Santa Clara Kenpo Karate

American Kenpo Training System

FIGHTING STRATEGIES FOR THE SMALL-FRY

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by

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ABSTRACT

FIGHTING STRATEGIES FOR THE SMALL-FRY

By: Kim Capell

One of the most powerful and significant tools in self defense is attitude and believing that you can protect yourself. While this is a simple, straightforward statement, I can't emphasize enough how difficult it is to employ this tool for the individual confronted with a bigger, stronger attacker. How can we believe that a smaller, weaker individual can physically defend themselves against a stronger attacker? Assailants don't believe it, bullies don't believe it, my bigger, stronger friends don't believe it, and many of our larger kenpo training partners don't believe it. People are getting overpowered and assaulted every day. Do we have to ignore reality and blindly believe that we could survive or even defeat our gargantuan attacker?

Fortunately, American Kenpo is based on science, the same universal laws that we know and rely on in our everyday lives. If you believe in the proven sciences, then you must believe in your ability to move, manipulate, and injure your attacker. While there's always more than one way to get the job done, "Creativity should be bound within the realm of true principles". Learning how to apply these principles with subtle refinements in movement will minimize the energy expended in some cases and is essential to the success of the small-fry in other cases.

Ideally, this paper is written for individuals who have some experience with kenpo for the purpose of making a believer out of someone. My hope is that this paper will help someone experience at least one moment where they discover that kenpo was designed for them regardless of the size of their opponent. With any luck, that one moment will encourage the practitioner to stay at it, explore further, refine their movement, and discover and create more of the subtle, sophisticated motion that makes kenpo work for us.

Obviously, it's frustrating and discouraging for the student of self defense to be overpowered by their attacker, but it can be quite frustrating as well for the self defense instructor who is unable to show the underdog how to make a technique work for them. Some of us have more small-fry moments than others. An advantage of being the small-fry is that you must learn to apply the principles well. If you have very few small-fry moments or if you are never the small-fry, create opportunities for yourself to train as the small-fry and see if your technique holds up outside of your comfort zone.

It can take a lifetime or many years to become a proficient martial artist if we ever achieve that status. The abundance of information can overwhelm and discourage. It's not my intent to regurgitate everything I've learned and read about kenpo and martial arts. By focusing on a few main items and bringing them together in one place, my intent is to keep it simple and create a reference for the small-fry so that they can try it, apply it in other areas, and start to believe. Brief, simple explanations are given for some of the scientific principles and how they apply to the martial arts. Some strategies are described along with how they can be used to overcome challenging moves in specific techniques.

TABLE OF CONTENTS

LIST OF FIGURES

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Santa Clara Kenpo Karate, my training partners, Nor Cal Kenpo, and AKTS

Chapter 1

INTRODUCTION

A female student with a purple belt that she earned at another school joined our studio to continue her training. After a couple months, a strong male student with a white belt in kenpo and a black belt in another martial art told her that kenpo techniques don't work in reality. He put her in an aggressive headlock and told her to do Grasp of Death. She struggled and fought and couldn't get loose, while he laughed and got a kick out of it. In the dressing room one night, she told a few of us this story, said that he was right, and that these techniques would never work for any of us. I asked her not to believe it, to come back so we could work on it. If I couldn't show her how to make a technique work for her, then I knew people who could. It was too late, she wouldn't continue her training.

I'm a skeptic by nature. Things have to be proven to me, shown to me, demonstrated, etc. I'm not saying that's the way to be. If I had experienced what she did when I had just started in kenpo, I may have said "Oh yeah, I'm screwed" and walked out the door. Who wants to learn self defense that doesn't work? With all the popularity of martial arts these days (competitions, tournaments, movies, sport, cardio programs, etc), sometimes attention is drawn away from the fact that we need to be able to defend ourselves in real situations. Many individuals are looking to the martial arts schools in an effort to become empowered to defend themselves against a real assault, many of them because they've already experienced an attack and felt helpless to protect themselves and their family. Individuals have a right to defend themselves and no one seeking the skills and knowledge to accomplish this should be turned away or pushed away because they can't keep up with a training regimen for 20 year old full contact fighters or because someone's ego won't allow them to train with girls.

By the title of this thesis you probably think that I'm being exclusive in my target reader; however, keep in mind that everyone is a small-fry relative to someone – it may be a larger opponent or just a stronger one. Author, gymnast, and martial artist Dan Millman says that our lives are simply made up of a series of moments. He says that there are no strictly intelligent people or strictly stupid people; it's just that some people have more intelligent moments than others. By the same token, some people have more small-fry moments than others. Mostly full time small-fries learn early on that out-muscling is rarely an option so they look for solutions, get frustrated and go home, or both (like myself – not necessarily in that order). Even if you are rarely or never the small-fry in technique line, it's important to be able to understand and communicate the concepts that will empower the relatively smaller and/or physically weaker student. Obviously, it's frustrating and discouraging for the student of self defense to be overpowered by their attacker, but it can be quite frustrating as well for the self defense instructor who is unable to show the underdog how to make a technique work for them.

It's important for the small-fry to believe that they can defend themselves against larger opponents; that they can move them, manipulate them, and injure them if necessary. The power of believing is immeasurable and while this sounds simple on the surface, the reality is that it's one of the most challenging tasks.

Whether you realize it or not, you believe in science or you wouldn't drive a car, fly on a plane, or even ride a bike. There are universal laws, principles, or concepts governing the flow of motion and forces that apply in sports, activities, and our everyday lives. If you believe in these laws, then you should believe that the small-fry can make kenpo work. These laws don't change so there's no

moving target or constant revisions to keep relearning. Whether we're learning a sport, doing yard work, or housework, we learn to apply these basic principles to the activity at hand. If we just want to have more fun participating in kenpo or we're concerned about being able to defend ourselves in real situations, then we need to learn how to apply these laws practically.

The kenpo practitioner who understands some basic principles of motion and forces and the mechanisms that transmit them understands that there are many efficient and effective ways of executing a technique.

My hope is that this paper will help someone experience at least one moment where they believe and that moment will make them think and manufacture more moments.

Chapter 2

NEED-TO-KNOW PHYSICS

Don't worry, I'm not going to derive a bunch of equations and make you solve word problems. As soon as you saw "physics", your eyes probably glazed over and you started drooling on your shirt. That is, after you thought "What the heck!? I just want to be able to hit somebody and defend myself, not launch shuttles into space" (although, that could be fun too).

Kenpo, in part, is a study of motion and forces. Recognizing that there are proven scientific principles, or universal laws that you can't change, defining motion and forces and these principles apply everywhere, generally speaking, should be enough to nudge you in the direction of believing that kenpo "works".

I tend to be more interested in the practical application of principles and equations rather than theory and how equations are derived. No matter how much theorizing and analyzing you do ahead of time, you still need to test things out. In engineering, some equations will only get you within ± 30% of your answer. That doesn't sound very precise, but it gives you a starting point. Then you need to get hands-on, test, and tweak until it works.

Of course there is a lot more to everything that I'll be describing here. There's more terminology and branches of study that break down into more and more branches. Individuals can spend their lives and careers studying one small branch. My purpose here is to simplify and not get bogged down with too much information that distracts and overwhelms. Although all of these things (and more) come together and work as a system, in order to analyze, understand and apply these principles, we must look at them in pieces, just as we learn basics or the alphabet. We learn in steps and build off of a foundation.

See Appendix A for some equations.

MECHANISM:

Description: A mechanism is a mechanical system made up of links (or bars) and joints capable of transmitting motion and forces. In martial arts, you are the mechanism. We cannot apply a simple equation using an individual's weight and come up with how hard they can hit. Every individual is unique and the efficiency with which you can transmit motion and forces relates to the efficiency, quality, and health of your mechanism. Don't get discouraged by that just yet.

Weak or injured areas in the mechanism will give when attempting to deliver the force. For example, the side kick can be a powerful kick if you use your body mechanics effectively; however, some people may have problems with the hip joint where the compression of the joint on impact of the side kick causes pain, weakness, and/or a loss of control of the muscles. This will prevent penetration of the kick and the leg can drop rather than return, taking away from the force of the kick.

While others can guide you and give you good ideas for tailoring the movement, ultimately you have to discover how to use your mechanism most effectively.

While it's important to take care of ourselves, maintain our health and conditioning, it's not practical to hoard self-defense for the elite athletes. Generally, if there's an appropriate balance in our everyday lives, we'll never be in our top condition or even maintain the same condition throughout our lives. Even if we do reach our top condition, many others will be stronger and bigger than us without being "in shape". Take care of yourself, but accept your mechanism. Work

with it and don't rely on overpowering your attacker. Like it or not, self defense is an everyday part of your life, not just when you're healthy or young.

The human body is a sophisticated mechanism, that not only allows us to move in three dimensions, but lets us choose to lock the links in place and move as one piece or let the links move separately. This ability to fuse and release from one move to the next in three dimensions allows for creative movement and transfer of forces. Possible rotations and translations depend on constraints of the joints between links. For example, the shoulder joint has more play than the elbow joint.

It can take time to be able to move ourselves in all the sophisticated ways that are possible. Fortunately there's more than one way to get the job done, so you can still be effective with simpler or alternate movement, while you continue to work on being able to move your body in ways that will minimize your effort while getting maximum results.

Motion and forces are analyzed by breaking them down into simpler components. The vertical and horizontal components of the motion can be analyzed separately to help our understanding of complex or sophisticated movement.

Importance: This is your tool for delivering all strikes. Protect it. You don't get another one. Don't sacrifice it to deliver that one all-powerful strike. You still have to be able to defend yourself tomorrow. (Of course there are scenarios in defending yourself where you may have to accept severe injury in order to save your life, but train with protection and power, not power only).

