EXERCISE FOR SUCCESSFUL AGEING

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Ever been faced with training a previously sedentary older client? Jim Baker is about to take you through it step-by-step, while infusing his own feelings and years of experience into the narrative. He lets us step into his trainer's mind to give us a glimpse of his own personal guidelines on how to coach, protect and encourage older novice trainees. Jim paints detailed scenarios of a method that assumes nothing until the trainee is established and all the while working slowly and patiently toward the rewards of doing everything.

There's one thing we are entirely certain about regarding exercise for the elderly. Older adults are capable of vigorous long-term physical activity, including aerobic and resistance training, with positive adaptations. The benefits right from the start are profound. Even in the 60-90 group, training reduces the loss of muscle mass to less than 5% per decade.[1] This is as compared to 10% per decade around 30 years of age, increasing to 15 % in the 60's and 70's, and about a 30% loss thereafter. With aerobic and weight training exercises there is improvement in VO_2max, favorable cardiovascular adaptations such as reduced blood pressure, triglycerides, and LDL and increased HDL, as well as an increase of skeletal muscle strength, power and endurance. Quite simply, exercise training brings with it the consolation of an active and independent old age.[2]

JIM BAKER'S THOUGHTS ON COACHING OLDER ADULTS

"The needs of an Olympic athlete and our grandparents differ in degree, not kind. We scale the load and the intensity; we don't change the program. One is looking for functional dominance--the other for functional competence." ---Coach Greg Glassman

This early statement from our Coach is a really good starting place for us to talk about training older adults. When we talk about "universal scalability" in CrossFit we mean that the workout of the day (WOD) can be adjusted to accommodate age and fitness level, and that this should be done in a spirit of understanding that those things that are core to every individual are just as important to older adults. Having said that, there is, in my view, a lot more that goes into effective training of older adults than scaling down the WOD. So I'm going to highlight some of those points in our discussion today. While I recognize that this will just highlight some of the areas and is not a complete list by any means, I wanted to give you a flavor for my thoughts about working with older clients.

Introducing Your Older Client to CrossFit

When I first start working with an older adult, I want to learn about them and I don't want to be in a hurry with that. I want to find out how they heard about CrossFit, what motivates them to be here vs at the senior center or the other local gym and what general or specific concerns they have about the training and CrossFit workouts.

Physical history. I want to find out about their history of working out and any major illnesses or chronic pain that they may have. I'll ask women when they got their last bone density test and what the results were. For all my clients I want to know what meds they're on. If I don't know what they are, and lots of the time I don't, I'll ask them what the medication is for. As we chat, I'm gathering more and more information that gives me a general idea of issues I need to be mindful of during training. I'll also ask them to self-assess their fitness level in the areas of strength---how strong they think they are, how flexible, how good their balance is, and how they would grade their cardio.

Environmental history. They may have areas of concern related to their environment that we need to discuss. For example, are there issues around the home that become problematic for them—things that they're not able to do or need to ask someone to do for them, like bringing in the dog food or bringing in the bottled water or picking things up off the floor? We'll talk about these important functional issues in terms of crafting them into goals that, while working the broad spectrum of activities in CrossFit, we'll come back to so they can feel that success--that increased level of independence in the home.

Advice to Younger Trainers

The most important advice I can give to a younger trainer is--don't be in a hurry to get somewhere. Although we older adults are still concerned about our physical appearance, and rightly so, we are not doing CrossFit to be elite athletes, but to gain a level of physical vitality that lets us do the kind of things we want to do in life--around our home or traveling, and enjoying social and physical activities with friends. As an individual ages, the focus becomes more and more about being able to maintain the physical ability that will allow independence for as long as possible.

So, don't get hung up on completing an hour of training. Work with the person until the session is complete. Better to have the person leave feeling a little hungry than to work them until they're so sore or hurt that the possibility of them coming back to train again is not great.

Younger trainers may have a tendency to take their own level of fitness for granted and make assumptions about their older clients, especially in the areas of strength, flexibility, and balance. The younger trainer can easily execute moves without thinking about the fact that getting up and down off the floor could be problematic for an older person . The trainer may also forget that their own ability to easily execute a move is because their own flexibility and balance allows them to do so.

