

Combat Ready Core

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I've been asked to train many sports throughout my career. Figure skating, football, soccer, baseball, martial arts and they all have unique characteristics and requirements. Add to the mix the individual needs and limitations of unique athletes, the psychological aspects of competitions and teamwork, you can quickly feel overwhelmed by the amount of information susceptible to influence program design.

Analyzing and evaluating the needs of a given sport and matching it with the client or athlete sitting in front of us will always be the challenge. In one corner, you have cyclic sports, where you are mostly required to respect a given line and almost one given task such as shut put, javelin, bobsleigh, cycling, or sprinting. In the other corner we have acyclic sports, where every action requires a different type of movement, rather than repeating the same movement in a cycle such as combative sports, hockey, football, etc.

Acyclic sport or not, we need to be functional and strong in all three functional anatomical motions, the sagittal, frontal and transverse planes. The body functions as a whole, and performance is multifactorial, a careful need to address discrepancies

In combat sports, the first to close the distance between them and the other fighter is usually the one who leads the fight. Stand up fighting such as judo and wrestling is a game of grips and take downs. Gain position, move in and take them down. The common denominator here is not only strength/speed of the posterior chain, but the core in general is what will give power to those throws or what will protect you from a take down or keeping distance from the opponent.

Core begins with the extremities. So only thinking about crunches and sit ups is what it is, the basics. The further you hold a weight in front of you, the harder your core will try to stabilize. If you were to hold the weight in front of you, your lower back would fire up and your abs would be the antagonist helping out. If you were to hold a weight in the back of you, your abs would fire up to hold you straight and your low back would be the antagonist helping out by stabilizing and making sure you stay upright.

As soon as forces are being applied on the limbs, the core muscles contracts to counter the weight and stabilize the trunk. In general, thinking of core should define a movement as a whole and a chain of muscles working together to counter the applied force. However, the force applied is rarely linear. Which is why ANTI-rotational movements are so important in any given strength and conditioning program, especially for injury prevention.

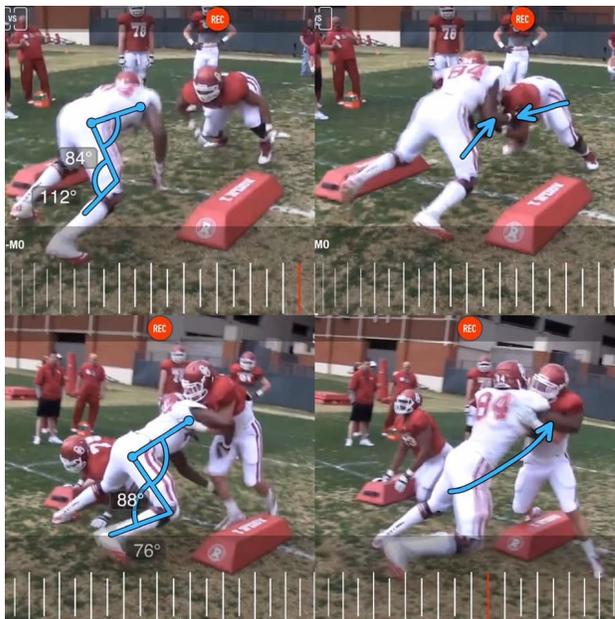
Anti-Rotational Exercises are those that build stability and strength to prevent rotation. “Preventing rotation” means that your body is able to resist forces acting upon it that may try to rotate or move it in a way and direction that it can’t move safely.

High impact sports like football/rugby and combat sports share similarities. Let’s take a judoka and an offensive lineman and see why anti-rotational exercises can bullet proof your core and back. Positional strategy is primordial when a few seconds could settle the score or an advantage.



Tori (white Gi) is pulling Uke (blue Gi) in for a throw, however, Uke counters by trying to break Tori’s bent-over posture to go for a leg sweep which Tori counters yet again by sweeping the only base that Uke had left while breaking his posture pushing him back. You can clearly see the rotational forces and hip movements involved.

You can also see these situations in football or hockey, when you have a 2 or 3 players scramble for the puck against the boards or when a football 300 pounds O-line player arrives full speed to take you out of the way. You need tremendous core and upper body strength to absorb this kind of impact. Sure, the equipment does part of it, however, if strength is a now show, you’ll be a no go after. This is why anti-rotational and eccentric strength are primordial in contact sports.



Enter Rotational force

I always say that core starts from the extremities, enter the rotational force. This is the best example and in many aspects of hockey. In this case, as soon as you lift up the stick to wind up, the

left shoulder and arm extends, stretching up the torso and especially the left shoulder away from the right hip. All this energy building up is the stretch reflex needed to pull down the arm and initiate the downward line for the slap.