Strategies: All

CONTROL SYSTEM:

Of course we're not just made up of rigid links and joints to form a simple mechanism. We are also made up of a very sophisticated and complex control system, including the brain, nerves, soft tissue, muscles, chemicals/fluids, electricity, and energy among other things. The power stemming from these intangible, complex interactions can not be readily calculated or modeled. A part of this unknown or mystery factor is sometimes simply coined as heart or spirit. The complexity and uniqueness of the total mechanism makes it impossible to model completely and calculate its capabilities. Individuals would need to be instrumented and tested (and they have been) to measure the actual forces and motion that they are capable of, and it would vary under different circumstances. Even simple mechanisms that are modeled on a computer are built and tested, and then the actual results are compared to the model which is tweaked with a "fudge factor" so that it can better reflect reality (under a specific set of conditions).

Understanding more about your control system and complete mechanism can help you tailor, adapt, and develop your skills and your attitude for optimum performance. Everyone is uniquely wired and our feedback loops are different. Understanding and developing your strengths, while managing your weaknesses, is a good formula for success.

Left Brain/Right Brain Dominance:

The two hemispheres of the brain have different functions and, although both sides communicate with each other and we use both sides, we are all either left or right brain dominant. Neither type is superior or more successful than the other, but each type processes information differently. Because a certain amount of tension is necessary for personal growth, it is not desirable for the hemispheres to be perfectly balanced; however, the extremes can be unhealthy and detrimental. Understanding some of the general characteristics and value of the two types can help with

learning, teaching, communication, and harmony. For more detailed information and tests to determine your dominant side, refer to Right Brain Left Brain Reflexology.

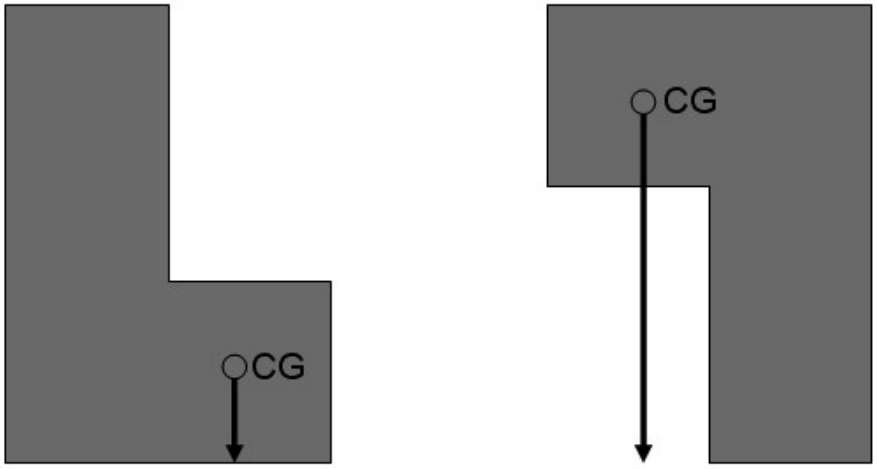
The table in Appendix B lists some characteristics of left and right brain dominant individuals and some functions of the left and right brain. You may see characteristics of yourself and/or others in the list and identify sources of confusion, miscommunication, and impatience. Hopefully recognizing that we're wired differently and that each way of thinking is valuable and necessary will lead to patience, understanding, appreciation, and awareness of the value in others and ourselves.

Neuron links are created early on as children. Once we reach a certain age, we don't generally create new links. We're all wired differently, which makes each person unique. While we can still learn new things, we can't change how we're wired. Each person has their own talents that have potential to be developed into strengths.

BALANCE:

Description: Your center of gravity (CG) is a point location through which your entire weight can be considered to act for the purpose of studying motion. It can be thought of as your balance point around which all of your weight is equally distributed. For symmetrical objects this point would be in the center. For irregularly shaped objects (like ourselves) the center of gravity tends to be towards the heaviest end. Dolly Parton's CG would fall higher on her torso whereas J-Lo's might be low.

An object is stable if a line drawn straight down from its CG falls within the foundation of that object. It is unstable if the line falls outside of its foundation.



More stability means less mobility. The more maneuverability designed into an aircraft, the less stable it is. If the aircraft is too maneuverable, the pilot may not be able to control it. Unfortunately we can't have maximum stability and maximum mobility at the same time; therefore, we need to strike a balance (so to speak) between the two.

The wider the base, the higher the CG must be raised to make it top heavy and tip over. In grappling, keeping a wide base and low CG will make it difficult for your opponent to throw you

off, even with a size and strength advantage. A narrow base and high CG will make it easier for your opponent to throw you, or you them.

Importance: In Martial arts, we not only need to maintain our balance while striking and maneuvering, but we need to be able to regain our balance quickly or move our foundation back under our CG. We also want to prevent our opponents from regaining their balance, or keep them from getting their feet back under their CG. When attached to your opponent, the system acts as one piece, CGs combine. We need to learn when to attach ourselves to our opponent and when to release for throws and takedowns.

Strategies: Balance manipulation, leg checks, surprise/shock, controlling impulse, borrowed force, keep the technique close to your CG, explosiveness

FORCE:

Description: A force is any action or influence that accelerates an object or distorts something. At a comprehensive level, a force is just a push or a pull. A force has magnitude (size) and direction. Generally, several forces act on an object at once. Forces can be added together or combined giving a net force (resultant force) that can be used to predict the subsequent behavior of the object. Arrows (vectors) can be used to represent items that have size and direction, where the length of the arrow represents the size of the item; however, the arrows shown in the figures of this thesis are symbolic only to help visualize and simplify components of forces and motion. They do not accurately represent magnitude. Forces (and other items that have both size and direction) are often analyzed by breaking them into horizontal and vertical components. Weight is a force that is always acting vertically downward.

Importance: Breaking down the resultant forces in our techniques into horizontal and vertical elements can aid us in visualizing where the components are originating from, whether each component is maximizing the resultant force or taking away from it, and figure out why we may not be getting the results that we're expecting. We can analyze in either direction, by looking at the results (the reaction of our opponent) and working backwards, or by looking at the components of the resultant first and predicting the reaction of our opponent.

Strategies: All

ACCELERATION:

Description: Acceleration is the rate at which velocity changes. Since velocity is defined as the speed and direction, acceleration takes place whenever you are speeding up, slowing down, or changing direction. Acceleration is a change in velocity and/or direction. The heavier the object, the more energy and/or force is needed to accelerate it. Acceleration has magnitude and direction.

Importance: A force is needed to create acceleration. More acceleration in the right direction equals more power in your strikes. A technique that can't accelerate lacks power. Accelerate the strike so that the fastest speed happens at the moment of impact. The faster you can accelerate in the direction of your strike, the more power you will produce. To create power, the smaller fighter must understand why and how objects accelerate. Remember that there are two different forces – a force is needed to initiate acceleration, which then contributes to the force of your strike. In this way the forces and motion feed off of each other and build power in our combinations.

Strategies: Explosiveness, use external forces, eliminate stop/start, leg checks, opposing forces, use external forces, controlling impulse, move offline

DIRECTION:

Description: As described above, force and acceleration don't exist without direction. Just any direction will not do. Your energy or efforts must be focused in the right direction(s), not necessarily the same direction, to optimize your power and achieve the desired outcome.

Importance: If some or all of your body mechanics, movement, or focus is in a direction that takes away from the power of your strikes, then energy can be wasted and you may not achieve the desired outcome (unless, of course, the movement was defensive and the choice was made to give up some power to ensure protection). There's never an always.

Strategies: Explosiveness, opposing forces, use external forces, move offline, leg checks, balance manipulation, controlling impulse, soft touch, borrowed force, isolate the head

EQUAL AND OPPOSITE FORCES:
Description: An object experiences a force because it is interacting with some other object. The force that object 1 exerts on object 2 must be of the same magnitude but in the opposite direction as the force that object 2 exerts on object 1. Or simply, for every force there's an equal and opposite force.

Importance: If I punch a wall with all my might, I'm not going to be too happy. Why? Because it's hitting me back just as hard. You've experienced this knocking knees with your opponent when you're throwing kicks, or hurting yourself when you're throwing an inward block. Whenever you hit, you get hit back. Whether it hurts or not depends on how the force is getting absorbed by you and your target.

Strategies: stronger tools against weaker targets, explosiveness, move offline, borrowed force, use external forces, controlling impulse, opposing forces, leg checks

ANGULAR MOMENTUM:
Description: The angular momentum of a rotating object depends on its speed of rotation, its mass, and the distance of the mass from the axis.

Importance: Extending your limbs away from your axis of rotation on spinning techniques will impede your motion and take away from the power of your strike.

Strategies: keep the technique close to your CG, use your hips, opposing forces

INERTIA:
Description: Inertia is resistance to motion. The heavier the object, the more resistant it is to being set in motion.

Importance: In order for us to start something in motion, we have to overcome inertia. A force must be applied and energy must be expended to set ourselves in motion or move our opponents. Every time we stop our motion, we have to expend energy to start ourselves in motion again. Sometimes you want to stop or interrupt your opponent's motion so that they must expend energy to start themselves in motion again. Other times we want to keep our opponent in motion to borrow or use their force against them.

Rotational inertia will increase if our limbs are far away from our axis of rotation. Keeping our limbs away from our axis of rotation on spinning moves or techniques will slow down our rotation, therefore taking away from the power of the strike.

Strategies: Eliminate stop/start, keep the technique close to your CG, balance manipulation, borrowed force

MOMENTUM:
Description: Momentum is a combination of mass and velocity. The heavier the object and the faster it travels, the greater the momentum. Momentum has magnitude and direction.

Importance: Getting your body mass behind all strikes and manipulations will optimize your momentum. Momentum is typically used to move someone through a distance.

