THE EFFECTS OF VARIED WEIGHTED IMPLEMENTS ON THE KINEMATICS OF THE SHOT PUT pdf

1: Weighted Baseball Training - A Getting Started Guide

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After 6 weeks of throwing under- and overweight baseballs, the weighted ball training group saw a significant increase in throwing velocity compared to the non-weighted ball throwing group. More Specifically the weighted ball throwing group saw an average increase of 4. This data is consistent with previous weighted ball research studies. These results are similar to those that were found in this study. After a 6 week period while throwing both over- and underweighted baseballs, the over- and underweighted ball subjects from this study saw approximately a 5. The percentage increases from the two studies are very similar, but it needs to be taken into account that the testing methods between the two studies were different. Further research needs to be conducted to determine the relationship between pitching velocity and turn and burn velocity. The velocity increase observed for the weighted ball group is typical when compared to past studies. What also needs to be taken into account is the focus on throwing the balls with efficient throwing mechanics during the 6 weeks. This program was designed with a series of drills that put the body in different positions that are similar to different points in the pitching motion. Throwing the ball efficiently will not only aid in the increase in ball velocity, but will also decrease in the amount stress put on the throwing arm. Pitching a baseball has a lot of moving parts before the release of the baseball from the hand as mentioned by Werner et al It is important to think of the pitching delivery as chain of events that start at the feet and end with the throwing of the baseball with considerable force toward a target sixty feet six inches away. This amount of force puts a considerable amount of stress on the throwing shoulder and elbow. It must also be taken into consideration that during this study the pitchers were being coached on throwing the ball with proper mechanics while throwing over- and underweighted baseballs. All previous studies that have looked at pitching mechanics and their effect on throwing velocity have been done using regulation baseballs. Further research needs to be completed on the kinematic changes of throwing over- and underweighted baseballs. In conclusion, oftentimes coaches find it difficult to develop programs that both increase pitching velocity while also decreasing stress being put on the throwing arm. Developing efficient mechanics both aid in increasing velocity and decreasing stress on the throwing arm. The addition of throwing under- and overweight baseballs with the specific drills from the 6 week program, not only create more arm strength and speed, but also teach the body how to throw a baseball efficiently. Because of NCAA regulations the last two weeks of this study were not monitored by a coach. Athletes were required complete the last five sessions independently and the final testing day was then monitored. Future studies should focus on the kinematic changes that may occur to the pitching motion while throwing weighted baseballs to determine if there is any additional stress placed upon the throwing arm when throwing under- and overweight baseballs. This study was also completed during the fall non-traditional season of NCAA division III pitchers, future research should include the effects of over- and underweighted baseball training during the season. Glenohumeral range of motion and lower extremity flexibility in collegiate-level baseball players. Sports Health, 4 1 , Essentials of strength training and conditioning. Clearing up the rotator cuff controversy. Effects of under-and overweighted implement training on pitching velocity. Effects of general, special, and specific resistance training on throwing velocity in baseball: Journal of Strength and Conditioning Research, 15 1 , Effects of baseball weighted implement training: Strength and Conditioning Journal, 31 2 , Effects of throwing overweight and underweight baseballs on throwing velocity and accuracy. Sports Med, 29 4 , Glenohumeral range of motion in major league pitchers: Sports Health, 3 1 , Effect on throwing velocity and accuracy. Athletic J, 53, Baseball throwing speed and base running speed: The effects of ballistic resistance training. Journal of Strength and Conditioning Research, 12 4 , A comparison of medicine ball training and weight training. Journal of Strength and Conditioning Research, 8 3 , The effect of isotonic weight training programs on the development of bat swinging, throwing, and running ability of college baseball players. Relationships between ball velocity and throwing mechanics in collegiate baseball pitchers. Journal of Shoulder and Elbow Surgery, 17 6 ,

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2: Biomechanics of Ice Hockey Slap Shots: Which Stick Is Best? â€“ The Sport Journal

The purpose of this study was to investigate the effects of different warm-up (WU) devices on bat swing parameters including maximal resultant velocity (MRV), resultant velocity at ball contact.

