



VELO BUFFET

ARM CARE & RECOVERY PROGRAM

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This program was created provide a foundation for going into a throwing program, velocity program, or your season. The common belief in the throwing world right now is that you must throw more, throw harder, and throw further to developing your arm. This thought process has lead to an injury rate of about 50%. The definition of insanity is doing the same thing over and over again but expecting a different outcome. That is why this program was created. There has to be structure, education, and tools given to you to help keep your arm healthy. A perfect program that isn't consistently implemented is useless. The perfect exercise that isn't performed correctly is also useless. This program uses evidence-based practices and evidence led techniques to fill in the widening gap that is arm injuries. With that being said, this program can serve several different purposes.

1. Arm Strength and Conditioning
2. Pre-habilitation
3. Performance Enhancement

This program isn't limited to these purposes. How and the time of year will help determine its purpose. There will be a few different calendar options that will give insight into how you should use this program. But remember that consistency and proper execution of drills will put you in the best position to stay healthy and ready for whatever lays ahead for your arm.

Buy In

Purpose, Justifications, and Explanations

Many athletes only perform programs because the team or program they play for requires them to. This leads to athletes questioning why they should do the program; why is it important, and will it help them. Ultimately, many athletes go through the motions, skip portions that they deem unnecessary, and/or not care about how they are doing the prescribed exercises. If you find yourself feeling that way, keep on reading. Each drill will have a purpose so you won't have to worry about wasting your time.

Purpose

Arm Strength and Conditioning

There is a common belief of throwing more is what develops arm strength and conditions your arm. If this principle was taken and applied to another skill, sprinting, it would result in athletes sprinting workouts to consist of only running as hard and as far as possible. The only variable that changes would be distance. Yes, you might get faster at the start but over time you will run into several issues that can be grouped into overuse injuries. This is exactly what is happening to arms. To strengthen the arm we must increase either the intensity (weight) of an exercise and difficulty of an exercise. To condition the arm we must also increase the difficulty of the exercises that we use but also increase the volume (repetitions) performed. This program takes this into account in each respect and provides a holistic approach to arm care. This program will serve to provide the foundation for you to start a throwing program, weighted ball program, or velocity program.

Pre-habilitation

Pre-habilitation is the idea that you should perform exercises that help prevent injury, rather than waiting for an injury to happen and perform them. The latter concept is rehabilitation. If you are returning from an injury, you should consult your Doctor and Physical Therapist on what you should be doing to return to play. Once you have made your way through the appropriate rehabilitation process for your injury and performed a throwing program, provided by your Doctor or Physical Therapist. This could be a good option to follow after. There are three major reasons why. The first is many rehabilitation programs only prepare you for a fraction of what you need to be able to do on the field. The second is after your first injury, your chances of re-injury exponentially increase. Injured athletes should focus on more pre-habilitation work than the average non-injured athlete. Lastly, when you throw you are actively injuring your arm. Our shoulders weren't meant for overhead throwing and we must take that into account when we are in between games and seasons.

Performance Enhancement

To throw a ball consistently hard, accurate, and precise you must train your arm to perform the proper sequencing of movements, muscle activations, and have enough stamina to do it several dozen times a game. If you use a Bank analogy to understand performance enhancement, think of recovery work as making deposits into your account and throwing as taking withdrawals from your account. If you continuously take withdrawals you will soon go bankrupt. That is what leads to injury.

Another way this program addresses performance enhancement is that it mimics the positions that you must be in while activating the muscles that help stabilize the shoulder and elbow as you throw. Most exercises have you hold a ball during each exercise to reinforce the same movements that you do as you throw. Most arm care programs have you hold a handle, dumbbell, or a plate for exercises. That isn't the most effective way to strength the stabilizers of the shoulder. Having you grip a ball during the exercises will increase rotator cuff activation. This will also help strengthen the muscles that help protect the elbow during throwing.

Justifications

To truly create athlete buy in you must be able to answer the question "WHY?" This question is something that can be asked for several different reasons but the most common reason is they want to learn why they are doing something to justify the amount of time they are dedicating to the program. This can start with the program being used by other athletes. I want to be like " FILL IN THE BLANK" so I will do the same program as them. It can be results driven, I am doing this program because "FILL IN THE BLANK" got results from it and I want the same results. The last and what I believe the standard should be is the scientific justification of the program. With that in mind; this program will start there. I will make statements below and attach the studies that support my statements.