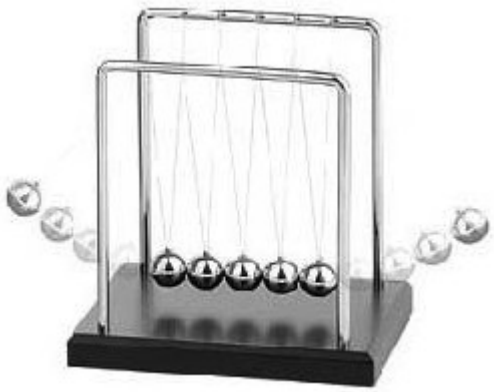
Strategies: stronger tools against weaker targets, move offline, borrowed force, balance manipulation, use external forces, controlling impulse, explosiveness

IMPULSE:
Description: Impulse is a change in momentum which is related to the force and the time of contact. Impulse involves how quickly the momentum comes to a stop. This relation tells us some things we can do to increase our force when striking, things we can do to decrease the force when defending against our opponents' strikes, as well as how to fall without getting injured.

Importance: Decreasing the time of contact when striking will increase the force. Increasing the time of contact when defending or falling will decrease the force. A large change in momentum quickly will increase the force. Aiming your strike "through" the target or a couple inches deeper than the surface will aid in the return of your strike quickly and cause more damage. Force is increased by reversing the momentum with speed and snap. Force is also increased by slamming your opponent into the ground or striking a body part that is in contact with the ground (sandwiching).

Strategies: controlling impulse, use external forces, explosiveness, leg checks, borrowed force

KINETIC ENERGY:
Description: Kinetic energy is the energy of an object resulting from its motion. Kinetic energy is a combination of mass and velocity; however, velocity has significantly more influence than mass in this case. Kinetic energy has magnitude and direction (I keep repeating this to emphasize how important direction is in generating power, manipulating our opponents, and in all aspects of martial arts). Kinetic energy needs a medium to travel through. Newton's Cradle, a toy used to demonstrate some laws of physics, shows how kinetic energy can travel through a medium. Dropping a ball on one end generates kinetic energy that travels through the balls in the middle, but causes only the ball on the opposite end to move.



Newton's Cradle

Importance: Kinetic energy is used to cause damage rather than to move someone. Fast, explosive movement transmitted through a small contact area causes damage. Small increases in velocity have a greater influence than small increases in mass. This is one reason why small-fry strategies do not include gaining weight, unfortunately, so put down that extra slice of pie and work on your speed instead.

In general, heavier fighters are thought to be slower than lightweights; therefore, what a fighter is lacking in mass is made up for with speed. Part of the theory being that heavier individuals have more inertia to overcome to put themselves in motion, which takes more energy. My observation has been that many larger opponents can also be faster than their lighter counterparts. There are

many other factors, besides overcoming inertia, that are internal to the mechanism (you) that affect speed. Don't depend on your gargantuan attacker being slower than you. Focus on what you can optimize about yourself. Just because your opponent might be bigger and faster doesn't mean that you can't hit effectively and do some damage.

Strategies: explosiveness, controlling impulse, control surface area or contact area, stronger tools against weaker targets

PRESSURE:
Description: Pressure is a function of a force and the surface area over which the force acts. If the force increases and/or the area over which it acts decreases, then we feel more pressure.

Importance: If you have less force available, you can reduce the contact area of your strike to do more damage. If you're falling, you can increase your surface area that makes contact to distribute the force and reduce the pressure. You can lay down on a bed of nails and have someone break a watermelon with a sledge hammer on your belly without injury, but the results would be different if you were laying on one nail.

Strategies: control weapon surface area or contact area

TORQUE:
Description: A rotating or turning force that acts at an axis or joint. A linear force applied to a lever arm at a 90 degree angle (for best results) creates torque at the axis or joint. The longer the lever arm, the greater the torque. A lug wrench for changing tires is a simple example of this. A long handle allows you to apply force at the end of a long lever which creates torque to loosen or tighten the lug nut. This type of lug wrench can also be used as a pry bar. A T-handle can also be used, which allows the user to push on one end of the handle, while pulling on the other.

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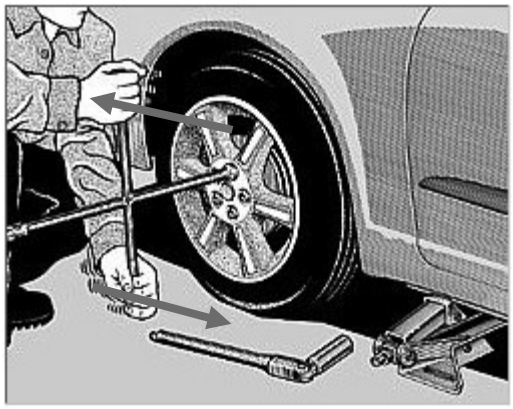


Torque being applied to lug nut

Importance: The idea is to use a longer lever arm, not more force. This allows you to do more damage with less force and conserve energy. While not always possible, the force should be applied at a 90 degree angle (perpendicular) to the lever arm for optimal results.

Strategies: opposing forces, keep technique close to your CG, leg checks, use your hips, borrowed force

WORK:
Description: Work is a measure of a transfer of energy or a force moving an object through a distance. No work is done if the force doesn't cause the object to move. Work is independent of time, so technically if the force and distance that the object is moved stays the same, then the same amount of work is done whether it takes an hour to move the object or a minute.

Importance: Decreasing the distance through which you move your weapon will decrease the amount of work and energy expended. Decreasing the internal forces used to move your weapons will decrease the amount of work and energy expended. Remember that there are two different works. There is the work of moving your weapons and then there is the work of moving your opponent.

Strategies: use external forces, borrowed force

POWER:
Description: Power is a measure of the rate of doing work or transferring energy. Increasing the amount of work done and/or reducing the amount of time it takes to do it will increase power. Work has to be done to get power.

Importance: It seems like a contradiction that we want to reduce the amount of work to conserve energy, yet more work means more power. We can do less work and just do it faster to increase power. Better yet, since the only energy we care about conserving is our own, we can have someone or something else do most of the work for us.

Strategies: use external forces, borrowed force, explosiveness

SUMMARY:
We control the way our bodies move with our muscles (among other things) and we often end up restricting ourselves. Understanding why and how power and acceleration happen will help us to start allowing the motion to happen. If I don't understand that chambering my elbow back will help accelerate my inward block forward, then I'm likely to control the motions independently of each other using my muscle strength or internal forces. If I don't understand rebounding or equal and opposite forces, then I'm likely to stop my front kick and return it using my muscle strength (internal forces) rather than trying to feel my target hitting me back and aiding the return. If I don't understand why and how to get my body weight and structure behind my strikes and manipulations, then I might only be using my hand strength or my arms and I'll feel frustrated and defeated against bigger or stronger opponents. If we don't believe that we can be effective and survive against a bigger opponent, then we will surely fail. Delusional or ignorant arrogance may give us false confidence, but it won't make us effective. Understanding the principles allows us to become self correcting in our movement as well as come up with, or at least recognize, multiple effective solutions to the same problem.

Chapter 3

STRATEGIES

When studying principles and strategies and how to apply them, consider them from other perspectives as well. Consider how you would prevent your opponent from applying the principles and strategies on you (not just the ones discussed in this paper). If you allow your opponent to use these principles (whether intentionally or unintentionally), how might you turn it to your advantage?

Again, it's difficult to talk about one subject without bringing in the others as they all are interrelated, but breaking down systems into smaller parts and studying the pieces can simplify things and help us have a deeper understanding of the whole system once we start putting the pieces together.

EXPLOSIVENESS:

We learn to slowly apply force in certain moves in our techniques because we're trying not to injure each other when we train. In reality, applying the technique suddenly and dynamically will generate the power that the small-fry needs to move, injure, break, or defend. Continually remind yourself of how you would actually apply the technique in a realistic situation. Small-fries or beginners may not understand the impact of moving explosively through a very small distance. In many cases, this may be all you need to make it work.

If you're lucky enough to have an instructor or training partner who enjoys pain, he/she might let you practice being more explosive so that you can see the effects. If your instructor also enjoys giving, you might get to feel what you're dishing out and that will help make a believer out of you.

Applying leverage explosively with fulcrums at joints can cause serious injury (which is why we do it for self defense) so we need to protect our training partners by slowing down and allowing them to move where we're putting them or tap out. Controlling the action in this way can cause you to use more muscle strength than you would need if you were accelerating.

Letting your weight drop suddenly when settling into stances, rather than controlling the decent with your leg muscles, can give you just the power you need to stop, move, and manipulate your opponent. Dropping suddenly just a couple inches into a neutral bow with your blocks, checks, and strikes can be practiced without injury so that you can see the effects on larger opponents.

Launching, or pushing off the floor with your feet explosively will generate power for your strikes.

If you feel like you're moving appropriately in the right directions but it's not quite working for you, try adding a little explosiveness and see if that gets you the results you were hoping for.

OPPOSING FORCES:

<u>LEVERAGE AND PUSH-PULL</u>:

Lever/fulcrum:

A lever is a rigid object that is used with a fulcrum to amplify the mechanical force that can be applied to another object. A fulcrum is a pivot or the point or support around which a lever turns. There are different classes of levers, but for simplicity I'm only discussing the class 1 lever (figure 1) in which the fulcrum is located between the input effort and the output load. In use, a force (the input effort) is applied (by pulling or pushing) to a section of the bar, which causes the bar to rotate

around the fulcrum, overcoming the resistance force (output load) on the opposite side of the fulcrum. Varying the distances between the input force and the fulcrum and between the load and the fulcrum, the amount of effort needed to move the load can be decreased, making the job easier.

