Name: Doug Kim

Date Submitted: November 17, 2005

School: University of California, Berkeley

Club: Yongmudo

Rank: 3rd Dan

Type: Paper

Title: Aging and Martial Arts Training

Author: Doug Kim

Citation: None

Abstract: Aging is a natural process. However, the ill effects of aging can be mitigated to a significant degree by regular, vigorous exercise. Training (exercise) is a major part of the "Way" (***Do***) in many martial arts. Thus continuing training as we age is an important component of pursuing the Way that we as martial artists espouse. In this paper we have examine the aging process in some detail and consider strategies to continue training as we age.

Total # of pages: 14

Electronic version also submitted: Yes

E-type: Mac

Copies:

1. 3 hard copies (in folder)
2. 1 e-copy (formatted as MS word file) on disk.
3. 1 e-copy (formatted as text file / unformatted) on disk

Application used, with version MS Word X of Mac

CONTEMPORARY "MARTIAL ARTS" AS "*DO*"

Many contemporary "martial arts" incorporate the word "***Do***" into their names. (e.g., ***Tae Kwon Do, Judo, Karate Do, Aikido, Kendo, Iaido***, etc.) The Chinese character that "***Do***" refers to is a pictograph meaning road, path, or "Way". Styles that end their names with "***Do***" imply or contend that their style is in some sense a "Way" of life - as distinct from mere "technique" or "skill" – which in Japanese is referred to as "***jitsu***" and in Korean as "***sul***". Here are some examples:

- ***Tae Kwon Do***: The way of the Foot and Hand
- ***Judo***: The Gentle Way
- ***Kendo***: The Way of the Sword

- ***Aikido***: The Way of Universal Harmony

The practice of ending the martial arts "style" with the word "***Do***" has roots in two separate events. First, when Dr. Jigoro Kano (1860 – 1938) was creating the sport *Ju**do***, he purposely and systematically "de-militarized" traditional ***Ju-Jitsu***, eliminating or modifying lethal and maiming techniques in favor of ones that could be used safely in a sport context. His goal in creating *Ju**do***, was to encourage the physical, mental and spiritual development of the individual, and thereby improve society (one ***Judoka*** at a time). Kano purposely chose the name *Ju**do*** for his fledgling sport to give it an ethical connotation – in sharp contrast with *Ju-**Jitsu***, which refers only to skills and techniques.

Second, after World War II the U.S. administered occupation of Japan (1945 – 1952, under the leadership of General Douglas MacArthur) initially outlawed the teaching of Japanese martial arts. However, over time various schools were opened (or re-opened) having named (or re-named) the styles they taught as "***Do***" instead of the more traditional "***Jitsu***".

The notion that a "Way of Life" or "Way of Conduct" was being taught instead of pure fighting or warrior skills / techniques allowed many traditional Japanese martial arts to be revived under the watchful eye of the Occupation forces. So, it is now commonplace for many martial arts to be named "_____ - ***Do***".

Despite the now ubiquitous "***Do*"** at the end of most martial art's names it's worth reflecting on the meaning and implications of this simple word. "***Do*"**, in contrast to "***Jitsu***" (i.e, the "Way" vs. "technique" or "skill"). It is not unlike the difference between "Wisdom" and "Knowledge". Fighting "skill" without a moral context within which to use it may denigrate into simple thugery. Likewise, knowledge of facts and figures without the wisdom of how to use and apply them is useless. So, the "Way" (Do) in which we use or fighting skills – and indeed the "Way" in which we lead our lives - becomes a paramount part of the contemporary study and practice of martial arts. In fact, in an age of gun and high-tech weapons, the study of bare-handed fighting only for the sake of self-defense is somewhat limited. However, the use of such study as a means of training oneself (physically, mentally and spiritually) is very practical and useful far beyond the walls of the training hall (***Dojo*** or ***Dojang***).

In learning the meaning of "***Do***" in martial arts, practitioners pursue intangible goals including:

- courtesy
- integrity
- perseverance
- indomitable spirit
- self-control

Moreover, an ideal common to many modern martial arts is to promote the unity of mind, body and spirit. (The "mind" being defined as one's mental focus here and now, and "spirit" being defined as one's "soul" - eternal and unchanging.) In short, a major objective of martial artists who practice and study various "***Do***" is to develop, refine and strengthen their physical bodies, mental facilities and the harmonious coordination of these two aspects of existence with the more ethereal concept of "spirit" (or "soul").