Statements

1. Sport-specific movements help train muscles that you use in your sport.
2. Gripping increases rotator cuff activation.
3. Eccentric strength of the rotator cuff is essential for arm health.
4. Isometric grip strength is a major contributor to elbow health.

Support

Antony, N. T., & Keir, P. J. (2010). Effects of posture, movement and hand load on shoulder muscle activity. *Journal of Electromyography and Kinesiology*, 20(2), 191-198.

Beardsley, C. (2017, June 08). Why are strength gains specific? (and why does it matter?). Retrieved June 14, 2017, from <https://www.strengthandconditioningresearch.com/perspectives/just-get-strong-is-wrong/>

Byram, I. R., Bushnell, B. D., Dugger, K., Charron, K., Harrell, F. E., & Noonan, T. J. (2010). Preseason Shoulder Strength Measurements in Professional Baseball Pitchers. *The American Journal of Sports Medicine*, 38(7), 1375-1382. doi:10.1177/0363546509360404

Cools, A. M., Johansson, F. R., Borms, D., & Maenhout, A. (2015). Prevention of shoulder injuries in overhead athletes: a science-based approach. *Brazilian Journal of Physical Therapy*, 19(5), 331-339. doi:10.1590/bjpt-rbf.2014.0109

Escamilla, R. F., Yamashiro, K., Paulos, L., & Andrews, J. R. (2009). Shoulder Muscle Activity and Function in Common Shoulder Rehabilitation Exercises. *Sports Medicine*, 39(8), 663-685. doi:10.2165/00007256-200939080-00004

Lin, F., Kohli, N., Perlmutter, S., Lim, D., Nuber, G. W., & Makhsous, M. (2007). Muscle contribution to elbow joint valgus stability. *Journal of Shoulder and Elbow Surgery*, 16(6), 795-802. doi:10.1016/j.jse.2007.03.024

Park, M. C., & Ahmad, C. S. (2004). Dynamic Contributions Of The Flexor-Pronator Mass To Elbow Valgus Stability. *The Journal of Bone and Joint Surgery-American Volume*, 86(10), 2268-2274. doi:10.2106/00004623-200410000-00020

Safety Measures

Is measured and tracked for several reasons. The most important is readiness. Grip strength will give you some insight into how ready your arm is for the throwing that day. If you take care of your arm, perform your proper warm up and cool down, your grip strength shouldn't fluctuate much. With that being said there will be days when your grip strength will drop. Those days will be after higher intensity throwing days. If your grip drops by 10% or more at any time, make note and switch to a Palate Cleanser day. If you have a lot of throwing, weeks 4-6 in the throwing program, skip your long toss throwing. If your grip doesn't return to normal within 1-2 days seek out **professional help**.

Signature System

The purpose of the signature system is to allow a coach to check in with you as to how your arm is feeling, if this program isn't being implemented by a coach and you are doing it on your own, have your parent check in with you. This is a moment for you to truly check in and see how your arm is progressing through the program. Remember, "Less is More" when it comes to throwing. One day off of throwing that enables you to keep making your way through the program is invaluable compared to pushing through soreness or pain that could result in several weeks off from throwing.

Soreness Scale or Rate of Perceived Exertion

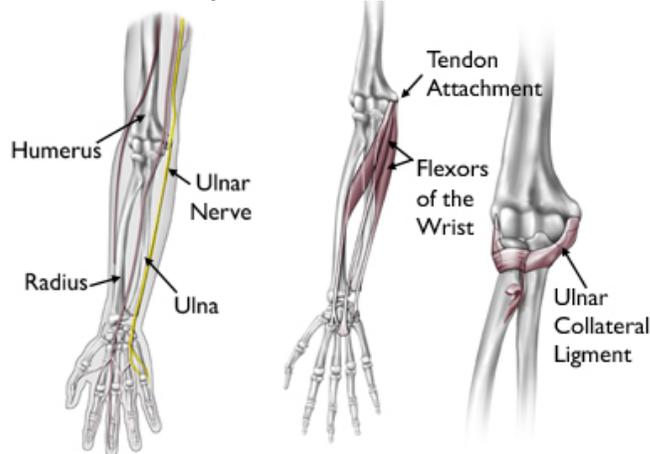
Rate of Perceived Exertion and the Soreness Scale are interchangeable. They have been placed throughout this program as another way for you or a coach to track how hard you are working. It will range from workout to workout but if there is a large difference between the level the program says you should be working at you should drop the intensity you are throwing or stop throwing and allow your body to recover.