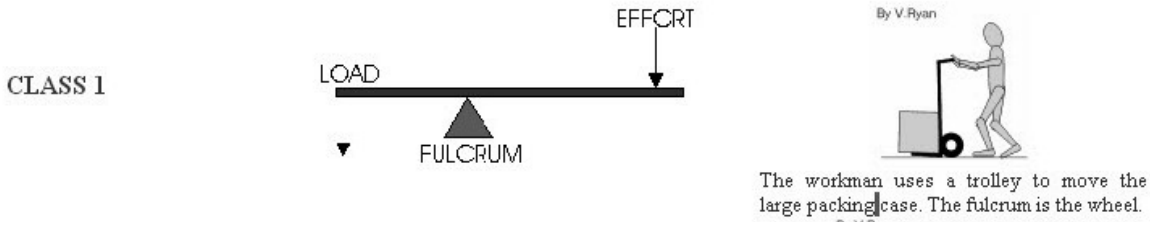


Figure 1, Class 1 Lever

Fulcrums can be attached or unattached to the lever or bar and can be located at the ends of the bar or anywhere in between.

Looking at the workman in figure 1 above, you can see that he is made up of a number of levers and fulcrums. His joints (shoulder, elbow, wrist, knuckles, hip, knees, ankles, neck) are attached fulcrums. Forearms, hands, fingers, upper arms, shins, feet, thighs, head, etc. are levers. As we interact with our opponents, there is a whole system of levers and fulcrums in operation.

If you think of your opponent's body as the output load and his/her arm as the bar, you can see how we often apply a fulcrum at the elbow with our forearm, while our wrist grab is the input effort. Crossing Talon, Grasp of Death, Glancing Salute, Gift of Destruction, Snapping Twig and many others are examples.

The external fulcrum that we apply is not always static. Sometimes we're hitting with the fulcrum, like in our techniques with arm breaks, hyperextensions, or getting our opponents on their toes. We can use our body as the fulcrum, our opponent's body, or objects.

The term push-pull sounds passive, static, inactive, inert, or not explosive. While push-pull doesn't always have to be applied dynamically (the static torque or leverage may be all you're after to hold or manipulate your attacker), thrust-yank might be a more descriptive term for many applications.

We may learn to apply the push in many cases, but it can be easy to forget to add the pull. Instead we often hold or pin on one side, then push on the other. For example, in Crossing Talon, my "attacker" kept insisting that I needed to push down harder on her elbow with my left forearm to get the arm bar. I couldn't push down any harder so instead I lightly pulled up on her wrist with my right hand, probably less than half an inch, and she did a face plant into the mat. Sometimes you don't realize the amplitude of the effect that a small, effortless adjustment can make.

Some joints have more play than others. For example the shoulder joint has more flexibility and can move in more directions than the elbow joint. Try moving your fulcrum to areas with less play if you're not getting the results you're looking for or if you're at the end of your range of motion. Also, some individuals are more flexible than others or are "double-jointed" so you may need to make adjustments such as pushing and pulling through a greater distance or applying the push-pull more explosively.

It's important to be aware that we are made up of levers and joints and we can easily inadvertently apply levers to ourselves, amplifying forces on ourselves, while attempting to use leverage on our opponents. Remember equal and opposite forces – when we're pushing, there's a force pushing back, when we're pulling, there's a force pulling back. Our positioning and body alignment should

be optimized so that our opponent's structure gives, not our own. As the small-fry, it's not likely that you will be able to make up for a self-imposed lever with muscle strength. You need your weight behind everything that you do and the proper structure to be able to transmit that load to your opponent. Don't spread your arms out to gain distance for torquing – that lessens the force that you are applying on the lever arm and causes torque on your joints instead.

Leverage is independent of speed or impact. Torque can be increased by inching slowly. However, if we take into account the internal workings of both our own and our opponent's mechanism, then we can see that applying the torque suddenly can cause a greater reaction partly due to eliminating the slow stretch of our opponents muscles and connective tissue and not giving them a chance to move and adjust. Applying torque slowly allows your opponent's mind and body to adjust and can require you to use your muscle strength for a longer time causing fatigue.

GENERATING VERTICAL ACCELERATION:

As mentioned earlier, motion and forces are often broken down into vertical and horizontal components to simplify calculations and our understanding. For a long time I was missing an important vertical element of opposing forces. I was standing up and reaching upward with my blocks and strikes trying to attack my opponent's weapon by pushing off the floor and lifting myself upward attempting to get my weight behind the blocks. My initial block on Lone Kimono had no affect on strong attackers. All it did was make my attacker tighten up even more so that it was more difficult for me to move them. It felt counter-intuitive to me to drop away from the target instead of trying to drive toward it and through it with all of my weight. Once I started dropping my weight into a neutral bow and allowing my block to accelerate up, I got better results with less effort. Getting your weight behind your strikes doesn't always mean moving it in the same direction as your strike. Now I'm trying to break my habit of standing up trying to make myself taller instead of bending my knees and dropping into a good neutral bow. Remember that practice makes permanent, not perfect.

In figure 2 you can see that dropping your weight not only accelerates your upward block, but it creates the input effort for a lever that gets your opponent on his toes.

Lifting her weight upward toward the target as she steps back forces her to use a lot of internal force (muscle strength), puts a lot of pressure on the shoulder joint, and she loses the explosiveness of the strike.

Dropping her weight suddenly as she steps back will assist the upward acceleration of her strike, generating more force with less effort/work/energy on her part.

Figure 2, Lone Kimono

In Crossing Talon (figure 3), drop your weight and let your elbow accelerate upward. Their weight has the lever anchored at their end. Pull their wrist to your right hip and let your weight be the input effort, hit them with the fulcrum at or above their elbow, and get them up on their toes as you push off the floor with your left foot as you step through.

Dropping her weight assists the upward acceleration of her elbow.

Figure 3, Crossing Talon

In Obstructing the Storm (figure 4) or Capturing the Storm, trying to launch yourself upward into the block can put you in a bad position. Simply stepping forward, dropping slightly into a neutral bow, and letting your arms accelerate into the block gets you out of the line of attack and positions you for the next move.

Launching her weight upward and standing up reaching with the block.

Stepping forward and dropping her weight into a neutral bow accelerates her block upward.

Figure 4, Obstructing the Storm

In Twisted Twig (figure 5), Entangled Wing, Bow of Compulsion, and other techniques with upward elbows, drop your weight and let your elbow accelerate up.

In Glancing Salute (figure 6) and other techniques with knees, make sure that you're pulling down and thrusting with your hips. You can also push off the floor with the knee strike.

Figure 5, Twisted Twig

Figure 6, Glancing Salute

Hopping, leaping, stomping, and chicken kicks can help generate vertical acceleration with opposing forces as well. In Squeezing the Peach and Wings of Silk, hopping and/or stomping drops your weight and can accelerate flip kicks and obscure elbow strikes. In Begging Hands,

letting the first kick drop can help accelerate the second kick upward. The small-fry can generate a lot of power with chicken kicks and hopping, but be aware that you may be vulnerable in the moment to losing your balance or to take downs because you don't have a strong base. Remain mobile and quickly get your base back under your CG if you lose your balance.

Standing up into a higher stance from a lower stance can also create an opposing force that accelerates downward strikes with counter-rotations.

KEEP THE TECHNIQUE CLOSE TO YOUR CG:

Keeping your elbows in, down, or anchored will help minimize the use of arm strength and get your weight behind the technique. Bring your arms in close to your trunk and keep your posture. Think of fusing your elbows, arms, and hands to your hips. The closer you keep the technique to your center of mass, the stronger you will appear to be.

On spinning techniques, keep the majority of your mass close to your center. This reduces the rotational inertia (resistance to motion) and speeds up your spin, which will increase your power. Anything sticking out from your center will resist the motion so keep your arms in tight on the spin and release the strike towards the end of your rotation. Keeping your arms in tight will also help protect you from your opponent's strikes.

Whether applying levers, fulcrums, locks, strikes, or moving your opponent, keeping the technique close to your CG will help engage your hips, use your backup mass, and minimize the use of your arm strength. This will also prevent you from creating a lever against yourself.

Figure 7, Spiraling Twig, illustrates how separating your arms from your center causes you to lose control of the technique and struggle to apply the wrist lock, while keeping your elbows anchored applying a fulcrum at your attacker's elbow can easily take him to the ground.

By lifting her elbow and extending her arms away from her CG, Mrs. Agonoy misses opportunities to use leverage, uses only hand and arm strength, and has little control of her attacker.

Keeping her elbows anchored and arms in close to her CG gets her weight and hips behind her action, optimizing the input effort or force she's applying to the levers against her opponent.

Figure 7, Spiraling Twig

Get your weight behind your wrist lock in Gift of Destiny (figure 8).

Mrs. Agonoy struggles to move Mr. Purvis when she separates her arms from her body and is using only hand and arm strength.

Mrs. Agonoy enjoys the control when she keeps her elbows in closer to her CG, gets her body weight behind the wrist lock, and drops her weight downward settling into her stance. You know what's coming next and she's in a much better position to deliver it.

Figure 8, Gift of Destiny

Lock the wrist and move your opponent with your hip rotation in Glancing Spear (figure 9) and Desperate Falcons (figure 10).

Figure 9, Glancing Spear

USE YOUR HIPS:

Think about hitting with your hips, not your arms. Try considering your arms as attachments, grips, or extensions of your hips. Apply the initial arm bar (inward block with outward block) in Glancing Salute (figure 6) or Flashing Mace with your hips.

Think of your hips as the drum in the drum rattle below and your arms are the strings with the weights on the ends. Rolling the stick back and forth between your hands rotates the drum and the

whipping action causes the weights to fly and pound the drum. Throw punches or strikes with your hips and let your arms relax. You can create a whipping action (like snapping a towel) by rotating your hips back and forth. Apply leverage by pushing and pulling with your hips.