"***Do***", as the "road" or "path" holds two oft-cited admonitions for the marital artist. One, "keep moving"! Never stop learning, growing or pursuing the "Way". Or, as it has been said: "If you don't keep moving ahead, somebody gonna come from behind and run you over!"[1]. Second, "the journey is more important than the destination". In other words, the sweat, work and practice needed to achieve the next level is more important than arriving at the next level itself.

While the meaning of "***Do***" is of import to all who study martial arts, has particular relevance to older practitioners. While I'm sure that "we know who we are", for the purposes of this paper we'll consider "older" to mean 40 and over. For us keeping mind, body and spirit in harmony increasingly takes self-control and an indomitable spirit. And if pursuing this unity is truly one of the reasons we train, is it not more important and increasingly relevant as we get older and face the challenges of aging?

KNOW THY ENEMY – PHYSIOLOGICAL AGING

> If you know the enemy and know yourself, you need not fear the result of a hundred battles.
>
> If you know yourself but not the enemy, for every victory gained you will also suffer defeat.
>
> If you know neither the enemy nor yourself, you will succumb in every battle. ***Sun Tzu***

The numerous theories about the causes of aging are beyond the scope of this paper. Likewise, highly detailed scientific descriptions of the aging process are not covered here. For our purposes we'll focus on the general changes that take place in the body that are most common and relevant to training and aging.

1) CARDIAC OUTPUT

Figuratively and literally speaking the heart of the aging process is gradually decreasing cardiac output. The loss of peak cardiac capacity (as measured by maximum heart rate) not only accompanies aging, but cardiovascular disease is "far and away the most common cause of death and disability in the United States and throughout the developed world".[2]

From a training perspective, peak heart rate typically drops from 200 beats per minute for a 20 year-old to 160 beats per minute for a 60 year-old. Indeed, the rule of thumb for calculating maximum heart rate is to take your age and subtract it from 220. So by age 70 we're down to 150 beats per minute, and

by age 80 down to 140 and so on. Furthermore, there is evidence that suggests with age the heart becomes less responsive to the surge of adrenaline that occurs with exertion. [3]

Perhaps even more unsettling is the relentless accumulation of cholesterol plaque in the arteries. A full discussion of HDL (high-density lipoprotein), the so-called "good" form of cholesterol, versus LDL (low-density lipoprotein), the "bad" cholesterol, and triglycerides, another kind of fat that can damage arteries, is equally confusing an depressing. For most of us it means that we should cut back or give up many of our favorite foods, and/or consider taking LDL lowering drugs. But for all of us living and eating in our modern world it means that over time we're accumulating cholesterol plaque on the inner walls of our arteries – at a rate, and to a degree that our primitive ancestors could have never dreamed of. Ironically, doctors often refer to this a kind of build-up on arterial walls as "pizza topping', because of it's color and waxy consistency. The danger of course with cholesterol plaque build-up is that it can severely decrease the flow of blow through an artery (e.g., coronary atherosclerosis – in which the arteries supplying the heart muscle with blood become narrowed or partially blocked), or halt blood flow completely, which can result in a "stroke" or "heart attack".

Overall, the prospect of a gradual, but inevitable decrease in our maximum heartbeat capabilities and seemingly equally inevitable build-up of plaque in our arteries is not a happy one

2) AEROBIC CAPACITY

Aerobic capacity is defined as they body's ability to process oxygen, moving from the lungs into the blood, through the bloodstream and throughout the body. So aerobic capacity is not just a matter of having good lungs, but a healthy heart and a sound vascular system (system of blood vessels). Unfortunately as we age the maximal oxygen intake declines – by about 5 ml.kg-1.min per decade from age 25 – 65. [4] For the average male this means, at age 30 your aerobic capacity has already started to decrease and by age 65 it may be down as much as 30% to 40% of what it was at age 20. A fancier measure of aerobic capacity is something called "**VO_2 max**". Also known as "oxygen pulse", VO_2 max is the maximum volume of oxygen consumed by the body per heartbeat (during intense, whole-body exercise). As such it is an excellent measure of physiological vs. chronological aging. Any way you measure it though, the sad truth is that with age our ability to get oxygen into the body and utilize it diminishes with age.