Starting Training

After taking the history of my clients' physical, health, and environmental status, I tell them that the first couple of sessions are going to feel a little schizophrenic. I'll be asking them to do a variety of things that they might not have done for some time and it gives me an opportunity to get to know how they move.

I start with some basic long dynamic stretching, moving the shoulders, knees, ankles and neck For some people who are really deconditioned, that could be the first training session. We'll work with some basic throws with the 4 lb ball. I'll watch their movements and note the fluidity or rigidity. If, during the training, they tell me that they're feeling weakness or pain in their legs, that will be the indicator for me to just back off, chat a little, let a little time go by and then start another activity.

We usually go for a walk. Even if the person is fairly fit, we'll still walk. They'll tell me "I jog", and I'll say "Well, let's just walk." We'll walk and talk and I'll be monitoring their breathing pattern and pick up the pace as they show me that they're comfortable with the speed. If, for example, we're doing a loop, at the first turn we might jog to the corner and walk again. I'm just wanting to get a sense about, not only their cardio, but what they look like when they move. Are they hesitant, looking down, or jerky in their movements? All are indicators to me about where we're going to go next.

How to guarantee success. When we come back to the gym, we might look at squatting. Even if I know that the person is fairly fit and they can squat, I want them to do a couple of things prior to actually squatting. For example, I'll ask them to hold on to the handles of the glute-ham developer (GHD) and give me a partial squat, then a full squat, still holding on. After that, we leave the GHD and they'll squat to the high box and I'll slowly ratchet the level of the box down, so that at the point at which they "hit the wall" (either their form has diminished or they're just not able to do it) they still have two—maybe four or five things under their belt. Then, at the end of the session, I can say, "Look, you were able to do this" rather than: "Here's the five things I asked you to do, of which you could do none." It's important, especially at first, when you're asking them to do a broad spectrum of activities and they begin to confront failure that you schedule it and coach it so that you make sure there are activities that you know they can do before they "hit the wall."

The challenge of getting up off the floor. After the squat, I might ask them to lunge. And again, they would be holding onto the handles of the GHD and alternating legs. If they're able to do that, after making sure that everything is clear around them, I'll give them my hands and ask them to come out of a lunge. If they can do that, I may just give them two fingers. And so I'm working them toward an independent lunge. Being able to get up off the floor is a valuable activity for independence and the time spent perfecting the move is well spent. We work it not only in terms of the lunge, but also in terms of kneeling with both knees down **to** pick something up off the floor and coming back up out of that position, utilizing both legs.

Evaluating range of motion. For the shoulders, I ask them just to raise their hands over their head. I won't even use the stick at first and they'll

show me the range of motion in their shoulders. This will give me the indicators of where we need to go as it relates to opening those shoulders up.

Important Physical Domains for the Older Client

Of the domains in CrossFit that we focus on, the ones that are paramount for the older clients are balance, flexibility, strength, and cardio-fitness. Not that the others don't have value, but that there are numerous benefits for the older adult in these four domains.

Balance and flexibility. Many of the younger clients will have an innate level of balance and they may have flexibility as well. Balance and flexibility are the issues that, within the coaching session, we skill drill. Like Coach Bergner's skill drills for "O" lifting, we skill drill for balance and flexibility.

The balance drills are both static and dynamic. In the areas of dynamic balance you want to get people used to doing a variety of activities they probably haven't done since they were kids, such as skipping or hopping or jumping.

The flexibility drills involve getting up off the floor, presuming the person can do that, and getting down to pick something up at varying heights that are also over, under, and around objects---just moving the body in ways that we might not have done over time and as a result are fairly inflexible.

Jumping. When it comes to jumping, you don't want to give your client the box. Instead, put a piece of tape on the floor and just have them jump over the tape. Get them used to getting their feet off the ground, landing solid, protecting the knees from shock, training them before you even think about asking them to jump up onto something.

The next step would be to support a length of PVC pipe with a 5 lb dumbbell on either end, and ask them to jump over the pipe a few times before adding additional height. Then we may want them to jump up onto something, preferable not the box. If it is the box, build up the floor underneath them for the first few jumps and then pull the plates out so that they are increasingly working the height, but not hitting the full height right off the bat.