***Arm Health Road Map for more on understanding the difference between pain and soreness.**

Arm Health Guide

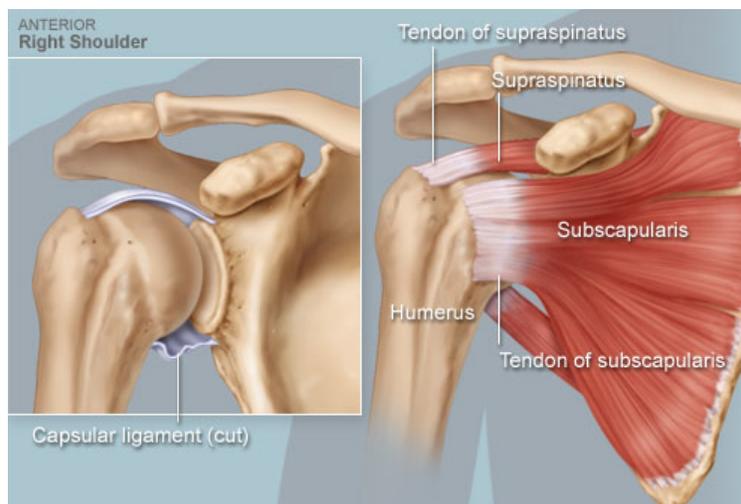
First and foremost, the main goal of our training is to keep athletes healthy. Our comprehensive approach to this includes a baseball-specific strength and conditioning program, shoulder and elbow care, and an in-depth educational process. Our system teaches athletes how to take care of their arms in our gym and on the field. Although we provide the tools needed to maintain a healthy body and arm, **you as the player** are the one ultimately responsible for consistently putting in the detailed work that leads to its manifestation.

To give you insight into the educational component to our program, I'll first discuss the functional anatomy of the most important joints, ligaments, muscles and nerves involved with maintaining arm health. I'll also define what an injury is and the common misconceptions related to injury. Finally, I'll provide the framework of my "Arm Health Guide," how to use it, and how to give you the best chance of keeping your arm healthy.



First we will start with the elbow joint itself. Bones are connected to each other by ligaments. The most important one at the elbow is the Ulnar Collateral ligament, notorious for being the ligament that requires a "Tommy John" surgery to fix when it tears. This ligament's main job is to resist the stress created by throwing. Over time, it can break down, partially tear, or completely tear. Good mechanics, strength

training, and proper arm care all help to prevent any unwanted wear and tear of this ligament.



The muscles that help protect the elbow during throwing are a group called the **Flexor Pronator Mass**. They are the muscles that help you flick your wrist. Lastly, the ulnar nerve is the nerve that runs the length of your arm. When you hit your "Funny Bone," you are hitting your ulnar nerve. It starts at the shoulder, runs down through the little groove next to the tip of your

elbow, and ends at the tip of your pinky and ring fingers.

The next joint we'll discuss at the shoulder girdle. The shoulder girdle has three bones: the shoulder blade (scapula), the collar bone (clavicle), and the upper arm bone (humerus). Your shoulder blade is located on your back, your collar bone is self-explanatory, and the humerus is the upper arm bone. During the throwing motion, your arm will first lay back into *external rotation* away from your target. After it has finished externally rotating, *internal rotation* forwards towards the target occurs.