3) SARCOPENIA

"Sarcopenia" is from the Greek for "loss of flesh" and refers to the loss of muscle mass that occurs with aging. The depressing truth is that with age we not only lose muscle mass, but also muscle strength – and it turns out that most muscle loss is that of "Type II" (aka "fast-twitch") muscle fibers.

Muscles have two distinct types of cells; strength cells and endurance cells.

Endurance cells

(aka "slow-twitch" or Type I muscles) have more mitochondria for greater endurance, but less power.[5] Fast-twitch muscle cells are for strength, have less mitochondria, but much more power. Individual nerve cells transmit signals to either strength (Type II) muscle cells ***or*** endurance (Type I) muscle cells, but not both. Therefore, each single nerve cell can call up for either strength or endurance.

Muscle strength peaks about age 25, levels off around 35 – 40 and then declines. Peak force drops about 25% by age 65 [6]. And even though the loss of Type II muscles can be forestalled by exercise, the decline is inevitable. This is why world-class sprinters (who require bursts of great speed and power) peak in their late teens to early 20s, while world-class marathon (endurance) runners compete into their late 30s.

4) BONE DETERIORATION

There are two types of bone in your body: cortical bone – solid looking and compact, this type of bone is mainly found in shins and forearms; trabecular bone – made up a latticework of bone spicules (small, needlelike structures made up of calcium carbonate) found in the spine, thighs and hips. Over time calcium loss causes loss of both types of bone, but more trabecular than cortical. This loss, which can start as early as 30, can contribute the deterioration of the bone matrix leading to a loss of height and makes the bones more brittle. In women the process of calcium loss accelerates for about 5 years around menopause. A classic injury among older people is the fracture or breaking of a brittle hip (often triggered by a loss of balance) that results in irreversible bed rest and death.

5) FLEXIBILTIY & RANGE OF MOTION

The elasticity of connective tissue (i.e., those structures that connect muscles to bones) including tendons, ligaments and joint-capsules decreases with age. Decreased elasticity, often combined with arthritis, results in decreased flexibility – especially in hips, knees and other joints. This means that these joints must bear increased stress while we exercise, instead of dissipating the stress around to nearby tissues (other muscles) as happened when we were younger. Over time the stress on aging joints can injure and eventually destroy them. Meanwhile, the range of motion that the joint has will also decrease.

6) BASAL METABOLIC RATE & TYPE II DIABETES

"Metabolism" is a fancy way of referring to the ongoing chemical process of creating and

destroying tissue, releasing heat and energy in the body. "Basal Metabolic Rate" (BMR) refers to the measurement of this process while you are at rest (e.g., when you first get up in the morning). BMR therefore is a benchmark that establishes how many calories your body is using at rest, when activity is low but "fuel" is

still needed to keep you alive. Putting it another way, BMR is a measure of your "base" efficiency at "burning" calories.

In general "a person's BMR declines about 2 percent per decade starting at age 20".[7] Unfortunately, while BMR falls as we age, appetite usually does now. So by the time we're 30 we may ***need*** 100 less calories a day – but if we're still eating like we're 20 (and not exercising), the combination of lower BMR and what are now "excess" calories will result in body fat. (Sadly, one of the laws of nature is that unused calories will be stored in the body as FAT.) At age 25 a man's body on average is composed of 18 percent fat, but by age 65 this increases to 38%[8]

Glucose refers to sugar in the blood, which results from food intake. The body seeks a constant blood-glucose level – regardless how much we eat. If we eat too little, the liver makes extra glucose to compensate. Conversely, if you eat too much, the pancreas releases insulin – which causes muscle cells to use more glucose. With age, decreased muscle and increased fat, it becomes harder and harder for the body to maintain this balance. More and more insulin is required to induce decreasing muscle tissues to use more glucose. To make matters worse, with age the pancreas has increasing difficulty putting out extra insulin. "Diabetes is an absence of insulin, or an abnormality in which the action of insulin is blocked and sugar cannot get into cells properly."[9]

There are two types of diabetes; Type I, known as "juvenile-onset or insulin-dependent diabetes, and Type II, called adult-onset or non-insulin-dependent diabetes. The type that concerns us is of course Type II. The major danger from Type II diabetes is permanent vascular problems. High levels of blood sugar (glucose) work together with high cholesterol, high blood pressure (and/or smoking) causing atherosclerosis in the arteries to the heart, brain and legs. Not only does Type II diabetes contribute to a higher incidence of strokes and heart attacks, but it can also cause blindness and destroy the kidneys.

