variety. Most hotels can bring a refrigerator to your room upon request for the athletes to store these meals. Other delivery options can be Uber eats, Jason's deli, and Jimmy John's.

Seek out grocery stores so you can get any snacks or meals needed for the athletes during your stay. Many stores now have their own restaurants or meal areas to get a diversity of foods. I have had caterers short us on food or undercook protein, making me order more food that needs to be done in a limited time frame. Grocery stores or buffet restaurants are good to know in case of an emergency as they typically have enough food prepared at the time needed.

### ***What time is the game?***

Some hotels close their breakfast buffet before players are used to waking up. You can work with your hotel to extend the hours for your athletes or ask them to build a to-go box for the players to eat later. I also advise athletes to take items like fruit for a snack later on. Finding a couple places that are open late night can help a few athletes from making decisions like ordering pizza or going to a fast food restaurant.

### ***Does the away team have any partnerships with local restaurants or grocery stores?***

Some teams have corporate sponsorships with restaurants or other food companies that provide a discount with every order. This can be an easy way to get the best bang for your buck. It is important to ask the away organization which companies do a great job in that city. For me, this person is the away clubbie.

## **Final Thoughts**

Don't try to make everyone happy, because it will not happen. I tell my athletes if I can bat .500 when it comes to players liking the food then I did a good job. There have been trips when an athlete said it was the best food of the year and I would hear the exact opposite from another player.

My belief is that food should be fun and delicious. This means a meal might not be the healthiest option, but my

hope is that our athletes will pick the healthier options on occasion. These are high level athletes that need to perform daily. Getting calories in can be most important factor at times.

Make sure your athletes hydrate! The summer heat and travel can make it easy to be in a dehydrated state, which can lead to a decrease in performance. To monitor this, you can do hydration testing with sweat, specific gravity, or urine color. 

# Reading Research: The Relationship Between the Push Off Ground Reaction Force and Ball Speed in High School Baseball Pitchers

Oyama, Sakiko PhD, ATC; Myers, Joseph B. PhD, ATC

## Abstract

Baseball pitching is a sequential movement that requires transfer of momentum from the lower extremity to the throwing arm. Therefore, the ground reaction force (GRF) during push off is suggested to play a roll in production of ball speed. The purpose of this study was to investigate the correlation between GRF characteristics during push off and ball speed in high school baseball pitchers. A total of 52 pitchers performed fast pitches from an indoor pitching mound. A force plate embedded in an indoor mound was used to capture the push off GRF. The GRF characteristics (peak anterior, vertical, and resultant forces, vertical and resultant forces at the time of peak anterior GRF, and impulse produced by the anterior GRF) from the three fastest strike pitches from each pitcher were used for analyses. Spearman's rank correlation coefficients were used to describe the relationships between ball speed and the GRF characteristics. Ball speed was only weakly correlated with peak resultant force ( $[\rho]=.32, p=.02$ ), and vertical ( $[\rho]=.45, p<.001$ ) and resultant ( $[\rho]=.42, p=.002$ ) forces at the time of peak anterior force. The ball speed was not correlated with other variables. The correlation between ball speed and push off force in high school pitchers was weak, especially when compared to what was reported for adult pitchers in other studies. Unlike for adult pitchers, higher push off force is only weakly correlated with ball velocity in high school pitchers, which suggests that training to better utilize body momentum may help high school pitchers improve ball speed.

## PRACTICAL APPLICATION

We observed a statistically significant correlation between the ball speed and push off forces at the time of peak anterior force in high school aged pitchers. However, the correlations were weak at best, especially compared to what was reported for the collegiate pitchers, which suggests that high school pitchers are not able to utilize ground reaction force to generate ball velocity as effectively as more skilled pitchers. This indicates that incorporating training that facilitates transfer of momentum from the lower body to the throwing arm may help improve pitcher's performance. The transfer of momentum during pitching requires proper sequencing of pelvis and trunk motion, which would require strength and control of hip and abdominal musculature. Incorporating core strengthening exercises that improve hip and core stability and dynamic exercises that improves coordination of pelvis and trunk rotation may be recommended for high school pitchers. Such approach has been demonstrated to improve ball velocity in college baseball and softball players. 