Drum Rattle

BORROWED FORCE:

The gargantuan opponent's weight and strength should be used against him and we should avoid getting trapped or overpowered by it. Sometimes we have to use more gentle moves to accomplish this (soft touch).

When your opponent is in motion, whether they set themselves in motion or you set them in motion, create collisions using your stronger weapons against their weaker targets. Avoid direct collisions with hard targets or you'll end up hurting yourself. You don't always have to hit hard if you hit effectively. Make them do most of the work.

In Desperate Falcons (figure 10), set your opponent in motion with your hip rotation, then reverse your direction with your double punches using their forward motion against them. Similarly, reverse your direction in Glancing Spear (figure 9) with the elbow strike to the ribs while your opponent is still in motion from you pulling them forward. Look for or create opportunities to use their momentum against them.

Mrs. Agonoy folds her arms in close to her CG locking up Mr. Purvis' hands.

She rotates using her hips (not her arm strength) to set Mr. Purvis in motion.

She changes the direction of her rotation with subtle figure 8 hip movement to continue her motion and build acceleration for the collision.

Figure 10, Desperate Falcons

In Buckling Branch (figure 11), get your scoop kick in before their kicking leg hits the floor. Their weight dropping into a collision with your kick coming up will amplify the effect with no effort on your part. Essentially they'll be hitting themselves. Try to get your kicks and strikes in before their legs plant from their kicks. Swinging Pendulum and Circle of Doom are also good candidates for this.

Mrs. Agonoy misses an opportunity to let her attacker do the work for her.

Mrs. Agonoy creates a collision between her shin and Mr. Bernasconi's groin by timing her kick to land before his foot hits the ground. Ouch, that's gonna hurt!

Figure 11, Buckling Branch

Borrowing force doesn't always mean colliding with your opponent's momentum. In Leaping Crane (figure 12), use their forward momentum to help them to the ground. Parry the punch to keep your opponent in motion. The mid-knuckle strike bends them forward, still in motion but slightly redirected. Their right leg gets loaded up for your knife-edge kick that helps them to the ground. If you had stopped their motion with an inward block and/or a right punch instead of the raking mid-knuckle strike, then they would be able to regain their balance on their back leg, making your knife-edge kick more labored and not as effective. Sometimes "continuity of motion" means keeping your opponent in motion as well.

Parrying the punch keeps her attacker in motion, while the mid knuckle rake gets him to lean over.

She's positioned herself out of harm's way and redirected his momentum.

His CG is on its way past his base. Now she just has to attack his base and assist him to the ground.

Figure 12, Leaping Crane

LEG CHECKS:

Use your legs to attack and collapse your opponent's base. Let your weight drop suddenly into your leg checks. It should be relatively effortless. Buckling our opponents' legs and bringing down their height is a way for the small-fry to reach specific targets and control the technique. Strike soft targets with your knees, if possible, and use your shins as levers to collapse or break.

We often apply a soft check with our legs to prevent our opponents from kicking or moving their legs; or we miss the checks all together because we feel like we have to lean back to apply the blocks/strikes to the arms and the leg check is too far to reach (see figure 13).

Figure 13, Leaning back with the block

Don't maneuver your upper body around your opponent; keep your posture erect, weight going forward, drop your weight and go through them (figure 14). This will help you deliver your leg check.

Figure 14, Keeping weight forward with block

Dropping your weight quickly or explosively, even just a couple inches, generates a lot of power and doesn't take much effort. I do this when holding kicking shields for large partners – a subtle drop often prevents me from losing my balance (without having to shuffle my feet back under my CG) and gives them the resistance they need with the bag.

If your opponent is tall and you can't get an effective angle with the block, you don't want to absorb part of the blow, or you want to borrow the force of their forward motion, try substituting a parry.

Some of the more obvious leg checks that we apply are in Grasp and Grip of Death, Attacking Mace, Evading the Storm, Thundering Hammers, and Flashing Wings. Try inserting them into other techniques to bring down your opponent's height so that you can reach targets with effective strikes rather than trying to stand up taller and losing stability. In Sleeper a leg check can be used to reach and apply an effective choke (figure 15).

Figure 15, Leg Check in Sleeper

In Circling Destruction a leg check with the backfist to the ribs while pulling your opponent's arm to your waist can bring him/her in range for the left heel palm strike to the face and the right handsword to the neck (figure 16).

Figure 16, Backfist and handsword in Circling Destruction

In Leap of Death, apply the check with the backfist and arm pull to help start your opponent toward the ground as well as position his/her elbow for a good fulcrum for the throw (figure 17).

Figure 17, Backfist in Leap of Death

Collapse the leg in Destructive Kneel (figure 18) with the double punches or in Back Breaker (figure 19) to reach a good fulcrum under the chin.

Figure 18, Double punch in Destructive Kneel

Figure 19, Leg check in Back Breaker

USE STRONGER TOOLS AGAINST WEAKER TARGETS:

When someone has bruised, swollen, busted up knuckles and says they hit a board or a wall, a common razzing is "What happened, did it hit ya back?". The answer to that is "yes". Every time we hit, we're getting hit back. Even standing or walking, there's a force pushing up on the bottom of our feet. Hitting something flexible or soft increases the time of contact; therefore, reducing the force (impulse). We are not rigid or solid bodies. Although our skeletal bones can be considered relatively rigid, they are all connected with and surrounded by soft tissue. Forces are being transmitted and absorbed through this chain whether we are the ones hitting or being hit.

It becomes more obvious that we're getting hit back with the "equal and opposite force" when our shin makes contact with our opponent's shin, knee, hip, elbow, etc. A less obvious example is that when executing an inward block to the outside of a large attacker's straight punch, thrown realistically and powerfully, a common small-fry observation is that it can hurt us more than our attacker even though we're offline and not absorbing the full force of a direct collision.

Target areas that are weaker than your weapon and that can't be worked out or strengthened. You want the target to give not the weapon. The small-fry needs to be aware that even their bones, which are relatively rigid, are probably weaker and more flexible than the big-fry, so avoid direct collisions with hard targets.

<u>Eye pokes</u>:

It can be daunting to watch MMA/UFC full contact fights and get a sense of the brutality, aggressiveness, strength, and emotion that your attacker may have, and that's in a controlled

environment with rules. Then you go to martial arts class and look up at all the students and instructors and you're supposed to believe that you can defend yourself if one (or more) of these big bruisers actually went OJ on your ass? Right!

The one thing that always struck me as funny when watching the MMA fights is that after the two fighters have been brutalizing each other, they're bloody, swollen messes, they've hyper-extended joints, they've been beating each other in the head, and they never tapped out or quit they're assaults, but every time one of these warriors accidentally gets poked in the eye, they retreat, curl up, and quit fighting. Granted, one of the reasons they stop fighting is because eye pokes are against the rules, but that immediate reaction is telling. If we use stronger weapons against weaker targets, we can survive, defend, or defeat our assailants. Assaults and fighting are very dynamic and there are unknowns and many other things that factor into the outcome under any given scenario.

There are many opportunities to add eye pokes, strikes, gouges, etc to kenpo techniques. Adding them helps me to not only build "muscle memory" but remember that I'm practicing for self defense and survival and not for tournaments and competitions where I'm expecting my opponent to tap out and we're done.

Eye strikes are great tools to help you and your students believe; however, many people will not understand the significance because we don't deliberately strike each other in the eye when we're training and we don't see a real reaction. Point out to your students the MMA fights or other video where they can see the results of a real eye poke and point out opportunities to use them. We can feel helpless and panicky when we are overpowered and/or restrained. Sometimes something simple, like the eye strike, can be a great equalizer, but we get frustrated and think that karate doesn't work for us because in technique line our stronger opponents aren't reacting. Many of the strikes and moves that will work in reality for us, don't work in our training because some of the stronger students think it's funny to watch you try to get out of something, or they simply don't understand the real impact of the move that you applied and don't dummy accordingly. It can be frustrating because we don't want to have to really injure our training partners to escape.

There are many eye strikes already included in our base techniques; however, since we're not able to actually strike the eyes while training, we don't get to experience a real reaction. Sometimes the bigger or stronger opponent will overpower the small-fry maybe because they become complacent and don't dummy correctly, they don't understand the technique, they're not paying attention, forget, or they're just messing with you because they know you won't actually poke them in the eye (right?). This can be frustrating for the small-fry. If the positions were reversed, the stronger individual can continue to muscle their way through the technique, overpowering the attacker, regardless of the attacker's reaction to eye strikes. This is a source of misunderstanding and frustration for beginners, those who don't understand the principles, or those who simply haven't learned how to apply the principles. It's also a reason that students leave kenpo. Small-fries are often told that the techniques or certain moves won't work for them. Who wants to learn a self defense art that won't work for them?

Look for opportunities to insert eye strikes within techniques (there are many) or add them to your cover out. For example:

> Shield and Sword: After the right kick at the end of the base technique, ricochet your right forearm off of your attackers left bicep settling into a right two-finger poke as your right foot plants into a rear twist stance from your front crossover (see figure 20).

Figure 20, Adding eye strike to the end of Shield and Sword

Twirling Wings: From your left horizontal elbow strike (at the end of the base technique), contour or weave your left forearm over the top of your opponent's right arm simultaneously contour and turn your right checking outward parry into a wrist grab, pulling your opponent in the direction of your cover out (10:30). Settle into a left two-finger poke as you plant into a rear twist from the front crossover (see figure 21).

Figure 21, Adding eye strike to the end of Twirling Wings

Twisted Twig: Insert a left four-finger strike over your right shoulder with your right hammerfist to the groin (see figure 22).