The key caveat of this section is that with age comes: decreasing BMR; increased body fat; and high levels of blood-sugar. All of which can contribute to Type II diabetes.

7) SENSES, COORDINATION & BALANCE

The final "insult" we'll discuss is the general deterioration of the nervous system. As we age our sense of vision and hearing become weaker. Less blood flow gets to our brains resulting in decreased reaction time – and thus slower reflexes. And perhaps most alarming of all, our ability to keep our balance and coordination ebbs away. This is of particular concern because (as noted earlier) a fall by a senior often results in a broken or fractured hip, that may also result in a stroke-inducing clot heading toward the brain – or a period of bed rest from which one will not escape.

FINALLY, THE GOOD NEWS

While the "laundry list" of ailments associated with aging are almost enough to

keep anyone from trying to grow old, there is some good news... and some bad news. First some background...

Plasma in the bloodstream carries numerous proteins and chemicals that govern almost every aspect of our physiology: immunity to disease, accumulation of fat, metabolism, growth and development, emotional state, breakdown and decay of tissues, etc. All of these processes boil down to a balance between inflammation and repair. The process goes like this... When a cell is stressed (e.g., from exercise) it begins to release specific substances that will begin inflammation – which is the basis for repair. These specific chemical substances enter the bloodstream and gather white blood cells to the stressed zone. Then, once the inflammation has done the "demolition" work, white blood cells retire and there is a "clean slate" for new growth and re-building. The chemicals that govern inflammation are known as cytokines.

There are hundreds, maybe even thousands of these chemical "messenger molecules" in our bodies called "cytokines". These molecules control virtually all the metabolic pathways in our bodies, and they interact to "coordinate growth or decay throughout your body, regulating growth and decay down to the most microscopic level".[10] Among all the cytokines there are two specific ones; cytokine-6 and cytokine-10 named after interleukins 6 and 10 that control decay and growth in the muscles. Oversimplifying things for the purposes of this paper, cytokine-6 (C-6) is the "master" chemical for inflammation (breakdown or decay), and cytokine-10 (C-10) is the master chemical for growth and repair. "C-6 is produced both in the muscle cells and the bloodstream in response to exercise, and C-10 is produced in response to C-6. This is you body's brilliant mechanism for coupling decay and growth. C-6 actually ***triggers*** the production of C-10. Decay triggers growth."[11]

Now for the bad news. In order for C-6 to trigger the release of C-10 requires ***vigorous*** exercise. A leisurely walk through the park won't do it. You gotta sweat. And, to add to the problem the default setting of our bodies calls for a constant drip, drip, drip of C-6. In other words, without exercise our bodies are naturally and constantly in the process of decay. The final insult is that the older we get the more we secrete C-6. In short, the process of decay in the body is relentless and inevitable.

The only saving grace in this scenario is that ***vigorous*** exercise can cause a rush of C-6, which in turn promotes the release of C-10 (our hero!). C-10, as you may recall, causes the re-building and repair of the body. It can offset the decay/demolition caused by C-6, leaving you better off than you were before the initial C-6 release. But remember, the release of C-10 is only triggered by inflammation (exercise) sufficient enough to trigger the release of significant quantities of C-6.

All of this is a gross simplification of the complex processes going on inside us. But the basic message and meaning is simple: Vigorous exercise can result in the overall rebuilding, regeneration and growth of the body. Another useful way

of looking at this process is from an evolutionary perspective.