Scheduling the WOD

I'm not a great fan of high reps single movement workouts---such as 150 wall balls for time. It's just too hard on old joints. I much prefer a couplet or a triplet, short rest, and pick up another one---so that over the course of your time together, they've had a broad spectrum of exposure to a variety of physical stimuli.

The lesson plan. I always have a lesson plan, but I'm not wed to it. I have in mind what I'm going to do, but if the person comes that day and they're feeling achy and creaky in a particular area or what I'm seeing in their body language is incompatible with my lesson plan, then the lesson plan goes out the window, but I always bring one with me to be prepared.

A full workout session. My idea of a good session after the person has been established is to begin with some dynamic stretching that parallels the activities we are going to do, followed by an instructional phase on something that we are currently working on. They would then do two sets of couplets or triplets, a rest, maybe another set, ending with some balance work and then some static stretching. That to me really rounds out a full workout session for the older client.

I'm going to end with a statement that Coach Glassman made at the original box at HQ when he was talking to the trainers. He said: "To be an effective trainer you really have to get under your client's skin." And what I took from that is that when we commit ourselves to a client, we're committing ourselves for the long haul for as long as they want to and are capable of working out through good times and challenging times. This, for me is the excitement, the challenge and the privilege of being a CrossFit coach.

RESISTANCE EXERCISE DEFINED

Scientific studies of the affects of exercise on aging refer exclusively to aerobic and resistance exercise. We all know what aerobic exercise entails, but the definition of "resistance exercise" may be somewhat uncertain for some of us. Since we will be using that term in deference to the literature on the subject of exercise, we will define it here.

Resistance exercise focuses on the development of musculoskeletal strength and includes weight training. At CrossFit we combine resistance exercises,

aerobic conditioning, and flexibility exercises into an overall training program. Resistance exercise uses weight training to generate the forces necessary to create resistance against which the working muscles can act. Although we lift weights at CrossFit, the term, "weightlifting" is reserved for the competitive sport and is distinct from resistance exercise.

At the core of resistance exercise is the principle of overload→fatigue→repair→growth. The progressive increase of a load (resistance) applied to a muscle, results in muscle fatigue. With rest, the body activates the repair process, causing muscles to grow stronger. Resistance training, in addition to providing our bodies with more power and being essential to total fitness, is specific for better bone mineral density.

While resistance training most often involves the use of weights to provide the necessary resistance, other training aids can be effective. Sprinters use parachutes or similar devices to create additional drag on their bodies to increase the resistance to their leg muscles. Football linemen for many years have used blocking sleds and tackling sleds to simulate resistance they encounter during a football game.

NORMAL AGING

Well, the news isn't super good here for sedentary folks and the functional slide begins at age 40, accelerating after 65-70, with structural and functional decline in most physiological systems--even in the absence of discernable disease.[1]

There is no consensus in the literature as to when "old age" actually begins.[2] It would seem that exercise training makes us feel physiologically younger, although there's no denying the chronological age. Shall we, for our own purposes, at least say if you eat right, exercise vigorously over the long term, don't smoke, avoid second hand smoke, and have fantastic genes that at any age one is "less old"?

Physical Function

Cardiopulmonary fitness. A decline in cardiopulmonary (heart and lung) fitness begins to accelerate after 45 years of age, but more so in people who are disproportionately large, sedentary, and/or smokers. In a study funded by the National Institutes of Health from 1974 to 2006, involving an

amazing number of people---20,318 men and women across 32 years, it was shown that this decline is influenced by lifestyle and is associated with risk of diseases and dependent living.[3] Nothing new about that, but perhaps in 1974 it was a mystery.

Heart rate. Older people have a slowed heart rate at the beginning of exercise. This and other factors, such as a decline in the amount of blood pumped from one ventricle with each beat of the heart (stroke volume), cause a reduced exercise capacity.

Oxygen uptake. A study of the literature on exercise and aging gathered by the American College of Sports Medicine (ACSM)[2] reported a decline in peak oxygen consumption per unit of time of 3% to 6% per decade for those in their thirties and forties. In healthy, sedentary adults there's an average decline of 9% per decade, accelerating with age. After 70 years of age, the rate of decline accelerates to more than 20% per decade.