Figure 22, Adding eye strike to the end of Twisted Twig

If you're concerned about your control, then use a fist instead of finger strikes at first. Notice that your opponent flinches, even when you're not making contact.

With the right training for "real" situations we can learn to keep fighting no matter what. After all, people have been shot through the eye, kept fighting and survived.

Pinching:

Grabbing and squeezing a handful of flesh is a great way to get your opponent to comply and help students start believing early on in their training. Whereas uncontrolled eye strikes can be more dangerous to practice, pinching can be inserted with less risk. It's unfortunate that some of the terms, like pinch, poke, hop, and prance, sound effeminate and weak; while others, like punch, kick, and strike, are powerful sounding words. Pinching can be a great equalizer for the small-fry.

Pinching, ripping, and scraping fleshy areas can be easily inserted into the techniques. The inner thighs, triceps, biceps, sides of the neck, pectorals, flesh around the ribs, groin, ears, and even cheeks can be effective areas to pinch. Again, pinching, squeezing and ripping are prominent in our techniques, such as Grasp of Death, Captured Twigs, Squeezing the Peach, Parting Wings, Glancing Spear, Destructive Fans, etc.

Pinch the inside of the thigh when checking your opponent's right knee with your left hand in Locking Horns (figure 23). Also grab the groin with your right hand and rip up with the obscure elbow after the underhand reverse handsword. You can either grab the groin after rotating your hand counterclockwise in preparation for the elbow, or grab the groin with the palm forward immediately after the handsword, then twist and rip.

Figure 23, Pinching in Locking Horns

Pinch your attacker's neck as you turn them in Dominating Circles (figure 24).

Figure 24, Dominating Circles

Instead of leveraging under the chin when behind your opponent such as in Back Breaker (figure 27) or in Fatal Cross, grab a fistful of their cheeks and pull into the knee strikes. From the front, instead of hooking the neck or grabbing the lapels, grab and rip the ears as you pull them into the

knee strikes, or grab and rip the ears on your way out after sandwiching elbows or hand swords to the neck.

If their hands and wrists are too big on techniques where you need to grab and pull or apply locks, try grabbing their fingers instead.

ISOLATE THE HEAD:

"Where the head goes, the body will follow". We've all heard this expression in self defense. Manipulating the head can help us gain control of our opponent. There are many vulnerable areas of the head that cannot be worked out to make them stronger and the head doesn't have much mass. It can usually be manipulated with little effort or force to knock your opponent off balance or move their CG, cause pain, injury and reaction, cause blips in their control system or even unconsciousness. The head is often not readily accessible to the small-fry, so other methods must be employed to make it reachable. Depending on the scenario, the head of the small-fry can be much more accessible to the larger opponent so great care must be taken to protect it.

Heel palm strikes to the head can be used to stretch out your opponent in Grip of Death (figure 25) and Locked Wing (figure 26) and can be practiced without injury. Emphasize these strikes in your techniques to create levers and move your opponent's CG to upset their balance.

Figure 25, Grip of Death, palm strike to the head

Figure 26, Locked Wing, palm strike to the head

Leverage under the chin for better control when behind your opponent such as in Back Breaker (figure 27) or Fatal Cross. Again, as the small-fry you will need to create opportunities to reach the head by using leg checks, buckling the legs with knee strikes or kicks, or striking the groin (figure 35), for example.

Figure 27, Control of the head in Back Breaker

You can get an opponent's head to turn by pushing up under the nose in Dominating Circles or Fatal Cross. This is a sensitive area so it doesn't take much force to get their head to move where you want it.

USE EXTERNAL FORCES:

It takes force to generate force. We need forces to set ourselves in motion or create acceleration for our striking forces. Defining internal forces as our muscle strength, in order to conserve energy we need to minimize the use of these internal forces. More importantly, as the small-fry we cannot rely on these internal forces to defend ourselves or make the techniques work against bigger, stronger opponents. The stronger individual will be able to get themselves out of sticky situations and make the technique work for them by overpowering or out-muscling the attacker. By definition, the small-fry cannot.

Look for the external forces to assist, generate, and amplify your power. Your weight is an external force. Don't fight against it, use it. Let it drop when striking. Let it assist your rolls and regaining balance.

When we hit, we're getting hit back. Let the target hit you back and assist the return of your weapon and acceleration into another strike. When we throw a roundhouse kick into the air, we use our muscles to pull it back so that we can keep our balance. When we kick a bag or other target, it's much easier to return the kick and keep our balance. In order to take advantage of these external forces, it's important to get penetration into the target first, then relax at the right time to let the target assist in the return or rebound of your strike. In Lone Kimono (figure 2), after getting the penetration on the initial upward block, let the opposite force return your weapon and feed the next strike. You can also use a component of the external force to ricochet or redirect your initial strike into another, rather than return it along the same path. Some people have a natural talent for moving, going with the forces, relaxing and tightening up at the right times. Others need to understand the concept, otherwise they won't allow their bodies to move this way and develop a feel for how to take advantage of the flow of forces and motion.

Launching or pushing off of the floor, wall, or other objects will also assist the acceleration or power of our strikes. Think of it as rebounding off the floor. When you step back on techniques, think of loading up your leg with your weight and explosively pushing off the floor on the balls of your feet to come forward with the next strikes. For example in Buckling Branch, Thrusting Salute, and Flashing Mace after the initial blocks stepping back, push off the floor with your back foot as you step through with the next strikes. In Darting Mace (figure 28), push off with your back foot as you step through with the next sequence of strikes. Continue to run through your opponent, knocking them backwards.

Fig 28, Darting Mace

A common frustration among small-fries is that sometimes they end up bouncing off of their opponents when they intended to move them or go through them. We will not always get the reaction we expect from our opponent. We may not execute the move properly every time, but also every opponent is different and may react differently even if you execute the strike well. It's okay if you inadvertently bounce off your opponent. Just remain mobile, go with that external force and use it to keep your balance, move offline, or feed your next strike.

Of course our opponent's weight, motion, and attacks are external forces that we can use as well, as discussed in the Borrowed Force section.

BALANCE MANIPULATION:

A lot of what we do in our techniques is about upsetting our opponent's balance while trying to maintain our own. Whether we leave them on the ground with a takedown or cover out with them still standing, we've likely done something to manipulate their balance during the technique. In order to upset an attacker's balance we need to influence their CG or their foundation or both.

Disrupt the attacker's base by kicking, kneeing, or sweeping their legs apart as in Glancing Spear (figure 9), Destructive Fans, and Dance of Darkness. We can check or pin their legs to prevent them from stepping and getting their foundation back under their CG as in Crashing Wings, Sleeper, or Falling Falcon. Go through them, take their position away from them, collapse their base. There are numerous examples, but the point is to attack and control their foundation. Sweep their legs during your cover outs.

In Obscure Sword, we use deception (purposeful defiance, then compliance) to get them off balance stumbling backwards as we deliver a handsword and kick to finish the job. Get them to commit to their motion, then go with it (borrowed force).

Move their CG outside of their foundation by manipulating the head as discussed previously. It's easier to move and control their head than to try to move their full weight.

Stretch them out by shuffling when you step in Spiraling Twig (figure 29), Flight to Freedom (figure 30), Glancing Spear (figure 9), and others. Get them to step. Create levers. Go after the vulnerable areas that are easy to influence, their CG will follow.

Fig 29, Spiraling Twig

Fig 30, Flight to Freedom

Surprise or shock value can disrupt your opponents balance as well.

If you find yourself leaning back losing your balance, remain mobile and shuffle or slide your feet back underneath yourself. If your opponent doesn't move like you expect, then move yourself around him. In Five Swords stepping forward with double inward blocks to the inside of the roundhouse punch, you may find that your CG gets knocked back when you collide with the punch. Again, don't keep your feet glued to the floor, just move with it. Instead of just stepping in with a horizontal force against your opponent's roundhouse punch, keep your elbows fused to your

hips, drop your weight suddenly into your neutral bow adding that vertical component to your block, and check the leg. Focus your energy toward the ground and attack the weakest end of the punch toward the shoulder, not the fastest and most powerful end of the punch. All of these things should prevent you from leaning back or getting knocked back with your blocks.

CONTROLLING IMPULSE:

Change up the time of contact of the strikes with the target to increase or decrease the force depending on what you are trying to accomplish. Decreasing the time of contact, or increasing the change in momentum, increases the force. Snapping back your strikes can increase the force or damage to your opponent, but only if you get penetration first. Without much penetration, you can still get a stinging effect.

Thrusting impact will increase your time of contact and can be used to move your opponent. It becomes more of a push the longer you keep in contact.

Defensively we can roll with the punches to increase the time of impact and reduce the force that we're feeling. If we try to relax, feel the initial contact of the strike, and move the target away (in the same direction of the incoming force), then we can minimize the damage. If we tighten up and stop our head from moving, we're increasing the force that we'll absorb.

This is why sandwiching is so beneficial. Preventing our opponent's head from moving away from our elbow strike by hooking or using a heel palm strike on the opposite side will increase the force. Also pulling them into the strike will create a collision. Look for opportunities to have a backstop preventing your opponent from rolling with the strikes. The floor is a great backstop when dropping our knees (or other strikes) onto their head or other targets after a takedown. It's also great for stomping or directing our strikes at a downward angle to sandwich our opponent between the floor and our strikes.

SOFT TOUCH:

Don't underestimate the power of a soft touch. We get caught up in trying to figure out how to hit harder and optimize the power in our strikes. Everyone wants to teach the small-fry to hit hard and harder and squeeze every bit of power and strength out of you to make it all work. It's exhausting. While it's true that there will be scenarios where you have to use all of your strength and energy to survive, the small-fry cannot depend on brute strength. In many cases, once you tighten up or start hitting, it will cause your opponent to tighten up and apply their attacks more aggressively using their superior muscle strength. Accept and embrace the small-fryness in yourself and think about working smarter not harder. You don't need to hit harder, you need to be effective.