Journal of Strength & Conditioning Research: [Post Acceptance: May 05, 2017](#)

# What Is Velocity Based Training?

Brett Longobucco

*Brett Longobucco joined the Castleton University strength and conditioning department in August 2016. He comes to Castleton after spending the summer as the head strength and conditioning coach for Canton High School in Canton, Conn.*

*Brett is a 2016 graduate of the University of Miami where he received his Master's Degree in Exercise Physiology - Strength and Conditioning. While at Miami, he was a graduate assistant with the Division I nationally-ranked men's and women's basketball, women's soccer, swim, tennis, and crew teams.*

*Brett attended Endicott College in Beverly, Mass., and completed an internship with the strength and conditioning department at Harvard University.*



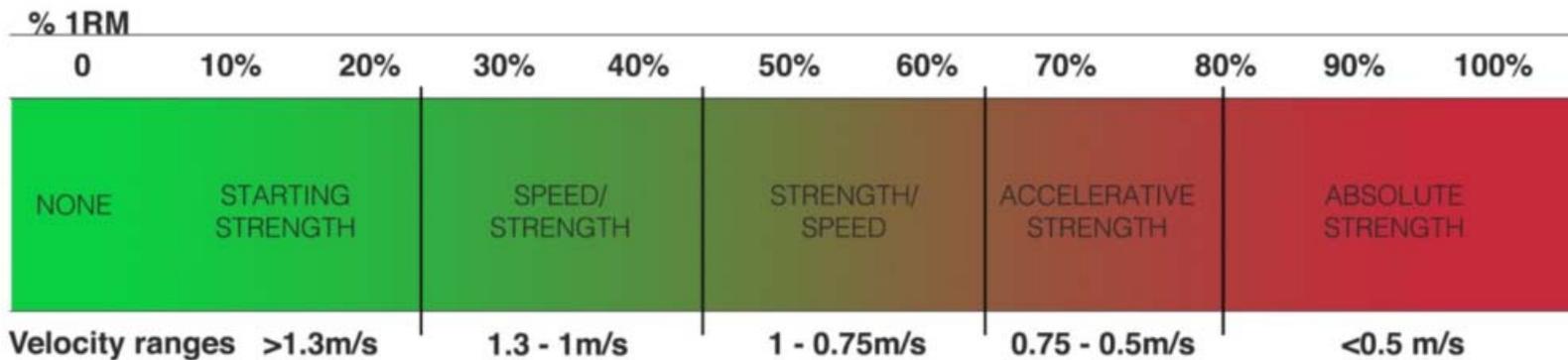
Brett Longobucco

INT  
ADV  
T6

Throughout the course of a season, in the months leading up to it, a student athlete needs and organized, disciplined, and structured strength and conditioning regimen, leading to the end goal of peak athletic performance and health come postseason. Volume and intensity, and the manipulation of each are the most important components of a strength and conditioning program. Over the past several years, Velocity Based Training (VBT) has been coming to the forefront as an innovative way to determine load for strength training. Velocity based training is a form of autoregulation training that uses the speed of the exercise to program the optimal weight for each set, in real-time. "Speed" in the context of the above definition can be more narrowly defined as the average concentric velocity (i.e. avg. meters/second of positive rep over each set). Up until recently only the high level of facilities would be seen at using this technology, which could cost thousands of dollars for one reading device. A lot has changed with technology in just the last half decade. Now the average lifter has access to the technology needed to do velocity based training, making it more commonly found now in mid to low budget strength and conditioning at facilities. While traditional 1 rep max (% 1RM) zones have long been used for making improvements in different traits such as strength and power, there are similar corresponding zones for making improvements in those same traits with velocities.