Biomechanics of Ice Hockey Slap Shots: Which Stick Is Best? This literature review on both slap shot biomechanics and technological developments in ice hockey sticks suggests that player technique and strength exert much greater influence on slap shot puck velocity than does stick composition. Moreover, this study illuminates how stick flexibility, rather than composition, should be the key mechanical consideration in stick selection, since highly flexible sticks can enhance both stick deflection and strain energy storage, two important variables in the velocity of slap shots. At its historical core, hockey is a game rooted in the natural environment. First played on the frozen lakes and rivers of upper North America, ice hockeyâ€”begun as the Native American game of shinnyâ€—featured carved wooden poles as sticks and hand-sewn fabrics as balls Oxendine, Now, however, burgeoning technologies are virtually recreating hockey sticks with each passing day. Wood sticks, once the paragon of the sport, have largely been replaced by high-techâ€—and high-pricedâ€—graphite and composite models. Certainly, the need for scholarly research on hockey technology has never been greater: Thousands of participants in the sport stand to benefit from a deeper understanding of the new developments in hockey stick technology. This paper, then, provides a scholarly education on hockey sticks, both by analyzing the biomechanics of ice hockey shooting and by investigating the extant literature on hockey stick research. In particular, this essay explores the implications of stick technologies and biomechanics for the hockey slap shot, presenting the stick selections and key bodily mechanics that stand to enhance performance of this complex and critical hockey skill. Of these, several studies have analyzed the mechanics involved in various types of hockey shots, including the wrist, snap, slap, and backhand shots, performed both while stationary and when skating Carr, , p. The slap shot in particular has garnered much scholarly attention, with researchers dividing the shot into six distinct phases: Three of the sixâ€—the preloading, loading, and release phasesâ€—concern the mechanical behaviors exhibited by the stick after its contact with the ice surface. This blade-ice contact time has been the intense focus of the majority of researchers investigating the hockey slap shot. Blade Orientation Past studies have uncovered several key differences between elite and novice performers of this critical blade-ice contact portion of the slap shot. For example, researchers have cited the orientation of the stick blade during its contact with the ice as an element differentiating elite from recreational performers. In addition, Lomond et al. The Lomond et al. Hand Position In addition, researchers have cited player hand position as a distinguishing factor in expert slap shot performance. Wu and colleagues, studying male and female collegiate hockey players, noted that a lowered bottom hand, even past the midpoint of the shaft, generated additional stick bend and thus more strain energy, resulting in greater puck velocities Wu et al. Thus, while it remains unquantified for now, some contribution to force generation in the hockey slap shot seems to result from a low bottom-hand grip on the stick, even past the shaft midpoint. Impulse Duration Beyond blade orientation and hand position, two additional factors likely play considerable roles in determining slap shot velocity. The first of these significant contributors is impulse duration, or the force applied to an object over time, the elongation of which increases the transfer of force to an object Carr, , p. Further, Villasenor, Turcotte, and Pearsall found that among to year-old male slap shot performers, both expert and recreational, the longer the blade contacted the puck, the greater the final puck velocity. Moreover, all elite players in the study demonstrated longer blade-puck contact time than their nonelite counterparts an average 38 ms for elite players vs. In exploring the stick-bending phenomenon, Villasenor et al. Expert players also spent a greater percentage Overall, Villasenor et al. Alongside blade orientation, hand position, and impulse duration, stick bending contributes to the multiplicity of mechanical factors generated by the player during the performance of this most forceful of hockey skills. With the onslaught of new hockey technologies over the past decade, no shortage of stick options exists. Whereas hockey sticks were once constructed almost exclusively out of Rock elm, then in the s from aluminum for the shaft and wood for the blade, 21st-century trends now incorporate space-age composite materials like graphite, Kevlar, and carbon in hockey stick design Sports Materials, ; Hache, ; Marino, ; Pearsall et al. The remainder of this paper explores mechanical differences that can be discerned among these construction types during the performance of hockey slap shots. Indeed, the current revolutions in hockey stick materials are efforts to capitalize on this mechanical principle. Several scholars have recently studied the effect of hockey stick composition on slap shot velocities, yielding intriguing and somewhat unexpected results. In a study of wood, graphite, and aluminum stick constructions and their role in slap shot velocity, for instance, Wu et al. Similarly, in an experiment with identical models of wood sticks with laminate shafts, Villasenor et al. To date, then, and contrary to much conventional belief, scholars have not linked any particular stick material to increased slap shot velocity. In fact, several slap shot studies involving both wood and composite sticks demonstrate the influence of stick flexibility on shooting velocity. With this conclusion, Worobets et al. In a related investigation, Pearsall et al. Overall, then, the findings of Worobets et al. If any characteristic of a stick deserves to be considered for its effect on the slap shot, then, it appears to be stick flexibility, not stick composition. Improved Slap Shot Performance This review suggests that both player techniques and stick characteristics are important to slap shot success. In addition, expert shooters contacted the ice roughly 1 foot behind the puck to initiate stick bending at or before first contact with the puckâ€”a crucial factor in maximizing shot velocity. Clearly, hockey coaches and players stand to adjust a variety of technical details to hone their technique and positively influence their level of success in the slap shot. Across studies of players from youths to professionals and of sticks from wood to composite, stiff to flexible, the preeminence of player influence on achieved slap shot speeds rings consistently true and thus deserves to be the primary focus of performance-driven hockey coaches and players alike. That said, this review has uncovered several findings relating to hockey sticks themselves. First, current research does not clearly demonstrate any advantage for one particular stick composition wood, aluminum, or composite over others. Instead, scholarly findings point to stick flexibility as the key mechanical consideration in stick selection. Several investigations attest to the mechanical benefitsâ€”most notably in stick deflection and strain energy storageâ€—achieved with highly flexible sticks. It would seem sensible for coaches to advise hockey players to use the most flexible sticks possible without incurring constant breakage to maximize shooting velocity. This