N.B. Elastic strength is our muscles and tendons to absorb, store and release energy. The right exercises and type of training will make those movements faster and more powerful.

First off, the stick weighs almost nothing at this point, so even if you attach the pulley at the top of the swing, it would be useless. The rotational force won't come from the weight you have to push down, it will come from many muscles firing up at the same time. You must see different parts of the movement, add them all as a whole, which is the major mistakes of some strength coaches who try to « innovate ».

So no matter how you try to add resistance to a slapshot, velocity is key, which in this case is speed-strength, moving at very high speed with a given load. For Speed-strength, here the Load never changes. Functional strength is the name of the game, more on this later.

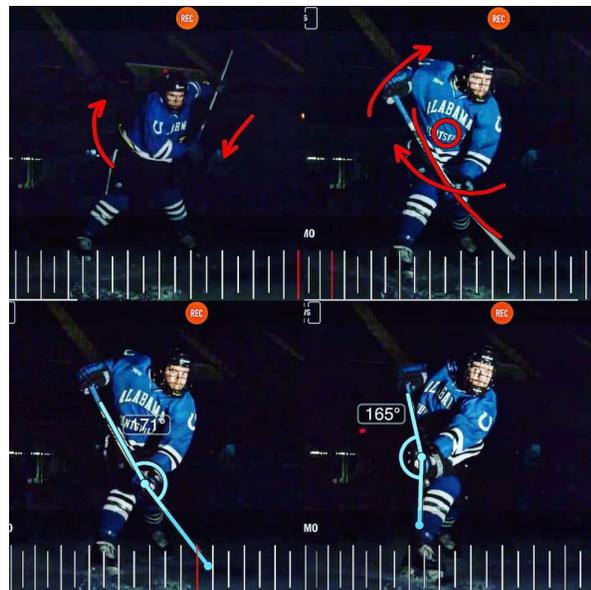
Top right and bottom left picture ->

The stick actually bends a little as it hits the ice, giving the stick some power to sling shot the puck as the player pushes it on top of that. Think internal rotator, pec, shoulder and back, where the right arm pulls back to lift the stick when the right arm presses/pushes upwards.

Bottom right

All the antagonist muscles are at work to slow down the swing, low back, internal and external obliques, abs and lats. Legs do some stabilization work along the way and posterior chain holding on and hamstring controlling knee stability.

Now, a slap shot is not the only thing to look at for a hockey player's performance. If he doesn't get to the puck, it's useless. However, the upper body muscles involved in a powerful slap shot are about the same as the ones for power skating.



Now let's have a closer look at MMA fighters.

As soon as the foot is planted on the floor, a chain of movement is initiated to give maximum power and speed. The kicking leg is extending, in preparation for the hip flexors and knee extensors to load or eccentrically stretch for the forward movement in order for the kicking leg to strike. Then, the planting leg and foot (left) points out, opening up the hip, planting the foot and firing up the posterior chain for a fraction of a second, while both arms pull down and back as a contro-lateral force to increase the power of the hip flexors to lift the kicking leg.

The final stage is the impact, extending the knee a few degrees, at its most powerful angle, just at the right moment, the last 15 degrees. In this case, think working with bands and chains, telemark squats/split squats, etc.



Additionally, the kick is preceded by a long jab, which has a specific purpose/combination. The jab extends the left arm, which increases the range between the left shoulder and the right kicking hip and leg. See anything in particular? What type of exercise could come close to it?

Looking at all possible scenarios, what do we have here? How can we prepare? We have to think about kicking, pushing and kicking power, mainly hip flexors and extensors. We not only have to hold a resistance, we also have to hold a resistance that are at times, greater than our own strength or in positional disadvantage. So basically, and as always, concentric, isometric and eccentric strength are to be considered for performance and injury prevention.

I look for 3 elements.

Position

In what position is the athlete the strongest and weakest? How can I make him faster/stronger? What are his main tasks?

In this case, think core, back, posterior chain, scapular chain.

Performance

How can I make the athlete stronger/faster/powerful? Which exercise will give him the most bang for his bucks and the best performance?

In this case, think Speed-strength, explosive strength, reactive strength.

Progression

Where do I want to bring him/her? What qualities does he need to gain in order to compete at optimal capacities?

If you look at a tree, one with a narrow trunk sporting a big heavy top part, it's easy to think that the tree would easily fall if challenged by external forces. Better analogy yet, how easy would it be to fire a canon from a canoe? Let the visual sink in (pun intended).

Regarding the muscles that involve the infamous "core", it does not only involve abdominals or lower back, but also the deep muscles such the Quadratus lumborum, the transverse, the hip flexors, the psoas, the oblique internal and external. Although in the lumbar region, the erectors and the multifidus also plays an important role for the core. Even the fascia, connective tissue sheet, mainly collagen, under the skin that attaches, stabilizes, encloses and separates the muscles and other internal organs, rises up to the neck and down to the toes.