In nature as winter approached animals prepared for the approaching cold and maybe even hibernation by storing body fat, conserving energy to survive, and ***not*** expending it by investing in growth and new tissues (e.g., muscle). In fact, animals prepare for hibernation by consuming extra calories, slowing down their activity and accumulating fat. So, by leading a sedentary life-style, or even worse – being a "couch potato" you are essentially telling your body that it's soon going to be winter and we'd better fatten up! Moreover, the primitive part of our brain interprets a lack of physical activity and the accumulation of fat as the signals that it's time to prepare for famine (or hibernation).

Fortunately, by exercising we are telling our bodies that it's ***springtime***. Time to revive, invest calories in new muscle growth, and in replenishing the body with new tissues – bone, connective tissue, muscles, joints, etc.. Storing fat is no longer the goal – preparing for renewed activity is. We need to get ready for the hunt – hunting and gathering in the sunlight and being a major–league predator. In short, by regular exercising we are telling our bodies that it's ***always*** springtime. It's always time for renewal, putting on lean muscle and shedding fat.

BENEFITS OF EXERCISE

The reason we spent so much time trudging through the minefield of problems related to aging is so we can more fully appreciate the wonderful, indeed life-giving, benefits of regular vigorous exercise. Let's take a brief look at how exercise can improve or even ***prevent*** age-related ailments.

1) CARDIAC OUTPUT

> Like any other muscle in the body, the heart responds to regular exercise by getting stronger. ***Gradually*** increasing stress on the heart muscle itself will strengthen it – and of course, to stress the heart muscle, other muscles (e.g., in the legs or arms) must be used first. Although an older heart will not increase in size in response to exercise, as much as a younger heart will, there can still be improvement in the strength and output of the heart from regular, vigorous exercise.
>
> Additionally, exercise lowers hypertension – so it is often prescribed to persons suffering from high blood pressure.

2) AEROBIC CAPACITY

> Exercise improves aerobic capacity in two ways: It causes the density of the capillaries to increase, thereby increasing the quantity of oxygen-carrying blood to the muscles. This in turn causes the muscle cells themselves to become more efficient in using the oxygen – and better able to obtain energy from food eaten, and energy stored as fat.

3) SARCOPENIA

Although replacing the "fast-twitch" Type II muscle fiber as we age may not be possible, it is very possible to maintain, an even increase both muscle mass and strength. Even seniors in their 60's and 70's make significant gains in strength with gradually increasing weight training over the course of several weeks. The key to increasing strength is gradual progression, and adequate rest after exercise to allow for healing and rebuilding of muscle tissue.

4) BONE DETERIORATION

Interestingly, the key to maintaining bone density and strength is stress. (In addition to getting enough calcium and other minerals in your diet). Like muscles, stress (e.g., from bicycling, running or even plain ole walking) causes bones to get stronger. Evidently stress causes the bones to take more calcium from the blood, becoming stronger. Weight-lifting seems to enhance this process too as the increase in muscle mass demands that the bones supporting the muscles become stronger,

5) FLEXIBILTIY & RANGE OF MOTION

Not everyone will realize improved flexibility or increased range of motion from exercise. There are those among us who will remain stiff in certain areas – or just get worse over time. However, exercise will most likely help ***preserve*** or ***maintain*** them, Stretching (always a good idea before and after a work-out) not only helps prevent pulled muscles, but generally also improves these areas. In any event, exercise promotes stronger connective tissues and joints – to support new and stronger muscles,

6) BASAL METABOLIC RATE (BMR) & TYPE II DIABETES

Unlike flexibility and range of motion, BMR can be almost universally improved with exercise. Regular exercises builds muscle and forces the body to burn more calories to create more energy – and over time can convert body fat into energy as well. Moreover, by using more blood-sugar (glucose) and turning it into energy to support exercise reduces (and may well eliminate) the risk of Type II diabetes. For those of us who really like to eat this is goods news – but not great news. We can probably eat more than we should – but it means that we will also have to exercise more than we want.

7) SENSES, COORDINATION & BALANCE

Although the strength of the heart muscle with exercise will improve blood flow to the brain, - the gradual deterioration of the senses, nervous system and reaction time may not be offset. However, exercises that require balance and coordination (e.g., cycling, jumping

rope, etc.) will help retain these abilities. In so doing these exercises may prevent a fall, a broken hip, and a one-way trip to bed-rest.

RISKS OF MARTIAL ARTS TRAINING

For the past several pages we've made no distinction between "exercise" and "martial arts training".