recommendation seems particularly apt for younger, less powerful players who may generate more stick bending with less applied force. Research suggests, then, that attention to hockey stick flexibility over any particular stick material may best aid players in heightening slap shot speeds. While shooting remains only one of a multitude of hockey stick tasksâ€”including the precision skills of stickhandling, passing, and receivingâ€—players nevertheless stand to positively affect slap shot performance by supplementing the principal concerns of player technique and bodily strength with the use of flexible hockey sticks. Dynamic performance characterization of hockey sticks and golf clubs using a combined vibrational energy level and modal analysis approach. Unpublished doctoral dissertation, University of Mississippi. Biomechanics powers ice hockey performance. BioMechanics 11 9 , 1â€”7. Retrieved March 29, , from http: Sport mechanics for coaches 2nd ed. Performance-determining factors in speed skating. Dynamometric analysis of different hockey shots. The biomechanics of hockey shots. Canadian Amateur Hockey Association. The physics of hockey. Johns Hopkins University Press. Haptic perception of affordances of a sport implement: Three-dimensional analysis of blade contact in an ice hockey slap shot, in relation to player skill. Sports Engineering, 10 2 , 87â€" An EMG analysis of the validity of using weighted hockey sticks for specific overload training. Biomechanical investigations of performance characteristics of various types of ice hockey sticks. International Society of Biomechanics in Sports. Retrieved March 30, , from http: American Indian sports heritage. The influence of stick stiffness on the performance of ice hockey slap shots. Sports Engineering, 2 1 , 3â€" Biomechanics of ice hockey. Lippincott, Williams, and Wilkins. Kinematics of the slap shot in ice hockey as executed by players of different age classifications. Here is a sampling of some of the materials that enable players to move faster, hit the ball farther, pedal longer, and be better protected. Advanced Materials and Processes 10 , Recoil effect of the ice hockey stick during a slap shot. Journal of Applied Biomechanics, 22 5 , â€" The influence of shaft stiffness on potential energy and puck speed during wrist and slap shots in ice hockey. Sports Engineering, 9 4 , â€" The performance of the ice hockey slap and wrist shots: The effects of stick construction and player skill. Sports Engineering, 6 1 , 31â€" Author Note David J. The author thanks Dr. Douglas Goar of the United States Sports Academy for his encouragement and insight regarding this essay. 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3: Sport Mechanics for Coaches, Third Edition: Basic principles for understanding sport mechanics

the effects of various weighted implements on baseball swing kinematics in collegiate baseball players charles c. williams,1 jacob r. gdovin,2 samuel j. wilson,1 vanessa l. cazas-moreno,1 john d.

The Most effective Bat Speed Tool on the market! Looking for drills to improve bat speed? But what happens if a player already has sound mechanics? The drills will fail to improve bat speed and it will be time spent practicing with nothing to show. Just grab the bat and swing it. The weight of the bat combined with a program that regulates training volume will do the rest. Players, regardless of level and mechanical efficiency, can see results. Unfortunately, the concept still remained a mystery to the majority of the general public until recent years. These countries took great pride in their athletic accomplishments and poured millions of dollars in research into more efficient ways to build better athletes. After experimenting with their Olympic throwers shot put, javelin, hammer, and discuss , they discovered that by increasing or decreasing the resistance of the projectiles that were thrown in practice, they could produce significant gains in throwing distance and velocity with objects of regulation weight. By using too much or too little resistance you will be putting in a lot of effort and time to make yourself better, but it is actually time and effort wasted. This again goes back to the fact that timing and bio-mechanics are essential to sports which require a high technical component. That means in order to accommodate for the additional or reduced load, the athletes would change their movement pattern--which means, in baseball terms, they would change the way they swing or throw, making the training essentially useless. The phrase "practice makes perfect" is often used by coaches, but in reality only perfect practice makes perfect. That means someone wishing to increase his bat speed must take each practice swing with perfect technique at game speed in order to have the hope of making noticeable improvements. To become fast and explosive, you must train to be fast and explosive. Quality always wins over quantity. A quick example would be looking at a marathon runner vs. A marathon runner runs for miles at a time in training. A sprinter runs a few short sprints. They are both running but the differences lie in a intensity, b volume of training, and c rest intervals. Changing those 3 variables makes the outcome of the training drastically different. The take- home message is: If you want to increase your bat speed, you have to practice swinging as fast as possible with perfect mechanics. Once we had an idea of where to start in regards to percentages with the overload-underload, we began experimenting with players of different ages and ability levels. The goal was to find the ideal percentage to weigh the bat in order to get optimal performance increases improved bat speed. Elite sprinters and swimmers have been effectively using a form of Overload Underload training to blow away world records. The sprinters and swimmers attach themselves to cords that either provide resistance from behind or a slight tow from in front of them to create a pace that is slightly slower or slightly faster than their personal best. Many throwers from track and field continue to use the Overload Underload concept with great results. Even baseball, which has a history of lagging behind the times in improving sports performance through science, is beginning to catch on. Many pitchers have been using Overload Underload training to drastically improve their throwing velocity as well as strengthen their arms for the wear and tear of a professional season. The majority of Overload Underload training research has been done with throwing a baseball. The research has all come back with stellar results. Not only did the players participating in the program make significant gains in velocity, but they also stayed healthy for the following season, a difficult accomplishment considering the stress that throwing a baseball puts on the muscles, tendons, and ligaments of the arm. Overload Underload training is simply one of the simplest and most effective ways to make significant performance improvements in a short amount of time. Here is a list of pertinent literature pertaining to Overload Underload training and its effectiveness on increasing performance. Note - the vast majority of these studies deal with training for improved bat speed or throwing velocity through the use of overload, underload, or a combination of overload and underload techniques. This is by no means an exhaustive list; there are many more studies out there relating to Overload Underload training. Coop