When throwing, the most important part is keeping the ball in the socket. There are several parts of the shoulder that are responsible for this. The first is a small piece of tissue called the **shoulder labrum**. Its increases the size of the shoulder socket by connecting the shoulder blade to the ball of humerus. Next in line is a set of muscles called the rotator cuff. The rotator cuff is comprised of 4 muscles that help keep the ball on the tee. Two of these muscles are the ones that get sore on the back of your shoulder after throwing. Lastly, the biceps muscle (not pictured) also helps keep the ball in the socket.

All of these muscles, tendons, ligaments, and bones serve a purpose during the throwing motion. The throwing motion is the fastest movement performed in any sport. "With great power, comes great responsibility!" You as a baseball player are responsible for your arm health.

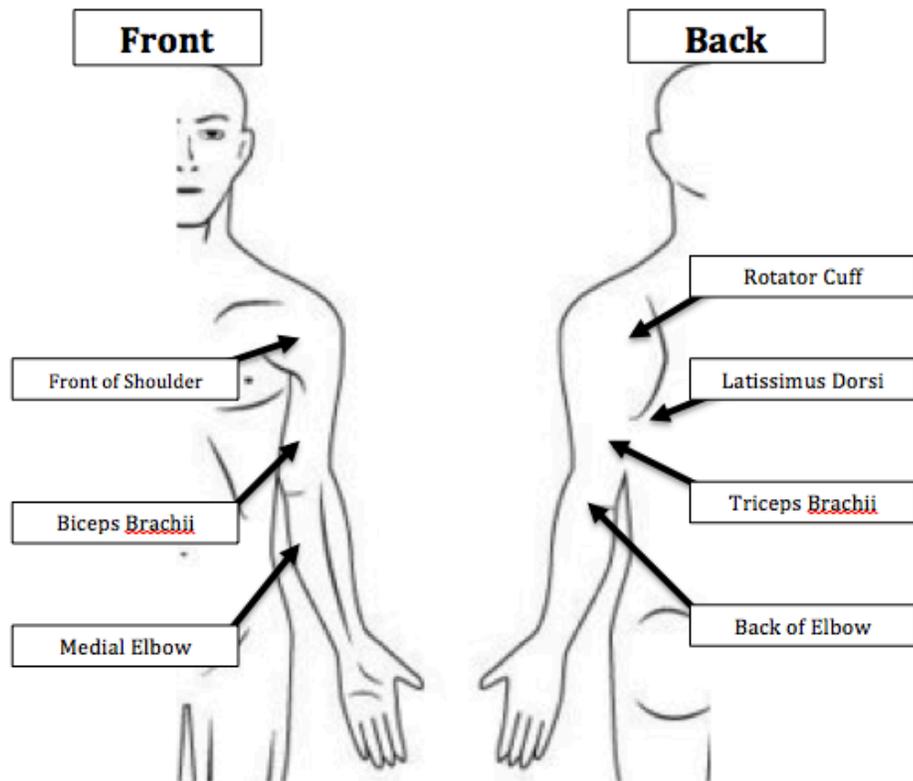
I'll say it again: YOU are responsible for your arm health.

The parts listed above are common areas for injury during throwing. A professor I had during my Master's program described injury in a way that made a lot of sense to me. "Injury is the disruption of tissue, that may or may not lead to a decline in performance." A disruption of tissue is any change, good or bad, of the muscles, tendons, ligaments or bones that were listed above. **The key to this definition is that injury doesn't always lead to a decline in performance.**

Put another way, although you might be able to continue to play, throw hard, getting hitters out, or command your off speed, **you might still be doing damage.** This is because injuries happen over time. An injury experienced at age 21 is rarely a random, independent traumatic experience; the ball probably got rolling at age 13 or 14.