In Dominating Circles (figure 31), sometimes pinning the hand aggressively and striking under the elbow can cause your opponent to tighten up and apply the grab more assertively, impeding your motion and causing you to struggle. Try using a softer touch or parrying motion. As you pin with your left hand use a right outward parry to the outside of their arm before you come over the top with the right elbow collapsing their arm. A lighter touch can deflect them off of you and set them up for the next moves.

Fig 31, Dominating Circles

In Circle of Doom (figure 32) or Rotating Destruction, it can be difficult to maneuver the opponent's kick. If we hit the leg with a right inside downward palm down block on the first move, then we have to overcome the force created by that strike to try to change the direction with a right extended outward block. Think of the first moves more as parries where you simply want to softly redirect the kick. You still need to get out of the way rotating into a reverse bow, but start with more of a soft inside downward palm down parry, circling your right hand up to cradle the ankle in the crook of your elbow, then change the direction using your hip rotation and continue the parry just to get them off of you. Keep your elbow anchored, keeping the technique close to your CG, and use your hips to do the work. Of course, get your right stiff-leg lifting back kick to their groin before their leg plants to the ground.

Fig 32, Circle of Doom

If we make every strike a major one, we might defeat ourselves. A minor strike can distract, startle, create a moment for us to react with a major strike, or get our opponent off balance for a moment. Sometimes if you try to make a minor strike a major one, then you might over commit and emphasize power only rather than power and protection. If you put everything into power, then you might still get injured or killed by not protecting. A small-fry can't afford to do this and take the blows of a more powerful opponent – we need to be able to keep fighting.

ELIMINATE STOP/START:

Moving back and forth along a straight line requires that we stop moving in one direction and start our motion again in the opposite direction. Similarly, changing directions around sharp corners requires stopping and restarting. Circular motion will eliminate the stop/starts in your techniques. Replace straight lines and large circular motions with elongated figure eights wherever possible to eliminate the stop/start and prevent large gaps in your defense.

A combination is not just a series of strikes thrown in succession. A combination requires continuity of motion so that each strike feeds the next, building acceleration and generating more power for each blow. Throwing many single strikes requires that you keep starting and stopping which causes you to continually overcome inertia. Think of every move as part of the combination rather than just the strikes.

Use elongated figure eights in your hip movement and weapon movement when changing directions with your strikes and throwing combinations. Move in figure eights when rolling off punches and use the acceleration from turning the bend to come back in with a counter strike. If you watch a kick boxer with good head movement, you'll start seeing many areas with relaxed figure eight movement as they roll off punches and accelerate into their strikes. Hips, torso, arms, shoulders, and weapons all move harmoniously and fill three dimensions. They don't just move in horizontal, vertical, or 45 degree planes.

Relaxing your muscles also allows you to move continuously, feel the external forces and take advantage of them. Round off the corners in your movement to be able to keep moving and build acceleration. This is a lot easier said than done – first you have to find all the sharp corners. They're not always easy to recognize.

Remember that continuity of motion can be about keeping your opponent in motion as well so that you can borrow those forces and use them to your advantage. You don't want to keep stopping your opponent's motion in Leaping Crane and have to overcome their inertia to set them in motion again.

CONTROL WEAPON SURFACE AREA OR CONTACT AREA:

If you're in close or space is confined and you don't have the distance to accelerate your strike, consider reducing the surface area of your weapon for a greater impact. Use the point of your elbow, your knees, a mid-knuckle strike, your fingers, or other weapons with a smaller contact area to focus the force. Using a larger contact area will distribute the load (which we often do in technique line to protect our training partners).

When we fall, we try to increase the surface area of our body that contacts the ground so that the force is distributed and we don't feel the full effect. If we fell with all our weight getting transmitted through our elbow or wrist, then we would be injured. Rolling actually increases the time of contact which reduces the force that we feel.

When our heart rates increase due to fear, we lose motor skills and probably won't be able to hit small targets precisely with small weapons. When your opponent is moving and fighting back

coupled with your adrenalin rush and lack of motor control, you may want to use a weapon with a larger surface area to ensure effective contact.

SPIRIT: COMMIT

A tutor was hired for two boys, a second-grader and a fourth-grader. The second-grader was failing reading, the fourth-grader was failing math. Each boy expressed to the tutor that they were slow, stupid, and bad at reading and math. After one session with each boy, separately, the tutor was perplexed as to why they were failing.

Once focused, the math student was able to complete the required homework problems correctly without instruction from the tutor. Before starting each problem, he would say that he couldn't do it. At each session the tutor would start making up more and more advanced problems and the student completed them with ease. Later the tutor found out that the boy's teacher had divided the class into a "slow" group and an "advanced" group. Being placed in the "slow" group and being told that he couldn't do math by experienced adults was all it took for him to fail. The tutor simply told him he could do math and he did and he was good at it.

It was a struggle to get the second-grader to read his homework assignments during the tutoring sessions. One night when the session was over, the tutor picked up a Round Table Pizza takeout menu that was sitting on the table. It had a short story in it about Knights of the Round Table. The tutor handed it to the boy and he read it aloud, very well, sounding out all the made up words in the story. Now that the torturous "homework" session was over, he was actually excited to read. The tutor started bringing in books about ghosts and pirates, instead of Dick and Jane and a dog, and suddenly the boy could read.

Once they were able to do something that they were told they were bad at, they lit up. They were energized and there was no stopping them.

We're often taught, unwittingly, to not believe in ourselves. Not believing in ourselves causes self defeat. There is an immeasurable power to believing; tap into it, however you need to and commit to your technique.

MOVE OFFLINE:

You will not be successful if you try to defend at the strongest points of your opponent's assault. You wouldn't block a straight punch by hitting it at the fist in the exact opposite direction of the punch. You wouldn't block a roundhouse punch at the wrist at the apex of the punch, the fastest part of the circle. Don't move straight in on people when you're sparring or when you're doing a technique. Avoid hurting yourself; don't collide dead on with your opponent's strikes. Even if they just stand there with their fist extended and you run into it, you're going to get hurt (equal and opposite forces).

A student with a black belt in another martial art gave me some advice one day after kickboxing class, with all good intentions. "You know, I was thinking about what you need to do when you're sparring. Since you're smaller, you're just gonna have to come straight in and take a few hits to get inside." Still scratching my head, but advice like that is what continually reminds me what different realities we all live in. As the small-fry, when you're able to take a few hits on your way inside and you're still able to get inside, it's because your opponent is controlling him/herself and trying not to hurt you. Don't get comfortable with that because if it was a real fight with full contact and your strategy was to take a few shots, you'll never see the inside. While we need to accept that we're going to get hit if we're engaged in a fight, don't make it part of your plan to take a few direct blows in an attempt to get inside or within reach of your opponent's targets. MOVE OFFLINE. Work angles.

USE TWO HANDS:

If things don't go quite right and your attacker doesn't release their grip or react the way you were expecting, don't forget you have a second hand. Maybe your motion got interrupted and you lost some acceleration or explosiveness. Engage your other hand in the technique.

In Darting Mace (figure 33), if the initial sequence of moves doesn't get them to release their grip, cup your left hand under your right fist and pull up and against their thumbs using your hip rotation before executing a right reverse punch. This will also set them in motion to collide with your punch.

Fig 33, Use 2 hands in Darting Mace

In Twin Kimono (figure 34) or other lapel grab techniques, if your right inward downward block or forearm strike doesn't clear their arms, then engage your pinning hand and pull them away with the strike.

Fig 34, Use 2 hands in Twin Kimono

MISCELLANEOUS:

- Don't be afraid to hit them again. Different opponents aren't all going to react the same to your actions. Instead of executing the technique in steps 1, 2, 3, and 4, you may have to double up and execute it as 1, 2, 2, 3, 4. In Mace of Aggression if they don't release their grip when you hit their arms with your forearm, hit them again. In Locking Horns you may have to hit them two or three times with your right shoulder to get space to finish the technique.
- Don't rely on pain compliance. Again don't be surprised at the different reactions you get or don't get with different attackers. Someone might be on drugs or they've built up a tolerance to pain and heavy contact. You'll have to move them or use leverage or break them.
- Sensory Overload: Throw combinations with more than three strikes to different targets. This can split your opponent's mind/body focus creating brain overload. It can distract them from applying their initial assault and get them to loosen up their grip for a moment.
- If you fight your opponent's point of attack where his concerted strength and focus are, then you're not likely to succeed.
- Maintain your posture and take the attacker's space aware from him/her. Get used to going through them, rather than feeling like you have to maneuver yourself around them. Don't lean or roll your shoulders forward; hit them with your shoulders and take their space.
- Don't drop yourself to the ground. It makes you vulnerable plus it will take more energy/work to get yourself up and make a quick escape. Get your attacker to the ground – that way he/she's the one who needs to overcome inertia and get up to chase you. You can apply your strikes and locks from a standing position.

- Create or use options when you haven't worked out how to apply the principles in the base moves yet or your body just hasn't picked up sophisticated motion or combined principles. Don't abandon the base moves because it didn't work the first time or because someone tells you it won't work for you. You may be surprised at what works for you and the answers may be in the base moves. The place to work it out is on the mat. Insert a groin strike in Sleeper (figure 35) so you don't have to stand up on your toes and try to reach for the choke. Use a figure four lock on your opponent in Spiraling Twig (figure 36) so they don't slip out from under your elbow and take them to the ground on your rotation. Grab their ear in Leap of Death (figure 37) and pull them where you want them to go.