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DeRenne, Barton P. Hetzler and Kwok W. The Journal of Strength and Conditioning Research: Strength and Conditioning Journal: Indiana University, Bloomington, IN, Effects of overload training on velocity and accuracy of throwing. Does it improve bat velocity? Strength Cond J DeRenne C and Branco D. Overload or underload in your on-deck preparation? Effects of under- and overweighted implement training on pitching velocity. J Strength Cond Res 8: Effects of weighted bat implement training on bat swing velocity. J Strength Cond Res 9: Effects of weighted implement training on throwing velocity. J Appl Sports Sci Res 4: Effects of warm-up with various weighted implements on baseball bat swing velocity. J Appl Sports Sci Res 6: DeRenne C and Okasaki E. Increasing bat velocity Part 2. Acquisition of throwing skill involving projectiles of varying weight. Springfield College, Springfield, MA, Kinematics and kinetics of youth baseball pitching with standard and lightweight balls. Varied resistance in power development. Mod Athlete Coach Sergo C and Boatwright D. Training methods using various weighted bats and the effects on bat velocity. J Strength Cond Res 7: Southard D and Groomer L. Warm-up with baseball bats of varying moments of inertia: Effect on bat velocity and swing pattern. Res Q Exerc Sport Contributing factors for increased bat swing velocity: Effect of overload warm-up on the velocity and accuracy of throwing. Use of different weight to develop specialized speed-strength. Sov Sports Rev If you are interested in finding out more about the scientific studies on overload underload training, a simple search at http: To obtain the full study not just the abstract you might have to go to a local library. Overload Underload training works. I point this out because oftentimes people will make extraordinary claims about products or ideas being the next miracle cure.

THE EFFECTS OF VARIED WEIGHTED IMPLEMENTS ON THE KINEMATICS OF THE SHOT PUT pdf

4: Effects of baseball Weighted Implement Training by MLB Pitching - Issuu

Alternative Shot Put Techniques for Beginner Throwers. And. Use of Varied Weight Implements in Training Throwers. 1. Philosophically I believe high school track & field is a sport that can have a place for.

Each of these phases can last a difficult task requiring strength and between 1 and 3 months. Specificity of During the baseball precompetitive INTRODUCTION training infers that there is a positive phase, strength and conditioning here are numerous general, transfer of training effect when re- coaches should emphasize the devel- T special, and specific annual re- sistance training programs de- signed by high school, college, and sistance training exercises are close to or identical to the sport skillâ€"specific range of motion ROM 2. A unique training protocol increasing athletic performance and acceleration and deceleration move- to enhance throwing and hitting decreasing the risk of injuries ments. Unauthorized reproduction of this article is prohibited. The longer before deciding whether or not movement patterns 8,12, Most Soviets modified their field event to swing at a pitched ball. This could recently, Fleisig et al. These weighted games, and at the professional level, ities of youth pitchers when training implements were used specifically allow a player to have a potentially with a light 4 oz baseball. This in their specialized speed strength long and prosperous career. Table 1 summa- speeds with less muscle force gener- formances in youth, high school, and rizes the results of these studies. On the other collegiate baseball players. Addition- The neurophysiological mechanism hand, the reason for using over- ally, this article suggests practical for increasing movement velocity re- weighted training for these athletes applications on how and when to sulting from the weighted implement was that body segments would move apply these findings. The Soviet collegiate players. Research findings fast-twitch muscle fibers 36,38, From to fied standard competitive implements Exercise researchers in the United , Andrews operated on the elbows baseballs and bats while safely dupli- States have demonstrated that throw- of pitchers, including high cating the acceleration and decelera- ing velocity of a standard 5 oz baseball school pitchers Although these tion arm and bat movements full ROM could be increased significantly by data are only from 1 sports medicine at or near game speeds. Pitchers and throwing heavier baseballs 7â€"17 oz center in the United States, they hitters exercise according to a specific 1,3,20,21, There are also data that detail 24,42 , and one 24 has suggested that using light and heavy bats signifi- baseball throwing arm injuries from the their program may reduce throwing cantly increased bat swing velocities mids to 6,18,23,25,31â€" Thus, baseball Conte et al. The investigators suggested WARM-UP strength coaches, reported no coach that pitching with lighter baseballs may Researchers have reported that sport- using any weighted implement throw- also reduce the risk of overuse injury in specific resistance warm-up increases ing protocols, yet throwing-related youth pitchers and also help develop performances in explosive activities injuries have been on the rise at the arm speed Assuming, that also reported no related throwing 35, In general, all Swing Fan, and power tubes and throwing arm injuries 3,12,14,20,21, warm-up and training hitting studies sleeves. Swing Fan, and power tubes and deck circle. As strength and condition- bat for overload resistance. As with the warming-up with 2 heavy-weighted ing coaches review these 3 training throwing weighted implement training bats of 34 and 56 oz, respectively, studies and plan their precompetitive research, strength and conditioning moment of inertia significantly in- power training phase while working coaches should be familiar with the creased, whereas bat swing velocity with their hitting coaches, they should research on bat swing velocity that has significantly decreased. Once educated, an overloaded bat because they were weighted bat studies 17,37 indicated strength and conditioning coaches either 1. DeRenne hitting coaches and players their bat reported by DeRenne and col- and Okasaki 17 reported a significant warm-up protocol versus traditional leagues 7,11, Southard and increase in bat swing velocity with 10 on-deck warm-ups, which have re- sulted in decreased bat velocities Groomer 39 concluded that baseball ex-college and professional baseball 7,11,15,35, Table 2 displays the not to swing a heavy bat in the on-deck resistance power swing device. In results of these studies. Each of these circle because it produced the slowest another overweighted bat study, Sergo warm-up studies used weighted bats bat swing velocities. These results and and Boatwright 37 conducted a 6- before the swinging a standard 30 oz conclusions support, in part, the find- week bat training study with collegiate bat 7,11,15,35, The inves- oz , the Power Sleeve 4 oz , 6 heavy weight 30 oz before game competition. In addition, the underweighted bat swing velocity by 8. It was noted by DeRenne bats in these studies weighed 9. The results of 4 et al. Each of these game bats used in the s weighed game bat weight 30 oz. In addition, studies used different training protocols 29â€"30 oz 4. Additionally, the inves- DeRenne and colleagues 7,11,15 and and durations, which are shown in tigators 37 reported that there were Southard and Groomer 39 concluded Table 3. These studies can be grouped no significant differences between that the very heavy commercial donut in 2 categories: Therefore, the control subjects that swinging a light 9. Strength and Conditioning Journal www. In the study by 2 under- and overweighted integral weighted bats. In each study, the DeRenne et al. Table 3 Effects of over- and underweighted bat training on bat velocity No. The investigators 37 concluded performances. These unique training weeks. There was a 2: The investiga- indicate that swinging-specific over- majority of exercise research and tors 13 suggested that there is weighted or underweighted bats with throwing injuryâ€"related information a possible transfer of training effect a precise training protocol swinging available. Furthermore, they may not when the elements of the supplemen- â€" times a week for 6â€"12 weeks be biased or swayed by past baseball tary and overloading exercises e. A future topic for baseball of the primary activity baseball skills. In addition, research would be to examine in- Again, weighted bat implement train- though Sergo and Boatwright 37 season baseball weighted implement ing consisted of exercising with mod- reported that any bat swung times training to see how it affects baseball ified standard competitive bats while a week for 6 weeks would increase bat performance. Baseball weighted implement training It is important that strength and In addition, Sergo and Boatwright 37 is a unique but essential training pro- conditioning coaches know that when reported that all 3 research groups, tocol that is research based, injury free, working with pitchers and pitching including the control group, improved and, most important, enhances youth, coaches, they should be cautious if bat swing velocity between 8. Sports program that is not research based. It and conditioning coaches should also Rev I: Theory and players because the outcome of these coaches an in-season warm-up pro- Methodology of Training 4th ed. Strength and tocol for each game. Am weighted implement training protocol duct any weighted implement training J Sports Med Finally, be- cause there have been no known 8. These results have already Athletic J Implement weight training itive high school and collegiate pitches programs. Strength Cond J 9: Does it improve During the precompetitive training bat velocity? Strength Cond J DeRenne C and Branco D. Overload or safe and positive training effects for to how they could include hitting underload in your on-deck preparation? First, they could have players Effects of under- and of DeRenne et al. J Strength Cond Res 8: Second, strength and condition- University of Effects of weighted bat implement ing coaches could work with the training on bat swing velocity. J Strength hitting coach to implement and mon- Cond Res 9: J Appl Sports Sci Res should be noted that if strength and 4: Effects of warm-up with various their own by adding golf club swing an assistant pro- weighted implements on baseball bat lead tape to the sweet spot of a baseball fessor and the swing velocity. J Appl Sports Sci Res 6: This should protect the lead tape and conditioning J Strength Cond Res DeRenne C and Okasaki E. Increasing bat supply store or online. The Effects of Graded Typically 2 inches of lead tape and Simulative Isometric Exercise on Strength and conditioning practices of is equivalent to 1 oz of weight. Indiana University, Bloomington, conditioning coaches. J Strength Cond IN, Improving vertical jump Muscle fiber specific strength training: Biochemistry J Strength Cond Res Human creased bat velocities during the of throwing. Med Sci Sports Sci Acquisition of throwing skill involving â€", Contributing factors for increased bat projectiles of varying weight. J Strength â€", The effects of different warm- Cond Res February 27, [epub Ahead up conditions on normal baseball bat of Print]. Van Den Tillaar R. Influence of exercise and training A brief review. Exerc Sport Sci â€", Power output of fast and slow fibers from human skeleton muscle. Human Muscle Rev Sergo C and Boatwright D. Training and Hagerman R.