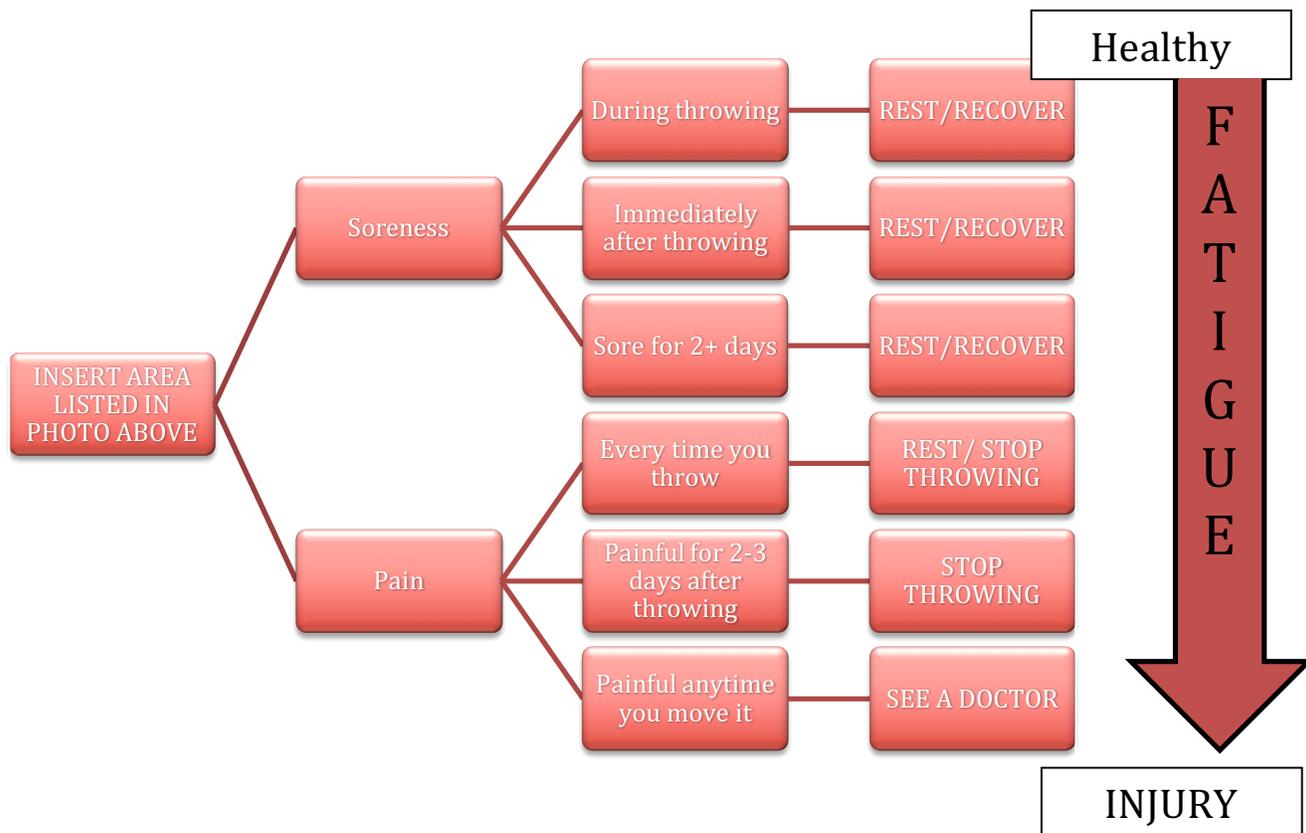
The first picture below will provide a "legend" that is needed to keep your arm healthy. The following graphic will give you a step-by-step guide on how to keep your arm healthy. The "Arm Health Guide" should be referenced every time you throw a baseball. **Why?** According to the **American Sports Medicine Institute**, "The 2014 National Electronic Injury Surveillance System reported **130,376** emergency room visits due to baseball related shoulder, elbow, trunk, lower arm, head, neck, ankle and facial injuries." Moreover, your chances of re-injury dramatically increase after your first one.

Take a moment and think about how your arm feels during or after you throw. Does the spot that gets sore or bother you ever change? Is it your elbow? Is it your shoulder?



Are there any spots listed above that get sore or painful while throwing or afterwards? If so, I have put together a guide for each of those spots that discusses what could potentially be causing pain/soreness, how to prevent/stop it, and when you should consult a doctor.