This was intentional because the benefits of exercise and training are the same in the ways in which they "combat" aging. As mentioned before however, martial arts training – as a "way of life" puts the exercise part of training into a context. And, unlike many other forms of exercise, martial arts training and practice (sparring, throwing, falling/rolling, wrestling, etc.) has unique inherent risks. Therefore, like any other form of exercise, consulting with your personal physician ***before*** starting a new exercise program is wise for the older athlete – and for an older person starting martial arts training, additional consultation with the senior instructor (as well as practitioners of a like age in the class) is a wise idea.

Certain styles are better suited for certain body-types: Kicking and striking arts like ***Karate*** and ***Tae Kwon Do*** may be better suited to taller people who will enjoy the longer reach of their arms and legs. But these arts also put a great deal of strain on the knees, ankles and feet; ***Judo*** may be better suited to shorter, stockier people – but all the falling, rolling and mat-work can put a huge strain on the neck and back. ***Aikido*** and ***Ju-Jitsu*** are full of various forms of human ***origami***, twisting and turning joints in ways God never intended – and even the most supple person can wind up with a "tweaked" elbow or wrist in these arts. The point of this discussion is that finding the right art – or atleast being aware of the inherent risks of your chosen style is important to the martial arts practitioner (especially one who is starting up a little later in life).

TRAINING STRATEGIES FOR THE "MATURE" STUDENT / PRACTITIONER

Unfortunately there is no "magic pill" that can make training easier or less painful. However, here are a few tips that may be useful. Please bear in mind that these should be "seasoned to taste" depending on your particular body type, flexibility, past injuries, choice of martial art, etc. There is nothing "hard and fast" about the following "strategies" and you should use what works for you, discard what does not and try to find what compliments and improves your training regimen.

1) WARM-UP BEFORE CLASS FOR THE WARM-UP IN CLASS

I find that the "in-class" warm-up – with the rest of the class (most of whom are in their 20's) is not quite long enough for me to actually get "warmed-up" (even though this initial part of class can last up to 30 minutes). In fact, sometimes I'm so stiff and my muscles are so cold that even doing the warm-up exercises is difficult. So tip #1 is to arrive about 30 minutes before class and "warm-up" for the "warm-up".

Starting with slow, rotations of the arms, hands, legs and feet to get the joints

going, and then moving into calisthenics is a good way to begin. You want to get the synovial fluid, which lubricates and cushions the joints, well distributed within the joint capsules. Likewise you want to begin getting your heart rate up and blood flowing into all parts of the body. In this regards it's often suggested that starting with the legs is best – because they have the largest muscles in the body, require the most blood and get the heart pumping the fastest.

Everyone has a little different routine (often dependent of the subjects to be covered that day in class), and so there is no "best" warm-up. However, by the end of the warm up your joints should be moving comfortably, muscles are well supplied with blood, and you've stretched a little (before, during or after warm-up) and personally, I like to have a nice film of sweat beading on my forehead to let me know that I'm ready for action.

Warming up is one of best ways to protect against pulled or strain muscles and joint injuries. In fact, it's so important that if you're late to class I encourage you to find a corner and do your own private warm-up routine for 15 – 20 minutes ***before*** joining the rest of the class.

2) "CHEAT" WHEN YOU STRETCH

Most "standard" stretches are meant for young people on the low side of twenty or for older people who are part contortionist. Trying to do standard stretches for a "mature" person varies from simply undignified to just plain impossible. Therefore, I recommend and personally practice the "cheating" whenever possible when it comes to stretching.

By "cheating" I don't mean hiding in a corner behind everyone else so that can't see you– and grunting to simulate the joyous sounds of a good stretch (although sometimes this idea has merit). I ***do*** mean ***modifying*** the standard stretch so that you can do ***part*** of it and get some benefit from the stretch – rather than sitting it out while muttering about how impossible it is. For example, instead of a "full split" with hips, knees and ankles on the ground – shooting out from both sides of the torso, a modified version might be to extend the legs as wide as they will go apart from each other from a kneeling position. This "half-stretch" still benefits the muscles in the thighs and is not as intimidating (or embarrassing) as a full-split. Experimenting with other stretches can yield many "half-stretches" that are valuable to the mature practitioner, especially in cases that the standard stretch is not an option, or of minimal benefit.