The elderly work harder at breathing during exercise because the exchange of CO_2 for O_2 across the alveolar membrane is compromised by a loss of alveoli and a reduced alveolar membrane surface for the exchange. However, pulmonary aging does not limit our exercise capacity, except in the elite athlete. If we maintain a low body mass index, are physically active, and don't smoke, we will have a higher cardiopulmonary fitness across the adult life span. In fact, although systemic oxygen uptake is slower in the older adult as opposed to the young, causing early fatigue, we can actually adjust for this age difference with a proper warm-up.

Walking and climbing. Walking speed slows, stride-length shortens, gait varies and the metabolic cost increases in older sedentary adults. When climbing stairs, step height is reduced, reflecting leg strength and coordination. The deficits in both walking and climbing are compounded by a deficit in balance and of course, may be improved simply by--well, walking and climbing. Dancing would be the best and most enjoyable of all.

One study[4] evaluated the association of a 400-meter walk with 6-year all-cause mortality. They looked at total walking time, lap time coefficient of variation (lap time CV, in percent), rest stopping, and the inability to complete the walk. Resting at least once but not more than two times and still completing the walk within 15 minutes identified rest stoppers. Risk of death during the 6-year follow-up period was three-fold higher for those

unable to complete the 400-meter walk compared with those who completed the test. It was four-fold higher for those in the slowest quartile[‡] of walking time compared with those in the fastest quartile; 30% higher for each minute increase in walking time; and two-fold higher in the quartile with highest variation in lap times compared with the quartile with lowest variation in lap times. Makes you want to get out there and walk fast or run!

Although of interest in evaluating longevity, the study on the 400-meter walk test should not be taken to mean that walking, especially low-density walking, will protect from osteoporosis. It has significant positive effects on lumbar bone mineral density, but not on the bone density for the femur or the calcaneus (heel bone). Thus, aerobic and weighted exercises should be part of an exercise routine for both women and men.[5]

Balance (again!). In seeking exercises that will improve balance in older adults, let's compare the dreaded treadmill with the exercise bike. If you have this choice for a warm-up, it is best not to choose the exercise bike because it provides no balancing issues. You are holding on and you are stable; the same can be said for the Stairmaster Freeclimber. On the treadmill you are constantly making fine muscle adjustments to maintain balance as you walk or run in-place--unless of course, you hold on. For improving your balance, the treadmill is a much better choice than the stationary bike for your warm-up.

For an elderly person with balancing issues the first warm-ups on the treadmill should be holding on and gradually over time, decreasing the strength of the hand-hold on the bars until you eventually release the hold, keeping your hands just over the bars. Work that way until, eventually, you are able to walk fast or jog without even looking like you need to hold on!

When the treadmill is compared to walking outside, it's still the better choice for balancing. On the treadmill you are essentially standing still and making adjustments for balance as the surface moves under your feet--a good balancing act. Outside, you are propelling yourself through inertial space and your forward motion helps you to balance while walking or running, assuming even terrain. So, if the treadmill is available, it is a better choice for improving your balance. Of course, when walking or hiking across

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[‡] Quartile. *n.* The value of the boundary at the 25th, 50th, or 75th percentiles of a frequency distribution divided into four parts, each containing a quarter of the population.

uneven terrain, the fine muscle adjustments come into play. One does not generally see a treadmill in a CrossFit gym; it is simply not something that fit young people (<65-70) need. However, if you are acquiring more and more elderly clients, especially those who come to you from a sedentary life-style, you might want to consider it.

Flexibility and joint range of motion. By 70 years of age, especially for women, muscle and tendon elasticity decreases to such an extent that hip and spine flexibility decline 20-30%. Ankle flexibility declines 30-40 %.[2] All of us, including the young, need to work at flexibility and range of motion.

Muscle Mass

"Older adults are not necessarily weak adults", says Mark Rippetoe while showing a picture of a 72-year-old man with powerful muscles and a beautifully executed 402-pound deadlift![1]

At around 40 years of age, muscle mass begins to decline. The decline accelerates after 65-70, with the legs loosing muscle mass faster than the arms. A reduction of Type II fiber size results in reduced muscle speed and power.[2] However, older resistance trained adults increase their strength, have a higher muscle mass, are generally leaner[6] and are 30%–50% stronger than their sedentary peers.