5: Bat Speed Drills - Bat Speed Training - How to Improve Bat Speed

The over- To date, there are only 5 research weighted implements were a weighted using a bat with a larger moment of studies investigating the effects of wooden bat of 34 oz, which was 12% inertia will reduce bat velocity and warming-up with various weighted greater than the average standard game change the batter's swing pattern. implements.

Two technical styles have survived over the last several decades. The chart below compares in the two styles during key aspects of the throw- Of the top-level gliders in the world, most of the athletes are using the short-long style of throwing, although many coaches belief in the long-short method. Regardless of the style used, the coach and athlete must find what can work best of that individual Coaching Points for the Glide Getting Started The shot is raised over the head; the wrist is bent facing upward, the ball rest at the base of the fingers. The shot is then placed on the neck, under the jaw with the thumb touching the collarbone. The ideal path of the shot is straight as possible from starting position to the release, with a gradual increase in the height of the ball from the start of the glide. Across the ring The start varies from thrower to thrower, but some basics remain constant. The purpose of the start is to enable the thrower to get in to a good power position with more speed on the ball than from a standing put. The thrower faces the rear of the ring in an upright position with the feet together, from this position several different starts can be used: The upper body is bent slightly over the right leg, knees are together and the left foot is slightly behind the right foot at the starting position. The lower body falls back or unseats from the waist, then the left leg is stretched and kept low as it extends across the ring. The right heel leaves the rear of the ring after the left leg is extended. As the thrower gains experience, the thrower can lower the upper body into a crouched position. Active left leg start The upper body is bent slightly over the right leg, the left foot starts in the middle of the ring, and the legs are brought together at the knees as the upper body is dropped down slightly. World Class Variations Most top-level throwers use the advanced start, some world-class throwers add to this technique. Ulf Timmermann and many other European gliders, rise up on the right toe in the back of the circle as the knees are brought together. A longer path of acceleration on the ball and added momentum out of the back of the circle are the main factors for this variation. Across the Ring Most of the force to get across the ring is generated by unseating and driving the left leg to the toe board. The right leg is picked up and place near the center of the ring. The upper body remains passive and back, for most throwers the left arm will remain back and over the right leg. Once the athlete starts the glide across the ring, the thrower must keep the ball and body moving toward the throw. Shot-putters need to increase the speed of the throw during this movement and set up a proper throwing position. The Power Position The shot-putter lands on the ball of the right leg, the left foot touches down after the right foot, the feet will have a right heel to left toe relationship, so the hips can open during the putting phase. The throwing stance varies in width depending on the technique employed by the athlete. The long-short technique has a narrow base, with the left foot landing on or past of the mid-line of the circle at a degree angle from the throw. The short-long style utilizes a wider throwing stance, generally behind the middle of the circle with the right foot turned slightly from the starting position in the back of the ring, approximately degrees from the throwing area. The shot remains over the right leg, the upper body is still passive, and however, some athletes actively open the left arm as the athlete reaches the power position, but the shot is always kept back over the right foot with good technical throwers. The shot put should down, the right elbow below the right hip when looking at a side view. The lower the ball, the greater the pull and the longer the path to apply force on the shot. The longer base has an advantage because of the wider base of the power position, there is a longer increase in the acceleration path of the shot will travel when the athlete applies muscular force. However, the longer path of acceleration must be over a short period of time because the velocity of release is such critical factor for the shot putter. The left leg braces with a blocking action, as the left arm opens to the middle of the throwing sector. Then, the right side begins the throwing action with a high arm strike, the elbow up near the ear, the left arm pulls in toward the chest. The left hip remains behind the knee to increase the blocking action during the put; the legs extend and remain on the ground as long as possible. Finally, during the final putting action, the legs lift off the ground and the put is finished at a throwing angle between degrees. The right leg lands against the toe board, with a flat foot parallel throwing area, and then the center of gravity is lowered for added stability and balance after the release of the shot. Shot Put Stand Throws Two handed chest pass: The athlete steps forward with the left leg and throws a light medicine ball. The thrower has the elbows out and the thumbs down for the chest pass throw. Next, the thrower can twist to the right and throw with more force from the right side. The thrower faces the front of the ring with feet forward, shoulder width apart and the knee slightly bent. The thrower places the shot into the neck and holds the left arm straight and toward the center of the throwing sector. The athlete then drops the right side of the upper body down so the right elbow below the hip. The athlete drives the right side up to complete the throwing drill; the throws are completed without a reverse. The next progression the crunch drill the athlete places the left hand to the forehead. The final progression n the crunch the shot-putter places the left arm down over the right knee to create some separation from the upper and lower body. All the crunch drills can also be done with a medicine ball. Stand throw The shot-putter sets up the upper body similar to the crunch drill with the left arm down. The left leg is lifted up inches off the ground to simulate the right to left action in the throw. The delivery phase is the same as the full throw. The width of the base will depend on the type of technique used. Stand throw-Glide The thrower gets into the power position, for most gliders the right foot will be placed near the middle of the circle. Once the left leg touches the ground, the thrower focuses on lifting up with the upper body. Glide Shot Put Drills Unseat into wall The athlete gets into the starting position about one foot from a wall; the thrower lets the body fall back into the wall. This drill teaches the first movement in the glide, the unseating or falling back of the hips. The right stays in the back of the circle, the right heel will remain on the ground. The upper body stays down and over the right leg. Unseat with left leg stretch and right leg step The thrower executes the previous drill then pauses and picks up the right leg and places near the center of the circle. Step across throw The thrower gets into the starting position and instead of gliding steps in the power position. The thrower will unseat, then step back with the left leg to the center of the circle. The right leg is brought up next to the left leg then the left leg moves toward the toe board to the power position. This drill can be executed slowly at first with a stand throw, then the thrower can progress to a step back with the athlete constantly moving forward and execute a put. Straight leg glide The start is the same as a glide expect the left foot is placed the middle of the circle. The left leg is straight and as the athlete unseats the left leg is stretch to the front of the ring. Full glide-no reverse Throwing from a full glide without a reverse is an excellent drill for developing a powerful block and helps the athlete to apply force over long period of time to the ball. For beginning throwers, a wind up can cause problems with balance and consistency; therefore, a static start is recommended for novice throwers in the spin technique. The sh ot is raised over the head; the wrist is bent facing upward, the ball rest at the base of the fingers. The shot is then placed on the neck, most spinners hold the shot closer to the ear then the chin, and the ball is further back on the neck when compared to elite gliders. The left arm is straightened and held out near the mid-line of the body. The torso inclination can vary, however most beginners have only a little forward lean. As the thrower develops, a deeper squat at the start and more upper body slant may be adopted. The Wind up The wind up should be with the upper body turning to the right, with little weight shift of the lower body. The athlete executes the wind up with the feet flat or slightly up on the toes. It is more common today to see a minimal wind up with little to no weight shift in the back of the circle. As the right leg is picked, the thrower sinks or drops onto the left leg. Into the middle The right foot leads the sprint to the middle and an active push from the left leg helps to speed up the lower body. In addition, the knees are brought close together in the middle of the circle to help speed up the throw and help create more torque in the power position. Some advanced throwers wrap the left arm across the body as the right feet lands, creating additional separation. Once the right foot has made contact just past the middle of the circle, the right foot must continue to rotate and the shot should remain behind the right hip until the left foot touches in the front of the ring, with the same heel to toe relationship as in the glide technique. Once the right foot touches down the main acceleration phase of the throw begins. Spin Shot Put Drills Stand throw-Spin In the stand throw for the spin shot, the thrower gets into the power position with a narrow base; usually the feet are within the front half of the circle. The shot-putter focuses on turning then lifting with the feet, which is the opposite of the glide technique. Slow full throws The athlete executes the full technique but a slower pace focusing on body positions, usually with lighter implements. The wind from the full throw can added after the drill is mastered. Turn to the middle The athlete executes the first half of the throw, but the left leg remains in the back of the circle. The drill should simulate the actual body position in the full throw, keeping very little weight on the right leg on the step out. Turn to the power position The athlete executes the initial throwing motion, landing in the power position. The emphasis is on balance and landing in a good throwing position with most of the body weight over the right leg. The positives and negatives of each technique The glide seems better suited for tall, largely built athletes. The glide has more consistent results and is easier to execute. On the negative side, the glide has a limited force application and speed development across the ring. Athletes of all sizes and strength levels can use the spin. The greater and longer application of force and momentum produces further throws in the spin. The ball is constantly moving in the spin technique, setting up a more explosive finish. However, the rhythm of spin technique is a difficult to master especially for athletes with limited practice schedules. Also, the path of the shot is not as linear as the glide causing inconsistent release patterns. The wind up is very individualistic, but for the beginner, the simpler the better. One preliminary swing is enough to establish a rhythm to start the throw and should be simple and consistent. Most the speed developed in a throw is in the other phases not the wind up. Higher turning speed in the back of the circle means a higher risk of the delivery phase not being executed properly.

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performances that is researched based, sport specific, and conducted during the precompetitive training phase with possible injury prevention is called weighted implement training (,17).