## VELOCITY ZONES



So what does this all mean? In simple terms, focusing on trying to move the bar at a certain velocity instead of trying to use a certain weight is a great way to increase the effectiveness of your workouts. This helps you more accurately find an exact workload for that given day. In an environment with stressors around every corner, it is crucial for development to identify when those fluctuations happen and accommodate, rather than failing a lift due to intensity, or overtraining the targeted intensity level. Here is an example: if you had 80 percent of the 1RM listed for that day, the actual relative load may be 98% due to a lack of sleep the night before and a skimpy breakfast, which would be too heavy for that day. It could also range as light as 62 percent of a great day where sleep was spot on. This is why athletes can feel strong some days and weaker on others. The absolute load is not the same as the relative intensity that we had pre-selected. By utilizing Velocity based training, we can set a speed appropriate for the adaptations being desired and the student athlete stays in that target speed regardless of actual number on the bar. This can have a huge impact on decreasing stress over a long period of time. Focusing on speed rather than weight allows athletes less volume during the demanding weeks of season yet still being able to make requisite strength gains due to the speed of the movement under any kind of loading. In my opinion, there is no bad time to use velocity based training, both in season and during non-traditional season. At the end of the day, almost every single sport is performed at speed. Explosive, violent movements often win or lose games. Moving at high speeds with a low volume can minimize wear on the body during the crucial times of the year. Contrary, in the off-season, a slower velocity zone may be desired, meaning the load needed to be moved would be heavier. The table below is a good place to start for

velocity based training and recognizing which adaptations take place in which speeds. As always, athletes safety is first and foremost. This is an advanced training technique that is only recommended when athletes possess the skills and capabilities to safely perform these movements at speed. 

Trait	Mean Velocity	Approx % 1RM	Approx Rep Range
Absolute strength	<0.35 m/s	90-100%	1-2
Circa max strength	0.35 - 0.5 m/s	80-90%	2-4
Accelerative strength (hypertrophy)	0.5 - 0.75 m/s	65-80%	5-15
Strength-speed	0.75 - 1 m/s	45-65%	3-8
Speed-strength	1 - 1.3 m/s	25-45%	3-8
Starting strength	>1.3 m/s	<25%	3-8

# Library LINKS = From the "Fit"-to-a-T" 7-T System of Program Design Library

## **T-1** Training Age

*Training Age – How to Determine It*

**Learn:**

**Step 1**

Training age is a difficult thing to define. Our approach is to do an initial evaluation on the athlete. We look at the following areas:

- shoulder range of motion
- shoulder strength

- core/trunk range of motion (flexion, side flexion, extension and rotation)
- core strength
- glute medius strength (1- leg stance and control)
- hamstring flexibility
- knee flexion/extension
- hip internal and external rotation

## Step 2

Armed with this information, we take into consideration:

- the athlete's age
- their past history in working with strength and conditioning
- past injury history
- growth in the past year

## Presented:

### Basic Workout

Exercises are done for two sets and can be done as super sets (doing on exercise one set and a different exercise the next set) or in circuit training fashion. The program is started two days after the initial evaluation. We ask the athlete if they are sore after the first workout. We try to determine how sore and where. This is a total body workout so we want to make sure soreness is equal on both sides of the body. The idea is to get feedback from this workout.

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## 1 Training Age

*Understanding and Preventing Age-Specific Injury in the Young Baseball/Softball Athlete*, Bruce Morgan

## Learn:

As it pertains to athletic injury teens and preteens should not be thought of as merely smaller versions of ourselves. Owing to their unique skeletal anatomy children are vulnerable to a litany of injuries which are common and often completely unique to their population. Because early recognition is the key to successful management and ultimately resolution of a given condition, being mindful of the signs and symptoms that warn of these injuries will, it is hoped, decrease the delay in accessing health care, and as a result, decrease the pain and disability these injuries can cause.

## Presented:

### Osgood-Schlatter's Disease

A frequent site for this bony irritation is the tibial tuberosity. This anatomic structure is the site of attachment for the tendon (patellar) of the quadriceps. In the child this bony bump or prominence (situated just below the knee) is not fully fused to the shin or tibia. As a consequence, when subjected to the stresses common to jumping and running, the tuberosity may become swollen and in some cases exquisitely tender to touch. Known in medical parlance as Osgood-Schlatter's disease those who suffer its affects (commonly girls 12-13 and boys 13-15 years of age) typically report pain with jumping, squatting, kicking and other activities which require the forceful contraction of the knee extensors (quadriceps).

### Sever's Disease

The repetitive and often aggressive weight bearing associated with athletic participation (particularly while wearing a cleated shoe) is that which sets this disease process into motion; once active Sever's is capable of making even a casual stroll a painful experience. Heel cups or padded insoles have been shown to be of benefit in tamping down the pain brought on by this condition, however, some period of rest may ultimately be required.