Compared to age-matched aerobic athletes, resistance trained athletes have more total muscle mass, higher bone mineral densities[7] and maintain more muscle strength and power .[8] Most studies suggest that increases in strength and power after resistance exercise training are greater than would be expected in older men and women based upon changes in muscle mass alone.[9-11] This is especially true during the earlier phases of training.[12, 13]

Bone Mineral Density

Bone mineral density peaks in the mid to late 20s and declines 0.5% or more per year after 40 years of age.

Older women. After menopause, there is a disproportionate loss of bone (2-3% per year), which of course increases the risk of fracture. At this point in a woman's life, there is no question that weight bearing aerobic and anaerobic exercises should be an important part of her life. Remember, as

already mentioned, low-density walking won't protect our bones. Brisk walking, stair climbing and descending, walking with weighted vests or jogging have more significant positive effects on bone mineral density,[14] but it's the resistance training that gets it done.

Older men. Sherk, et al [15] did age comparisons of bone density and geometry in men and found that tibial bone mineral density was significantly lower in healthy 50-64 year old men compared to 18-30 year old men. In this study, there was no mention of activity, but the fact that at the "youngish" ages of 50-64 years the loss of bone mineral density was considered "significant" flies in the face of the generally accepted notion that it is the women who are at risk for osteoporosis. Certainly, the risk is disproportionately higher for postmenopausal women than it is for men, but the men need to take care too, so that their bones will be strong for a lifetime.

Another recent study[16] looked at the preservation of bone health into very old age in both male and female subjects. To do this they compared 33-94 year old men and women sprinters, runners and race-walkers with sedentary individuals in the same age group. No surprise, it was the athletes who had the greater bone mineral density, proving that men and women can preserve their good bone health into old age and that bones adapt to the forces of exercise throughout the lifespan.

Reaction Time

No doubt about it, reaction time increases, especially after 65. However, exercise can soften this decline.

The 70s and 80s in active people--a personal note (MC). I asked my husband if reaction time had increased for him. "*I used to be quick as lightning and twice as dangerous*" was his instant reply. He hastened to seriously add that he has "no quantitative measure for it." But I believe that he does have a way to measure because, at age 76, every day he is gone for 1.5 hours hiking a steep slippery canyon face into a wooded area with rocky stream beds and log-strewn terrains that change with storms and big winds and require accurate footing, high step-ups and duck-unders, all of which take quick reactions to avoid injury. He's fast, steady, and so far, uninjured. His time for the hike is the same as it always was.

Billy, the skier. Men and women in their 70s and 80s can be found on the ski slopes and can be seen hauling their equipment on their shoulders up and down stairs, and onto the snow to click into their bindings and ski-skate to the lift. An 84 year old, Billy, would occasionally ski a black diamond run (steep) and was looking forward to age 85 when he would qualify for a free season pass at Mammoth Mt in California; he was a colorful and well-loved part of "The Mountain." Apart from all the physical moves, reaction time is especially important in skiing. Billy never seemed to be compromised, his active life and exercise compensated. Sadly, when returning home from skiing at age 84, the SUV he was a passenger in, rolled on the icy road. Billy never really knew "elderly-ness." In mourning him and celebrating his love of life—many of us expressed sorrow that he had missed by one season the long anticipated joy of "skiing free" with that long-awaited complementary pass hooked to his well-worn parka.

SKELETAL MUSCLE FATIGUE IN AGING MUSCLE

There is a recent interesting study by Hirai et al[19] on the impact of aging on contraction and relaxation of skeletal muscles in rats. It appears that there are aging-induced alterations in peripheral circulatory control in skeletal muscles. During contractions there is a reduction in the partial pressure of oxygen in the micro-vasculature, resulting in changes in the speed of contraction and relaxation of the aging skeletal muscle-- contraction is faster and relaxation slower than in the young skeletal muscle where the reverse is true--slower contraction, faster recovery. Hirai and his associates believe that such a sequence in elderly skeletal muscles likely compromises muscle metabolic recovery and causes premature fatigue.

Perhaps we can conclude from this study that the reason for the age-related drop in intensity of our workouts that we are well acquainted with as we move into our mid-60s, is a reduction in the partial pressure of O_2 in the peripheral arteries of our skeletal muscles. With less O_2 to the aged muscle, recovery time is longer and fatigue hits sooner than for the young muscle.