With all the information above, where can we start? Evaluating the needs of the sports and the athlete.

Let's start by the feet! For any jabs or throws, the feet initiate the intention, quick reaction, or base against a pulling force. The boxing jab has little to do with the strength of the arm. It is like a whip-crack, produced by a ripple in the material of the whip traveling towards the tip, rapidly escalating in speed until it breaches the famous bullwhip sound. Visualize the jab the same. The back leg is pushing you forward and the chain of movement, from the legs, the core and shoulder transfer all the energy on to the extension on the arm (your fist) similar to the whip. As the jab's purpose is to mainly distance the opponent, the clinch's purpose is to close in, control his posture and block further attacks, **pulling** him in against his resistance. As you throw the jab or close in for the clinch, the muscles of the posterior chain are the main subjects.

When we talk about the posterior chain, it involves and starts from all the little stability sensors and small muscles in the foot, which initiates the drive forward, firing up the calf

muscles. Then the quadriceps and buttocks extend the knee of the back leg driving the explosiveness of the drive forward. The front leg engages the hamstring, pulling the body forward.

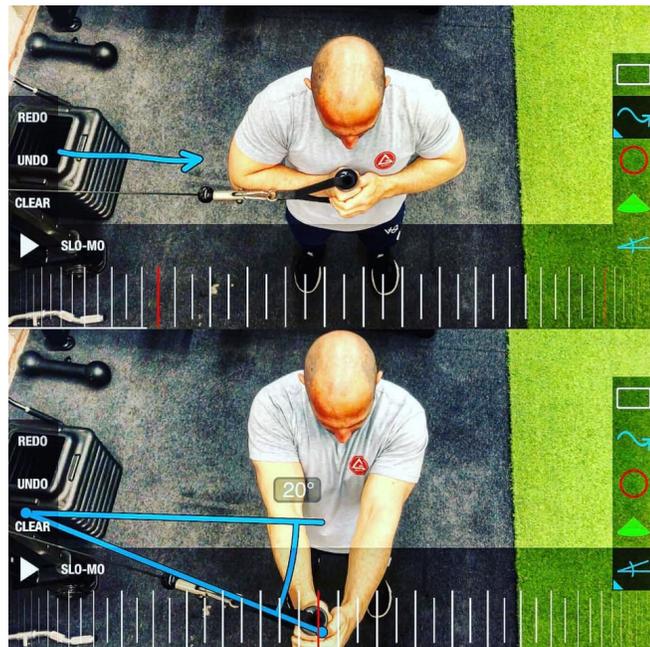
Essentially, if the foot is not strong and stable, it might impair the proper firing of the movement sequences, limiting performance. Simple test such as closed or open eye balance test can reveal underlying issues.

The same goes for abdominal strength. Proper assessment of transverse, QL, as well as the obliques can have a tremendous effect on core stability and strength. Proper bracing needs to be evaluated before anything else with simple challenges such as plank holds. However, we have seen issues with bracing and improper firing of the obliques which could have an impact on rotation and anti-rotational strength and power.

For isometric core/low back strength, my go to exercise is the QL lift, as in Quadratus Lomburum, which are the muscles attached to the first ribs, low back and iliac crest. It is the same as doing the plank but you are lying down sideways with your elbow on the floor. Lift your hips while only your elbow and feet are on the floor. To increase range of motion and difficulty, execute with your feet slightly elevated on a bench.

Anti-rotation exercises

Once some of the issues are fixed and proper firing is resolved, very simple exercises can be added to your arsenal. We use pulses, which are small, fast and challenging burst of counter resistance while holding a given position. Take a mid pulley palof press, where you stand sideways while holding the pulley handle to your chest. A simple Palof press for reps would be to extend the arms in front, somewhat of a load shifting, making it harder to hold since you push the weight away from the fulcrum or base, while holding the position for 3 to 5 seconds.



To increase difficulty, someone would challenge the position sideways, upwards and downwards on the wrist, while the arms are extended, increasing the recruitment on

the obliques to stabilize the position. This could also be done while holding a swiss ball. Feet position is crucial for this as well. Obviously, the closer the feet are, the harder it will be but you can also use a staggered feet position, which increases the activation of the internal and external obliques cross sections depending on which foot is put forward.

While all these tips are simple to apply, the strength sensei team is planning new classes which will go in depth into testing, evaluating and coaching these new principles along side Charles time tested principles and strategies. We want these classes to be the new standard in the industry. All the members of the strength dojo's will be the first to know in the next few months when and where so keep an eye out and keep training hard. If any of you have more questions, do not hesitate to go on the forum and ask away!

Strong days ahead!

Coach Eric