Remember, hold the stretch for a good 30 – 60 seconds for the most benefit, and don't "bounce"!

3) MODIFY EXERCISES REGUARLY

Many martial art exercises are fast-paced, hard-hitting and wreak havoc on "mature" joints and muscles. High kicks to a heavy bag done at a machine-gun pace for example is not a good steady diet for an older martial artist. And while, this drill is certainly something to be included now and again, it will likely do more harm than good if over done. An alternative that will result in less

impact to the knee, ankle and feet (but will still strengthen the leg muscles) would be to simply kick lower on the bag. Perhaps only at first, say 25% – 50% of the ultimately desired height. Then after several sets of say 5 – 10 kicks at this height, more sets at 50% to 75% of the target height, and so on. The point is that with age often comes the need to "work-up" to drills that younger practitioners (or a younger you were able to) do with ease. The same concept applies to the speed of the drill. Start out slow, gradually picking up the pace. Give your body time to warm-up and "catch-up" with those 19-year-old kids!

Along the same lines, you may find it useful to change some drills or exercises to have fewer reps, but with greater frequency. This will allow you more time to rest and recover between sets, but increase your endurance because of the greater number of sets.

An exercise modification I made was to switch from running to stationary bicycling. In so doing I was able to retain the benefits of aerobic exercise, but without the pounding and stress on my knees and shins.

Similar aerobic benefits could have been derived from swimming instead of running – but with more build-up in arm strength and in the legs.

The point of this section is to encourage you to find ways to make drills and exercises better suited to your needs. This may mean making them less taxing on your knees or elbows – or slowing them down so you can actually ***breathe*** while doing them. Don't be afraid or embarrassed! Experiment! Make the exercise work for you – not the other way around.

3) ONLY WEEDS AND CANCER GROW "OVERNIGHT"

In nature the only two things that make startling progress seemingly "overnight" are WEEDS and CANCER. Everything else, especially things of value, take time to build up, progress and succeed. As a culture we're always in a hurry, and we want things in an instant: fast-food, ATMs, and micro-wave ovens.

But martial arts training should and does take time. Progress is gradual, gained drop-by-drop, it is progressive – ***not*** immediate.

Initially there is a period of a few months just to get your body accustomed to the demands of training in your chosen martial art. Only when the body is conditioned and "knows what to expect", can higher learning start. Then, repetition and more repletion is the key to success. Within this reality – especially for us "old dogs", it's often useful (and sometimes necessary) to break down a technique into the smallest component or part that is possible – and work on that component only and then the next one. Finally, once the components are "polished" and ready to go they can be assembled into the final product. In other words, a useful strategy for older practitioners to learn new skills is break them down into "bite-size" chunks, "chew" those thoroughly, and only after digesting and mastering the constituent parts – put them together into the final complete technique.

4) SELF-CARE

One of the more common character traits among martial artists is a vast capacity for denial. Often we've been practicing our art for so long, and enjoy it so much that we don't want to admit that something has happened that may prevent us from participating – or that we've been injured enough to need medical attention.

In some cases it's a matter or stoicism or just plain stubbornness, in other cases the school "philosophy" advocates a "tough it out" policy towards injuries. The problem is that as we get older the margin for error gets lower, and the living with an injury or neglected injury gets harder. So once you get north of 40 listen to your body more – it's old! And, ignoring those twinges and little pains may just lead to bigger pains and an inability to do certain favorite things. We all like to believe that sooner or later we'll be "back to normal". Unfortunately, after 40 "normal" often means permanently injured in a given area – or permanently unable to do what we could with ease at age twenty.

And don't be in a rush to get back to training after an injury. Give yourself adequate time to heal. Listen to the doctor, and give yourself enough time for your body to repair itself. Otherwise you could be out twice as long – or permanently.

On a lighter note, while training neoprene "sleeves" (for elbows, knees, wrists, etc.) not only offer support to the joint, but help keep it warm. It's important to keep well hydrated while training and after. Sports drinks (e.g., Power Aide, Gatorade, etc.) are great ways to replace electrolytes sweated out while training. Warm baths, analgesics, and anti-inflammatory pills (e.g., ibuprofen) after a hard-work out are also great ways of recovering.