Comparison of the reliability of the vertical ground reaction forces during the single leg hop test for distance and the alternating limb crossover hop test for distance in subjects. Predictors of meet performance in masters Olympic weightlifters. May June 2, Bone mineral density in Masters Olympic weightlifters. Influence of anthropometric factors on balance in Masters Olympic weightlifters. Bar trajectory and kinetic analysis of two youth elite weightlifters. Acute effects of vibrating foam roller on triceps surae stiffness. Bilateral comparison of upper extremity peak force during isokinetic closed kinetic chain pushing in adults with healthy shoulders. Differences in landing kinematics during unweighted and resisted vertical jumps. The single-arm seated shot put test as a functional outcome measure in adults with healthy and painful shoulders: The effects of isolated joint versus multiple joint training on the shoulder. Accuracy of self perception of foot strike while running [poster]. Accepted for presentation at: The effects of exercise on the shoulder internal rotators: Comparison of two measurement methods for bar power during clean and front squat. To window or not to window? The effects of window thresholds on knee isokinetic testing. Evaluation of center of mass medial-lateral stability during stair gait between young and older adults. Comparison of sacrum and total body center of mass kinematics during stair gait between young and older adults. Reliability of upper extremity isokinetic push and pull work test [poster]. The effectiveness of low volume versus very low volume upper extremity plyometric exercises on shoulder performance. Effects of kettlebell mass on lower extremity joint kinetic during overhead kettlebell swings in women. A comparison of isolated total leg strengthening vs functional training on strength, power, balance and agility in healthy individuals. The effect of sitting on stability balls on nonspecific low back pain and core endurance: The effects of hip abductor and external rotator fatigue in patients with patellofemoral pain syndrome compared to healthy individuals. Effect of imposing a delay during bench press. Validity of single-arm seated shotput test to reflect upper extremity power. Relationship between hang power clean power production and volleyball spike velocity. Comparison of two methods to measure clean and push press bar velocity. Comparison of two methods to measure snatch and front squat bar velocity. Strength of the shoulder muscles based on scapular position: Biomechanical loading of the American kettlebell swing. Effect of trial length on reliability of single leg balance testing on stable and multi-axial surfaces. The effect of sample duration on the reliability of single leg balance testing. Modified clinical tests of sensory interaction and balance composite and ratio score reliability. Comparison of limits of stability testing on static and dynamic surfaces. Prospective, randomized clinical trial of the effects of open, closed and combined kinetic chain exercises on patients with patellofemoral pain syndrome PFPS. Boessneck, K, Riemann, BL. Biomechanical analysis of the kettlebell swing in women. Assessment of closed kinetic chain isokinetic testing of upper extremity average power production. Effects of ball mass on plyometric throwing exercise intensity. Prospective randomized training study evaluating low versus moderate volume plyometric training on functional outcome measures of the shoulder. Lead limb used during drop jumps affects initial vertical ground reaction force symmetry. Comparison of upper extremity muscle activation between different inertial exercise equipment. Velocity spectrum torque testing of shoulder internal rotators. The effect of scapular fatigue on upper extremity power. Randomized controlled trial analyzing effects of a stimulated computerized shoulder model training on the accuracy of the forces used during shoulder mobilizations in first-year physical therapy students. Comparison of the effects of open vs closed kinetic chain exercises on patients with patellofemoral pain. Comparison of low volume versus high volume upper extremity plyometric exercises on shoulder performance. A randomized prospective training study of open kinetic chain and closed kinetic chain perturbation training in clients with shoulder pain. Effectiveness of low versus moderate volume plyometrics training on functional outcome measures of the shoulder. Intra-tester reliability for quantification of forces with accessory and physiologic movements using computerized instrumented shoulder models. The Effect of scapular fatigue on upper extremity power. The effects of simulated computerized shoulder model training on the accuracy and consistency of shoulder mobilizations in first-year physical therapy students. The effectiveness of isolated exercise shoulder rehabilitation program on patients with shoulder pain; and detraining effects. Intrasession reliability and the relationship between the explosive bench press and medicine ball chest pass assessments of upper extremity power. Using a computerized instrumented shoulder model to determine intra-tester reliability for accessory movement forces. Objective quantification of forces used with joint play and manual therapy techniques for the shoulder. Intra-session and inter-session reliability of a modified trunk rotation flexibility test. Ground reaction force analysis of the anterior and crossover single leg hop tests. Shoulder muscle activation of novice and experienced weightlifters during dumbbell bench press exercises. Shoulder muscle activation of novice and weight-trained females during push-ups on an unstable surface. Hip muscle strength, bilateral ratios, antagonistic ratios and single leg squat performance in persons with low back pain and controls. Effects of drop landing height on bilateral asymmetry on ground reaction forces during depth jumps. Effects of stance width on hip displacement during parallel squat in women. Effects of medicine ball load on chest pass performance and selected underlying kinematics. Kinematic analysis of four plyometric push up variations. Kinematic analysis of the landing phase onto an elevated surface in box drop plyometric push ups. Spine and hip kinematic differences between dominant and non-dominant kicking in collegiate women soccer players. Kinematic analysis of heel raise exercise with three foot positions. Kinematic and kinetic analysis of the squat with and without knee wraps. Comparison of ground reaction forces between four plyometric pushup variations. Comparison of standing single arm shot put performance between limbs with different loads in collegiate baseball players. Comparing one-arm seated shot put throw performance between baseball and non-baseball athletes. Comparison of spine kinematics between dominant and non-dominant leg kicking in collegiate women soccer players. Plyometric training of the core and effects on trunk and shoulder outcome measures. Establishing unilateral ratios of the rotator cuff musculature using hand-held dynamometry. Bilateral comparison and reliability of ground reaction forces during single leg hop test Annual Meeting of the American College of Sports Medicine poster ; May 28, ; Seattle, WA. Bilateral comparison of propulsion mechanics during single leg vertical jumping. Establishing unilateral ratios of scapulothoracic musculature using hand held dynamometry. The effects of bouncing the barbell on kinetic energy during the conventional deadlift. Center of pressure better approximates body center of mass movement than either the thorax or pelvis during firm surface Balance Error Scoring System testing. The effects of hip abductor and external rotator fatigue in patients with patellofemoral pain syndrome compared to healthy adults. Effects of load on peak power in the clean and push press. Limb and medicine ball mass effects on seated single arm shot put performance. Spatial-temporal and medial-lateral center of mass characteristics of young and older adults traversing level, uphill and downhill surfaces. What are the optimum parameters for plyometric training of the shoulder: Intra-tester reliability for quantification of forces with accessory and physiologic movements stratified between first, second, and third year physical therapy students using computerized instrumented shoulder models. A prospective randomized training study of open kinetic chain and closed kinetic chain perturbation training in subjects with shoulder pain. How does fatigue affect rotator cuff and scapulothoracic muscle performance? The effects of isolated versus multiple joint exercises on the knee, hip and ankle musculature and functional tests. Computerized instrumented shoulder model intra-tester reliability for quantification of forces applied during selected manual therapy techniques. Manual therapy techniques of the shoulder: Reliability and validity of the Boston Biomotion Instrument in the measurement of upper extremity power and a comparison to the seated shot put test. The effectiveness of blocked vs random exercise training programs using isolated shoulder exercises and selected outcome measures. EMG analysis and pain ratings of 3 lunge directions with a matched-cohort of symptomatic and asymptomatic subjects with patella-femoral pain syndrome. Ground reaction forces from depth jumps at different heights do not support standard weight limitations. Biomechanical comparison of forward and lateral lunges using standardized and self selected and step lengths. The relation between field tests and novice success in Olympic-style weightlifting.

THE EFFECTS OF VARIED WEIGHTED IMPLEMENTS ON THE KINEMATICS OF THE SHOT PUT pdf

7: LaCorte Performance Training

Effects of Throwing Overweight and Underweight Baseballs on Throwing Velocity DeRenne et al.[13 - 16] conducted several overweight and underweight throwing studies at the University of Hawaii from to , which represents the published overweight and underweight literature from to