ARM HEALTH GUIDE



How to use:

1. Choose area from body diagram above.
2. Insert into Arm Health Guide
3. Soreness vs. Pain
 - a. **Soreness** goes away in 1-2 days and doesn't affect the way you throw
 - b. **Pain** can be during throwing or all the time and is painful/tender to the touch.
4. Pay attention if soreness sticks around for more than 2 days.
5. If you transition to pain
 - a. Think about
 - i. Stop throwing – 2 weeks
 - ii. Consider a strength training program
 - iii. See a health professional or doctor

Choose an area from the body diagram shown above. Insert it into the Arm Health Guide and follow the chart. The second step **is** deciphering between soreness and pain. Many coaches believe that these are the same or they shrug them off and tell you to "Suck it up!" I believe that this is **one reason** why a **majority** of baseball players, especially pitchers, will have some type of injury related to throwing during their careers.

The easiest way to decipher between the two is soreness goes away after 1-2 days of rest and it doesn't affect the way you throw. Pain is just the opposite! It can be when you throw, after you throw, or all the time. It will affect the way you throw, perform, and even in your daily life. If that's the case and you continue to throw, you are putting yourself at the highest risk for injury, if you don't have one already.

Once you have decided between soreness or pain, follow the chart and determine the best route for keeping your arm healthy. Rest and recovery can mean a lot of things but to keep it simple, it would be waiting until your arm soreness goes away and resume throwing. There are several ways to speed up the recovery process, (keep an eye out for my next post!) but in many cases it's strength training or conditioning.

If you get to the point of experiencing soreness that lasts more than 2 days, you should seriously consider taking an extended time off from throwing, looking at your mechanics, or a strength training program. As soreness lingers for longer and longer it can transition to pain. The sooner you can recognize this, the better off you are at staying healthy. If you get to the point of pain lasting more than 2-3 days, you should stop throwing for 2 weeks. After two weeks, resume throwing and see how it feels. If the pain is the same, whether you are playing light catch or throwing off the mound, you should see a doctor.

I have been through this process and in the past I ignored each step, which ultimately ended my career with a tear of my ulnar collateral ligament. This wasn't from one throw, but rather from hundreds of throws, and many of them very painful. I lost sight of my long-term goals and only thought about the game in front of me.

If your goal is to play high school baseball, college baseball, or professional baseball, then staying injury-free should be at the top of your priority list. Being injury-free not only allows you to play at the best of your ability; it also allows you to **stay on the field** to keep developing and improving your baseball skills. The second soreness or pain sets in, your ability to perform is limited. Seeing a health professional about an arm injury might put a hold on your ability to play in the short-term, but it will ultimately put you in the best position to play the sport you love for as long as possible.

Phases & Explanations

Each phase has a specific focus, phase 1 is focusing on concentric muscle actions or activating the proper muscles that stabilize the shoulder. Phase 2 focuses on the eccentric muscle actions, so focusing on the muscles that control the deceleration portion of throwing. Phase 3 focuses on force coupling or activating all muscles surrounding the shoulder and elbow at the same time. More explanations are below.

DURING ALL PHASES PROPER FORM IS KEY AND BE SURE TO SQUEEZE THE BALL DURING EACH EXERCISE TO INCREASE THE ACTIVATION OF THE MUSCLES BEING EXERCISED.

Phase 1

The first phase of this program is focused on developing concentric strength of the different muscles that help protect the shoulder and elbow during throwing. There are two keys to making this phase effective, first is proper form. By performing the exercises the correct way you will ensure that the correct muscles are activating and activating in the correct order. The second is holding the top portion of the exercise for 1 second for each repetition. This will increase activation and help increase muscular endurance.

Phase 2

The second phase will focus on developing eccentric strength of the different muscles that help protect the shoulder and elbow during throwing. Once again, proper form is the first key to this phase. The second is that for each exercise you must take 3-5 seconds during the lowering phase of each exercise. Building eccentric strength of the muscles that protect the shoulder and elbow is essential to long-term arm health.

Phase 3

The final phase focus on developing isometric strength of the different muscles that helps protect the shoulder and elbow during throwing. Isometric strength is required to enhance the force coupling effect that protects our joints. Muscles are paired together and co-contract to help provide stability to a joint. You have to build endurance for all the muscles that are required to stabilize the shoulder and elbow. Due to the nature of throwing, certain groups for example the flexor-pronator group, are overworked and their opposing group, the supinators, aren't able to effectively stabilize the elbow.