5) TRAINING WITH YOUNGER PRACTITIONERS

Training with martial arts practitioners who are younger can be challenging – especially if they can do things that you could do once upon a time, but can't anymore. Hopefully they look upon you more as a friend, ally, mentor and resource – rather than a competitor. But the fact of the matter is – or eventually will be, that their abilities may surpass yours. Here are a few things to bear in mind.

- While it's important to accept our weakness, it's more important to play to our strengths. Speed and agility may overcome sheer strength, greater control of balance and timing win over superior force. So develop skills and strategies that capitalize on what you do well.
- One of the goals ***Jigoro Kano*** (the founder of ***Judo***) established for his new sport was to "achieve maximum results from minimum effort". This is a good rule for older martial artists to follow when sparring with younger ones. Conserve your energy, seek an economy of motion and energy and try to get the biggest effect for the least input.

- In the same way, rely on technique rather than strength. If you have a good understanding of the physics of many martial arts techniques (especially in ***Judo*** and ***Ju-jitsu***) you can actually use your younger opponent's strength and momentum against them.
- Protect you back! Lift from the legs –not with the arms or back. "Strongman" lifts are the province of the young. One slip can put you out of commission for weeks – or worse!

CONCLUSION

Aging is a natural process. However, the ill effects of aging can be mitigated to a significant degree by regular, vigorous exercise. Training (exercise) is a major part of the "Way" (***Do***) in many martial arts. Thus continuing training as we age is an important component of pursuing the Way that we as martial artists espouse. In this paper we have examined the aging process in some detail and considered strategies to continue training as we age.

Footnotes:

1. Quote attributed to Dr. Ken Min, founder of the UC Berkeley Martial Arts Program.

2. Page 2, The Third Third, Tom Connally, MD Bright Sky Press, ISBN 0-9704729-2-7

3. Page 304, Men's Fitness Magazine Complete Guide to Health and Well-Being, Kevin Cobb, The Philip Lief Group, ISBN 0-06-273354-0

4. Physical Activity and Aging, 2nd Ed. Roy J. Sheppard London: Croom Helm Publishing, 1987

5. Page 170, Younger Next Year, Christopher Crowley and Henry S. Lodge

   Workman Publishing Company, Inc. New York, NY , ISBN: 0-7611-3423-9

6. Physical Activity and Aging, 2nd Ed. Roy J. Sheppard London: Croom Helm Publishing, 1987

7. Page 303, Men's Fitness Magazine Complete Guide to Health and Well-Being, Kevin Cobb, The Philip Lief Group, ISBN 0-06-273354-0

8. Page 303, Men's Fitness Magazine Complete Guide to Health and Well-Being, Kevin Cobb, The Philip Lief Group, ISBN 0-06-273354-0

9. Page 39, The Third Third, Tom Connally, MD Bright Sky Press, ISBN 0-9704729-2-

10. Page 68, , Younger Next Year, Christopher Crowley and Henry S. Lodge

Workman Publishing Company, Inc. New York, NY , ISBN: 0-7611-3423-9

11. Page 68, , Younger Next Year, Christopher Crowley and Henry S. Lodge

Workman Publishing Company, Inc. New York, NY , ISBN: 0-7611-3423-9

12. Page 303, Men's Fitness Magazine Complete Guide to Health and Well-Being, Kevin Cobb, The Philip Lief Group, ISBN 0-06-273354-0

BIBLIOGRAPHY:

The Third Third, Tom Connally, MD Bright Sky Press, ISBN 0-9704729-2-7

Men's Fitness Magazine Complete Guide to Health and Well-Being, Kevin Cobb, The Philip Lief Group, ISBN 0-06-273354-0

Physical Activity and Aging, 2nd Ed. Roy J. Sheppard London: Croom Helm Publishing, 1987

Younger Next Year, Christopher Crowley and Henry S. Lodge Workman Publishing Company, Inc. New York, NY , ISBN: 0-7611-3423-9

Martial Arts After 40, Sang H. Kim, PhD Turtle Press, 2000 Wetherfield, CT ISBN: 1-880336-29-4