We don't know if one could counteract this aging-related decrease in the partial pressure of O_2 in the microvasculature of skeletal muscle with diaphragmatic breathing, but it wouldn't harm. It's a good idea to concentrate periodically during the day on inflating all of those little air sacs (alveoli) and perhaps prevent the ones at the end of the "air-feed" from collapsing as we age. When we have a cold or the flu, deep breaths and

ambulation prevent fluid from accumulating in the alveoli and becoming infected (pneumonia.) Loss of alveoli reduces surface area for O_2 and CO_2 exchange in the lungs.

Ageing Mitochondria

Mitochondria are microscopic energy units within all of our cells. They are equipped with their own DNA code and, among other functions, they control the energy supply to muscle cells. It has been established that the impairment of mitochondrial function is associated with various disorders, such as type 2 diabetes and Alzheimer's disease.[20] In addition, a multitude of studies connect increased mitochondrial dysfunction with cell death in ageing skeletal muscles.

A group of Canadian scientists has published an interesting study showing that this mitochondrial dysfunction and cell death is reflected in a ”gene expression profile" in the skeletal muscles of healthy older adults, compared with young individuals. This study also demonstrated that a consistent resistance exercise program reverses many aspects of this age-related genetic dysfunction and weakening of skeletal muscles.[21]

There were 26 young adults (20 to 25 years of age) and 25 older adults (>65 years of age) participating in the study. The resistance exercise training lasted for one hour, biweekly (Monday+Thursday, or Tuesday+Friday) for 26 weeks.

At the end of the program, the older adults improved their strength significantly compared to the young adults. Before the program the older adults were 59 per cent weaker than the young adults. After the program they were only 38 per cent weaker. Melov and colleagues concluded that their results "strongly supported the notion that mitochondrial dysfunction is linked to ageing in humans. But the exciting discovery was finding out that resistance training reverses many aspects of this."

VIGOROUS LONG-TERM PHYSICAL ACTIVITY FOR OLDER ADULTS

”Adults aged 65 and older, gain substantial health benefits from regular physical activity, and these benefits continue to occur throughout their lives.”[17]

Studies on aging CrossFit athletes, as far as we know, do not exist. What we do have are the evidence-based conclusions from the ACSM relative to exercise and physical activity for older adults.[2] Here are three of them:

1) A combination of aerobic and resistance exercise training seems to be more effective than either form of training alone in counteracting the detrimental effects of a sedentary lifestyle on the health and functioning of the cardiovascular system and skeletal muscles.

2) Although higher-intensity exercise has clear metabolic and performance benefits for older adults, "it is now evident that such programs do not need to be of high intensity to reduce the risks of developing chronic cardiovascular and metabolic disease." However, higher-intensity exercise has better treatment outcomes for some established diseases and geriatric syndromes, such as type 2 diabetes, clinical depression, osteopenia, sarcopenia, and muscle weakness.

3) Ideally, exercise for older adults should include aerobic, muscle strengthening, flexibility and balance exercises.

RECOVERY TIME

"*It is important to understand that the trainee is not getting stronger during the workout. He is getting stronger during the recovery period after the workout. The next logical step is to increase the workload in the next workout – i.e., to employ simple progressive overload.*" *--Mark Rippetoe*

The subject of recovery time for the elderly during the course of exercise training is simply not covered in the literature by the scientists who are actually running tests and writing about human exercise and aging—at least not that we have found. We've personally contacted such authors and they have no idea—none, nor do they seem interested. Even the ACSM, in a 20-page "position stand" on physical activity for the elderly, recovery time is mentioned only once. They say that the effects of age on mechanisms of fatigue are unclear and task-dependent, but "may impact recovery from repetitive daily tasks."[2] Not much help there.

In spite of the fact that recovery is incompletely or seldom addressed in the scientific literature, it is an important facet of training in that not only do we gain strength from it, but we avoid overtraining. We do however, have two elegant resources, the CrossFit Journal[18] and *"Practical Programming for Strength Training"* (Rippetoe and Kilgore).[1] In the Rippetoe/Kilgore book, recovery is covered in detail at every stage of development—novice, intermediate, advanced, and elite. There is also a section in that book that addresses recovery time for "Masters". Rip makes the point that recovery capacity lessens over the years and that coaches and trainers need to pay attention to that and the starting fitness level in trainees.[6] Disruption of homeostasis and recovery time are elite concepts in coaching serious trainees at every level and age. I'd sure get my mind around this if I were a coach or trainer.