Basic principles for understanding sport mechanics Before we begin, we need to brush up on the mechanical principles that are fundamental to understanding sport mechanics. The following reference section provides an overview of the mechanical terms mass, weight, and inertia; linear and angular motion; and speed, velocity, and acceleration. Mass Mass simply means substance, or matter, and is typically measured with the units of pounds lb or kilograms kg. People often interchange mass with weight, but scientifically these terms mean two different things. If an object has substance and occupies space, it has mass. Mass is the quantity of matter that the object takes up. Weight, on the other hand, is this quantity of matter plus the influence of gravity or, more precisely, gravitational force. For example, someone with a mass of kg will have a force of weight measured in newtons, N of 1, N. So for coaches, athletes, and sport scientists, mass is the most common term we should use, and weight is the force this mass generates. We frequently talk of National Football League NFL linemen as being massive or having tremendous body mass, indicating that the athletes are enormous and have plenty of muscle, bones, fat, tissue, fluids, and other substances that make up their bodies. Athletes who want to perform well in their chosen events carefully monitor their body mass. They know that too much or too little mass can seriously affect their performance. For all of us, checking our body mass is a means of assessing our general health and fitness. When we get on a scale, the dial gives us a reading that we associate with the amount of body mass that we carry around. This is true, but what actually happens is a little more complex, as discussed next. The readout on the scale represents how much pull or attraction exists between the two. The earth pulls the athlete downward. So an athlete with more body mass compresses the springs to a greater extent than an athlete who has less body mass. As a result the needle on the scale moves farther around the dial. Inertia We use the word inertia in everyday life to characterize the behavior of people who are slow to commit themselves to action. Inertia means resistance to change. If we are looking at something moving, then the mass of the object will directly relate to the inertia. Naturally, the shot put is harder to get moving; so the greater the mass an object has, the more inertia it has too. We must also consider one more important characteristic of inertia. Once on the move, objects always want to move in a straight line. A giant lb kg athlete needs to exert great muscular force to get his body mass moving. Once moving in a particular direction, the athlete must again produce an immense amount of muscular force to stop or change direction. Athletes with less body mass have less inertia and therefore need to apply less force to get themselves going. There are many examples in everyday life of inertia at work. Oil tankers that cross our oceans have tremendous mass and inertia. They need powerful engines to get them going and huge distances to stop and to turn around. Consider Japanese sumo wrestlers or defensive and offensive linemen in American football. Just like the oil tanker, these athletes must apply tremendous force to get their body mass moving and then apply a huge amount of force to change direction or to maneuver the great masses of their opponents. Massive athletes tend to have a poorer strength-to-mass ratio than do smaller, less massive athletes; so they have a tougher time stopping, starting, and changing direction. An interesting example of inertia at work occurs when athletes are in flight. Consider two athletes who decide to bungee jump from a bridge. One athlete is twice as massive as the other. They step off the bridge at the same instant. Surprisingly, they accelerate toward the earth at approximately the same rate. Because the earth attracts the more massive bungee jumper twice as much, you might think that this athlete would accelerate downward twice as fast. But this same athlete has twice the inertia of the other thrill seeker and so resists being accelerated by gravity twice as much. In this situation, air resistance plays a negligible role, and the two athletes accelerate downward at approximately the same rate. Think of inertia as an enemy when an athlete wants to get moving. Once the athlete is on the move, inertia can become a friend because the second characteristic of inertia is that it wants to keep the athlete going. The difference between resting inertia and moving inertia causes athletes to expend much more energy at the start of a m dash than when sprinting in the middle of the race. The two characteristics of inertia, resistance to motion and then persistence in motion, are seen not only in linear situations in which objects and athletes move in a straight line, but also in rotary situations when objects such as bats and clubs are made to follow a circular pathway. As long as the athlete makes a baseball bat travel around in an arc, the bat will try to continue moving along this circular pathway. In linear movement, mass is synonymous with inertia. The more mass, the more inertia. This law also applies to rotary situations. But rotary inertia also called rotary resistance or moment of inertia involves more than just the mass of the object. We also need to know how the mass is distributed i. Chapter 4 will cover rotational movement. Linear and Angular Motion The movement of an object can be classified in three different ways. Movement can be linear in a straight line , angular in a circular or rotary fashion , or a mix of linear and angular, which we simply call general motion. In sport, a mix of linear and angular movement is most common. Linear motion describes a situation in which movement occurs in a straight line. Linear motion can also be called translation, but only if all parts of the object or the athlete move the same distance, in the same direction, and in the same time frame. For example, an athlete in the m sprint wants to travel the shortest distance from the start to the finish. The shortest distance is a straight line. Many terms are used to refer to angular motion. Coaches talk of athletes rotating, spinning, swinging, circling, turning, rolling, pirouetting, somersaulting, and twisting. All of these terms indicate that an object or an athlete is turning through an angle, or number of degrees. You can think of an axis as the axle of a wheel or the hinge on a door. The most visible rotary motion occurs in the arms and legs. The upper arm rotates at the shoulder joint, the lower arm at the elbow joint, and the hand at the wrist. The hip joint acts as an axis for the leg, the knee for the lower leg, and the ankle for the foot. Movements like walking and running depend on the rotary motion of each segment e. All human motion is best described as general motion, a combination of linear and angular motion. Even those sport skills that require an athlete to hold a set position involve various amounts of linear and angular motion. A gymnast balancing on a beam and the aerodynamic crouch position during the acceleration prior to takeoff in ski jumping are good examples. In maintaining balance on the beam, the gymnast still moves, however slightly. The ski jumper holding a crouched position attempts to reduce air resistance to a minimum and accelerate as much as possible prior to takeoff. Sliding down the inrun holding a crouched position is a good example of linear motion. But the athlete never fully maintains the same body position throughout, and the inrun is not straight throughout, so any motion that the ski jumper makes will be angular in character. Perhaps the most visible combination of angular and linear motion occurs in a wheelchair race. The motion of the wheels carries both the athlete and the chair along the track. Down the straightaway, the athlete and chair can be moving in a linear fashion. This combination of angular and linear motion is an example of general motion. Speed, Velocity, and Acceleration Just as the terms mass and weight are interchanged sometimes incorrectly , a similar situation occurs with speed and velocity. While both terms indicate how fast an object is traveling, with respect to time, they have subtle differences. Speed is a scalar measure indicating how fast an object is traveling, measured by dividing the length or distance traveled by the time; but speed does not quantify the direction of travel. Velocity, on the other hand, is the change in position divided by the time. If an elite sprinter runs m in 10 s, we know that the athlete has run a certain distance m, or And in running m on a straight track, since the direction of travel is in a straight and consistent line, the change in position is also m, so there is really no difference in calculating speed and calculating velocity in this instance. However, sometimes we need to know in which direction, as well as how fast, the object is traveling i. In these situations, velocity is the better term to use. For example, when kicking a ball, as the ball takes off we can look at how fast the ball is traveling in the horizontal direction, in the vertical direction, and the resultant of these two components. To measure how fast the ball travels in these planes, we measure velocity, not speed. The velocity that the sprinter averaged over a distance of m is A sprinter who averages The athlete then has to run faster somewhere else in the race to average Rates of acceleration vary dramatically from one athlete to another. Some athletes rocket out of the blocks and have tremendous acceleration over the first 40 m of a m race. Thereafter their rate of acceleration drops off, and close to the tape they may even decelerate. Athletes who raced against multiple Olympic champion Carl Lewis were well aware that he could still be accelerating at the 70 m mark in the m dash. His rate of acceleration may have been less than that of his opponents at the start of the race, but his acceleration continued longer. In the m event, the 50 m velocity measures for Michael Johnson as he broke the m world record in the time of It is possible for athletes to reduce their rate of acceleration and still increase velocity.

THE EFFECTS OF VARIED WEIGHTED IMPLEMENTS ON THE KINEMATICS OF THE SHOT PUT pdf

8: Shot Put and Discus Technique â€“ Digital Track and Field

Effects of Throwing Overweight and Underweight Baseballs on Throwing whether throwing kinematics and kinetics are different between throwing regulation baseballs.

Sign up Log in performances that is researched based, sport specific, and conducted during the precompetitive training phase with possible injury prevention is called weighted implement training 7â€”15, Weighted modified lighter and heavier implement training has been used by former Soviet Union researchers and strength coaches in track and field for decades 27â€”30,43, The Soviets modified their field event implements, such as the hammer, shot put, javelin, and discus. These weighted implements were used specifically in their specialized speed strength power training programs. The idea behind underweighted training for the track and field athletes was that their body segments would move at higher speeds with less muscle force generated because lighter than normal implements were thrown. On the other hand, the reason for using overweighted training for these athletes was that body segments would move at slower speeds with greater muscle force generated because heavier than normal implements were thrown. Using underweighted implements is considered speed training, whereas using overweighted implements is considered strength training. The Soviet findings suggested the following 3 outcomes: Weighted implement training for baseball consists of exercising with modified standard competitive implements baseballs and bats while safely duplicating the acceleration and deceleration arm and bat movements full ROM at or near game speeds. If these sport skills can be improved, players will have better chances of being successful. For example, if a pitcher can throw with greater velocity, the hitter will have less time to see the pitched ball. Conversely, if the hitter has greater bat swing velocity, he will be able to wait longer before deciding whether or not to swing at a pitched ball. This could ultimately help a team win more games, and at the professional level, allow a player to have a potentially long and prosperous career. Additionally, this article suggests practical applications on how and when to apply these findings. Research findings of light- and heavy-weighted baseball studies have reported significant increases in throwing velocities 1,3,16,20,21,41, Since the s, the youth, high school, and collegiate throwing and pitching weighted implement studies reported significant velocity increases while conducted at competitive distances 8,12,14, Most recently, Fleisig et al. This information supports previous research and demonstrates that players ranging from youth to college age can increase throwing velocity by using weighted implement training. Table 1 summarizes the results of these studies. The neurophysiological mechanism for increasing movement velocity resulting from the weighted implement training is not fully understood at this time. Because the peak force output of fast-twitch muscle fibers can be 4 times greater than that of slow-twitch fibers 22,45 , it has been suggested that highly specific fast movements could recruit and fire these high-threshold fast-twitch muscle fibers 36,38, The results of throwing studies 8,12,14,24 may indicate that greater exertion of muscle force at high speeds was due to a modification of the recruitment pattern of motor units in the central nervous system Thus, selective activation of either of the fastor slow-twitch motor units could be specifically trained by the strength and conditioning coach. From to , Andrews operated on the elbows of pitchers, including high school pitchers Although these data are only from 1 sports medicine center in the United States, they suggest that there is an increase in the number of serious throwing arm injuries of amateur and professional Strength and Conditioning Journal www. Unauthorized reproduction of this article is prohibited.