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## 6 Total Workload

*The Baseball Conditioning Base – Young Baseball/Softball Athlete*, Chris Cecere



**Learn:**

Our training philosophy is a multi-tier approach. Educating the athletes is one of the program's main focuses. I want all my athletes to move in correct patterns and learn why they must be in the most optimal positions. The most important part of any strength program is keeping them healthy and on the field. If your athletes are always injured, then your program is not effective. The number one principle in our program is that we evaluate at all times. We concentrate on creating a "base" for every athlete that we come in contact with. We deal with such a wide variety of ages, both training and chronological. Some have lifted for years and you may have to retrain some of their movements; others may have never stepped foot in a weight room.

**Presented:**

**Basic Weight Room Movements**

The basic movements we teach are the squats, lunges, Olympic lifts and proper landing while performing jumps during plyometrics exercises.

**Applying the Base to Shifting Populations in Baseball**

In our philosophy statement, I pointed out how this base shifts from athlete to athlete who range in age from 16 to 35 years old. Some never lifted in high school, others are from overseas, some were in different organizations and still others are at the end or peak of their careers.

**Individualizing the Base Program**

A strength coach must first look at an athlete to determine what, if anything, is problematic. The lifts are the same, but the pace at which the athlete excels varies greatly. If an athlete is proficient at squats, we can move to squat jumps and then on to plyometrics or Olympic movements.

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*Getting Back Baseball Legs – the Transition from Off-Season Training, Joe Kessler*

**Learn:**

We have a basic philosophy, to create an environment of movement efficiency by addressing movement pattern deficiency. This all starts in spring training. We want to get the player's baseball legs underneath him. It is a priority while "re-integrating" strength and conditioning into their daily routine.

**Presented:**

**Coming From Off-Season Training**

When players arrive in the spring they came from an off-season of heavy and extensive training. The volume of strength and conditioning work must compliment their baseball work until they can reorient themselves to the routine of baseball or get their baseball legs back under them.

Program considerations—the all-important first ten days

We treat position players different than pitchers. This is especially true in the first ten days. We get the jump on pitchers and catchers because they report earlier.

**The Role of Good Communications and Asking Questions**

We work closely with our training staff during this process. When a player has general soreness or fatigue, it becomes a discussion. It is a planned process not only with trainers. but also with position coaches and baseball staff.

**Working it into Baseball**

It is important and we are fortunate in the fact that we work closely with the position player baseball staff in this process. We are always very aware of managing fatigue as a strength and conditioning staff.

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*Applying Basis Strength and Conditioning Principles to a League Professional Baseball, Dax Fiore*

**Learn:**

Based on my strength and conditioning principles I start with a focused attack on building the player from the inside out. I believe that building a strong and stable core is essential in a sport where a large amount of success is based on rotational force that can be created and decelerated in a safe and repetitive manner. Based on this belief I aim to train the Core up 5-6 days a week in some manner be it an endurance, plyometric, strength, or flexibility movement. Usually it's a combination of all four.

**Presented:**

**Bring It Together—Teaching and Motivating**

Since Baseball is a global game and players arrive with many different conditioning backgrounds. It is essential from an organizational standpoint that we get everyone on the same page with our conditioning program and its approach to player development.

**Building-Ground Up- Inside Out**

My team this year will play 141 games in 150 days. This is in addition to batting practice, infield-outfield work, bull-pens sessions, base running drills, the preventative maintenance they do in the training room and their strength and conditioning program.

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*Off Season Throwing Program for Pitchers: Three Questions Answered, Alan Jaeger*

**Learn:**

As we know pitching is an art form based on science that requires a unique approach for each pitcher. Everyone's response to training is different. Their history is different. That said, there are three main questions a coach has to consider when establishing an off-season throwing program whose goal is to get the pitcher ready for the start of the season. Here are the questions:

- 1) What is the amount of rest a pitcher needs to take after a long season?
- 2) What should the pitcher do during the off-season?
- 3) When and how does the pitcher transition their off season throwing program into their season?

**Presented:**

**Phase 1:** Stretching Out

**Phase 2:** Stretching Out & Pulling Down

**Phase 3:** Deepening The Base: Building Strength and Endurance

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