Fig 35, Groin strike in Sleeper

Fig 36, Spiraling Twig

Fig 37, Leap of Death

- Small-fry hands will be smaller (figure 38), grip weaker, arms will be shorter, legs shorter. The opponent will always have the reach. Levers and fulcrums are not going to line up the same. Angles will be different. A taller opponent will be punching down at you. Instructors and students need to be aware of these things that are fixed and make adjustments. Small-fry students may get frustrated with the instructor that expects them to lengthen their forearms to make the technique work.

Fig 38, Hand size – use your forearm to assist the wrist lock

Chapter 4

CONCLUSIONS

We can't expect others to reason, learn, and process information the same way that we do, nor can we devalue or be dismissive with those who think differently. It's very easy to unwittingly discourage children and destroy their self-esteem because we don't understand what they need to learn and develop new skills. Children who learn new kenpo material slowly or can't pick up a certain move right away, like some of their peers, will think that they are dumb or have less value or nothing to offer. This self-deprecation can be amplified by impatient, short-sited instructors who leave them behind or instructors who favor the "natural" who has a "talent" for the art. When this occurs, we may be leaving behind someone who could have taken kenpo to another level, or someone who has a good chance of being assaulted. Don't discount the small-fry, the girl, the klutz, or the "slow" learner. Among the many things that the underdogs can bring to the art, if allowed, is sharing the physiological effects of real combat experience due to the disturbingly high likelihood that they have been assaulted.

The small-fry's natural instincts will probably cause them to have a tendency to separate themselves from the technique like in the first two photos of figure 7. This distance is much more comfortable and feels less threatening. Our heart rate, anxiety, and panic increases significantly the closer we are to our bigger, stronger attacker. It's a horrible, helpless feeling to be restrained even in a controlled training environment. This can also be an added obstacle in getting the small-fry to believe that they can defend themselves, especially if they've experienced an assault. Not everyone understands the significance of this and I'm not sure how to bring it home for those who don't. I've had instructors tell me that I shouldn't worry about ever having to use kenpo because women aren't really assaulted as much as "they" say and all I have to do is not engage in fights, just walk away. While this paper is not about men and women and statistics on violent crimes, hopefully this will provoke some thought: Gavin De Becker writes in The Gift of Fear: "Men are afraid that women will laugh at them. Women are afraid that men will kill them."

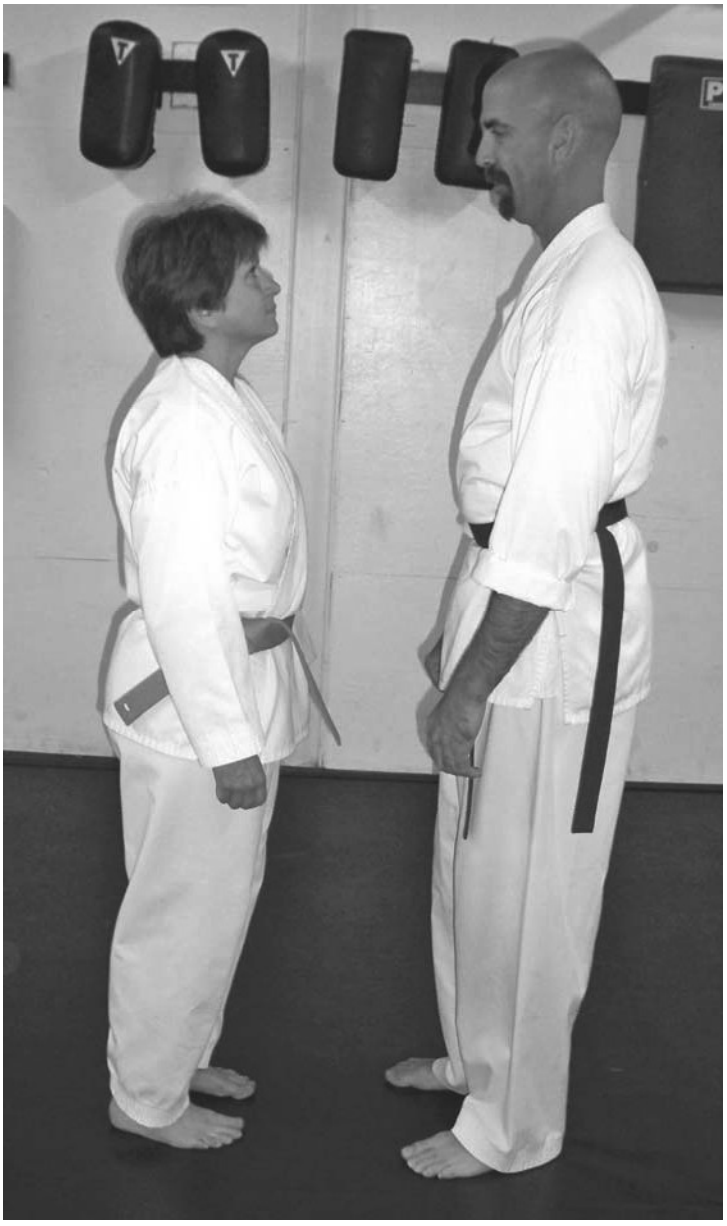
Trust your own instincts. If you feel vulnerable in a particular position or move in a technique, you probably are. Make a note of that step and identify what's making you feel that way. It could simply be your lack of experience in that particular position, with that particular move, or with the size and reaction of your opponent and the different angles that are created. Once you have gained experience with that sequence of the technique and you still feel frustrated or vulnerable, you may be able to correct it by a simple adjustment of posture, direction, fusion, acceleration, use of opposing forces, explosiveness, or you may have to alter the move all together.

Make yourself the small-fry now and find a way to make it work. As we age our joints wear and become weak. We work 10 times harder to be a quarter as strong and fast as we were (if we're lucky). Be a problem solver. Be analytical. Pick a specific problem to solve, or if you have the time, analyze every move with the goal being to be effective without any effort.

On the mat, the big-fry kenpoist often enjoys taunting and mocking the small-fry kenpoist in technique line. As the small-fry, it's your ultimate goal to turn it around and make the big-brother-teasing-you syndrome more like shooting Bengal Tigers with a sling-shot.

NASA brought in an optical engineering consultant to help resolve the problems with the Hubble Space Telescope. The consultant was introduced to the NASA executive as an expert in optical engineering. The executive looked at the consultant skeptically and said "So what qualifies you as an 'expert'?" The consultant thought for a moment and replied "I've made every mistake there is to make". Right now my instructor is thinking "then you must be a friggin' genius by now." We're so afraid of failure and making mistakes that we miss out on a lot. So many people rejoice in our failures and can't wait for us to make our next mistake that we limit ourselves and don't try. Start loving your mistakes; they will make you a better martial artist, student, and instructor.

In the world we live in, when it's not about a tournament or demo, when there are no rules, when it's about survival and you're the underdog, you have to ask yourself a question…Do I believe?



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APPENDIX A– EQUATIONS

Force = mass X acceleration = ma
Weight = mass X acceleration due to gravity = mg
Speed = distance/time = d/t
Velocity = speed/time = v/t
Acceleration = force/mass = F/m = velocity/time = V/t
Angular Acceleration = velocity squared/radius of circular path = V^2/r
Momentum = mass X velocity = mV
Torque = distance (lever arm) X force = dF
Impulse = force X time = Ft = change in momentum = mV_1-mV_2
Work = force X distance = Fd
Power = work/time = (force X distance)/time = Fd/t
Kinetic energy = 1/2mass X velocity squared = $1/2mV^2$
Pressure = force/area = F/A

APPENDIX B – LEFT BRAIN/RIGHT BRAIN CHARACTERISTICS

Left Brain (visual)	Right Brain (auditory)
Analytical approach	Systemic approach
Separates elements	Links elements
Handles one variable at a time, narrow focus	Handles many variables at once, unfocused
Interested in and knowledge of the how	Interested in and knowledge of the why, need to make sense of things
Accumulation of knowledge	Creative thought
Proof based on trial and error	Proof based on direct comparison of model with reality
Abstract/theoretical thought based on concepts, words, numbers	Concrete/realistic/practical thought based on experiences
Verbal memory based on concepts, encyclopedic knowledge	Memory of specific experiences, feelings
Extrovert – optimism, sociability	Introvert – wisdom, reserve
Reasoning from acquired knowledge	Reflection supported by actual experience
Puts together pieces to build a general picture	Immediate recognition of a whole from one of its elements
Gradual awareness of elements of complex spatial structures	Direct grasp of complex spatial structures
Underinclusive, fragmented, linear thought	Overinclusive, complex, circular thought
Intensive, selective, narrow, specific attention	Extensive, inclusive, wide, diffuse attention
Strong attention control	Weak attention control
Slow to become self-conscious, quick to dissipate	Quick to become self-conscious, slow to dissipate
Remembers verbal imagery	Remembers non-verbal imagery
Unable to remember irregular shapes	Remembers strange shapes
Remembers theories from school	Forgets most theories from school
Good verbal orientation	Disoriented verbally
Poor spatial orientation – doesn't check environmental details	Good spatial orientation – checks out everything, notices details and orients him/herself accordingly
Master of words	Master of sound
Can easily picture what they're reading	Have trouble picturing what they're reading
Remembers words, but may not grasp the meaning	Grasps the meaning, but may not remember the words

Left Brain (visual)	Right Brain (auditory)
Can’t see the forest thru the trees	Sees the big picture
	Needs to put things into context, reflective
Starts with the pieces and builds a big picture only with what they know	Starts with the complex and breaks it down
Reacts in the moment	Evaluates before reacting, slower reaction time
Doesn’t feel pain until later	Feels pain immediately, so is interested in protection