9: Bat Speed Drills

Highlights. The success of the training-evaluation process depends mainly on the correct choice of the evaluation tests. Force-velocity test and the work of hand action force, are constituted useful protocols for assessing peak power output in shot-put.

The Most effective Bat Speed Tool on the market! Unfortunately, the concept still remained a mystery to the majority of the general public until recent years. These countries took great pride in their athletic accomplishments and poured millions of dollars in research into more efficient ways to build better athletes. After experimenting with their Olympic throwers shot put, javelin, hammer, and discuss they discovered that by increasing or decreasing the resistance of the projectiles that were thrown in practice, they could produce significant gains in throwing distance and velocity with objects of regulation weight. By using too much or too little resistance you will be putting in a lot of effort and time to make yourself better, but it is actually time and effort wasted. This again goes back to the fact that timing and bio-mechanics are essential to sports which require a high technical component. That means in order to accommodate for the additional or reduced load, the athletes would change their movement pattern--which means, in baseball terms, they would change the way they swing or throw, making the training essentially useless. The phrase "practice makes perfect" is often used by coaches, but in reality only perfect practice makes perfect. That means someone wishing to increase his bat speed must take each practice swing with perfect technique at game speed in order to have the hope of making noticeable improvements. To become fast and explosive, you must train to be fast and explosive. Quality always wins over quantity. A quick example would be looking at a marathon runner vs. A marathon runner runs for miles at a time in training. A sprinter runs a few short sprints. They are both running but the differences lie in a intensity, b volume of training, and c rest intervals. Changing those 3 variables makes the outcome of the training drastically different. The take-home message is: If you want to increase your bat speed, you have to practice swinging as fast as possible with perfect mechanics. Once we had an idea of where to start in regards to percentages with the overload-underload we began experimenting with players of different ages and ability levels. The goal was to find the ideal percentage to weight the bat in order to get optimal performance increases - improved bat speed. Elite sprinters and swimmers have been effectively using a form of overload underload training to blow away world records. The sprinters and swimmers attach themselves to cords that either provide resistance from behind or a slight tow from in front of them to create a pace that is slightly slower or slightly faster than their personal best. Many throwers from track and field continue to use the overload underload concept with great results. Baseball, which has a history of lagging behind the times in improving sports performance through science, is even beginning to catch on. Many pitchers have been using overload underload training to drastically improve their throwing velocity as well as strengthen their arms for the wear and tear of a professional season. The majority of overload underload training research has been done with throwing a baseball. The research has all come back with stellar results. Not only did the players participating in the program make significant gains in velocity, but they also stayed healthy for the following season, a difficult accomplishment considering the stress that throwing a baseball puts on the muscles, tendons, and ligaments of the arm. Note - the vast majority of these studies deal with training for improved bat speed or throwing velocity through the use of overload, underload, or a combination of overload and underload techniques. This is by no means a complete list. There are many more studies out there relating to overload underload training. Coop DeRenne, Barton P. Hetzler and Kwok W. The Journal of Strength and Conditioning Research: Strength and Conditioning Journal: Indiana University, Bloomington, IN, Effects of overload training on velocity and accuracy of throwing. Does it improve bat velocity? Strength Cond J DeRenne C and Branco D. Overload or underload in your on-deck preparation? Effects of under- and overweighted implement training on pitching velocity. J Strength Cond Res 8: Effects of weighted bat implement training on bat swing velocity. J Strength Cond Res 9: Effects of weighted implement training on throwing velocity. J Appl Sports Sci Res 4: Effects of warm-up with various weighted implements on baseball bat swing velocity. J Appl Sports Sci Res 6: DeRenne C and Okasaki E. Increasing bat velocity Part 2. Acquisition of throwing skill involving projectiles of varying weight. Springfield College, Springfield, MA, Kinematics and kinetics of youth baseball pitching with standard and lightweight balls. Varied resistance in power development. Mod Athlete Coach Sergo C and Boatwright D. Training methods using various weighted bats and the effects on bat velocity. J Strength Cond Res 7: Southard D and Groomer L. Warm-up with baseball bats of varying moments of inertia: Effect on bat velocity and swing pattern. Res Q Exerc Sport Contributing factors for increased bat swing velocity: Effect of overload warm- up on the velocity and accuracy of throwing. Use of different weight to develop specialized speed-strength. Sov Sports Rev If you are interested in finding out more about the scientific studies on overload underload training, a simple search at http: To obtain the full study not just the abstract you might have to go to a local library. I point this out because oftentimes people will make extraordinary claims about products or ideas being the next miracle cure. Looking for drills to improve bat speed? What happens if a player has sound mechanics already though? The drills will fail to improve bat speed and it will be time spend practicing with nothing to show. Just grab the bat and swing it. The weight of the bat combined with a program that regulates training volume will do the rest. Players regardless of level, and mechanical efficiency, can see results. Check out the what the research has to say below.

THE EFFECTS OF VARIED WEIGHTED IMPLEMENTS ON THE KINEMATICS OF THE SHOT PUT pdf

Man and monsters at Sutton Hoo, by Norman Davis. Agencies of enforcement But what if she wants to die Sex, Sisterhood, and Self-Delusion Last Wolf Hunting (Silhouette Nocturne) Sonar report plugin 1.3.2 Sam Smiths great American political repair manual Voice of an eagle Daily power and prayer devotional myles munroe Garfield: I dont do perky Challenging reform Black girl, by S. Ousmane. Audits of colleges and universities Cleveland A.A.s leave the Oxford Group Two English folksongs Barefoot reporter Trollope chronology Early Reinforce Concrete Studies in the History of Civil Engineering Brass Ankle Blues The Middle East and North Africa : Jewish and Islamic politics Cultural bulimia. What part did Metternich play in the downfall of Napoleon? Knock Knock. Youre Dead (House of Horrors, No 5) The Healing Sounds of the Didgeridoo Handbook of Demonstrations and Activities in the Teaching of Psychology, Second Edition: Volume I The road to reality penrose A Winter Journey through Russia, the Caucasian Alps, and Georgia Antique fairy tales Underwear: a history. Illuminated landscape Apology, Crito, and Phaedo of Socrates (Dodo Press) Spiderwick chronicles book 3 Conditions of peace Plymouth county marriages, 1692-1746 The Baltimore Ravens The heisman trophy winners Documentation Requirements for the Acute Patient Record V. 1. Ordinary differential equations. Dynamic retention model for Air Force officers Harmful chemicals