Personal Accounts About Recovery

A few of our older adults in our local CrossFit community agreed to summarize their workout experience, which should give you a sense of their self-imposed recovery times as well as fitness levels. Their personal accounts are interesting and unique.

57 year old female: I have been training w/ Eva T. from the beginning. So how long does it take for me to recover from an Eva workout? Great question! It depends largely on the workout for me. If it's a really hard workout, it could take me 2-3 days. The ones I feel most are those with excess effort in my chest, arms or legs (quad/hammie).

58 year old female: I am 5ft 2in.. 110 lbs, fitter than most. I usually do 4-1 [4 days WO/1 day rest], sometimes 5-1 and recover fast because during the week, I go back to work or go walk my dog immediately after a work out. I have 5 real pushups, 1 real kip pull up, back squat 73lbs 21 reps x3, dead lift 103.

62 year old male: My general schedule is two days on, one off, then three on. On my last day I kick box. This is highly dependent on the workout. I am always looking for a balance in the week of metcom and strength work. If I get really sore or my attitude starts to suck I will take a few days off. I am always thinking about training my mind and body for the long term. <This man was too humble to state his lifts, so someone else is doing it: deadlift 309 lbs, back squat 220 lbs, snatch 109 lbs, clean & jerk 156 lbs, 24 pull-ups, 48 push-ups.>

55 year old male: I've had 5 1/2 years at CrossFit. I usually go 2-1 or 3-1. As for fitness level, I would assume, age considered, "very fit" would apply. My deadlift is 345, clean 195, snatch 140, clean and jerk 190, OHS 190, and I have 25 pull-ups and 47 pushups.

56 year old male (in-workout recovery times) In terms of short recovery I just try and get through the workouts and rest as needed in order to continue. Most of the time my cardio vascular system betrays me before my muscles fail. If we are doing some sort of interval routine or heavy lifts a 3 minute rest works well for me. Sometimes I need to wait longer depending upon the work that will be required. I have 3 boys - 23, 7 & 6, and a wonderful wife. I work hard to stay ahead of the 23 year old. He has been cross fitting for awhile now, and I'm losing ground. Then the little boys challenge me all of the time so I have to work hard to keep up with their energy!

67 year old male: I've been at CrossFit four years. I work out on Mon, Wed, and Friday, 3 days a week. I do all lifts--different weights for different sets. For instance, today we ran 400 meters and then did 5 dead lifts in a row. We did this 3 times with 5 minute rest in between. I lifted 147 pounds and each run was right around 2 min 5 sec. I use bands for pull-ups and dips.

68 year old male: I workout once a week and started in January 2009. I think I'm semi-fit. My recovery time depends on the workout, most of the time it takes about 48 hours to re-coup but if the training day consists of a lot of squats it can take up to 72 hours.

78 year old female: I try for three on-one off for my workout schedule, but sometime workout 5 days in a row with two off. I would rate myself "semi-fit". My working weight for bench press is 45 lbs, clean 37.5 lbs. My deadlift PR is 95 lbs. I need help with my pull-ups, I do only "climb-downs" on the rope and "old lady push-ups" (never able to meet the ground unless I collapse!!); I walk fast and run a little--not fast and not far. I want one honest pull-up before I'm 80--coming up fast!

LIFESTYLES OF CENTENARIANS

"...*those* pioneers *who have shown us the horizon of the human life span."*
Thomas Perls M.D., Harvard Medical School

The American College of Sports Medicine found three behaviors that were routinely reported in centenarians. They are: regular exercise, a social network, and a positive mental attitude.[2] Other studies add resilience to loss and engagement in a project they are devoted to—simple and sublime such as taking care of a garden or designing inspiring and beautiful buildings. One woman taught aerobics—one was a physician and still in practice in a rural community. All had resilience to loss. They had outlived their loved ones and survived emotionally and physically.

102, still working and enjoying life. A living example of a centenarian who is enjoying life and hard at work is Brasil's most famous architect, Oscar Niemeyer, who celebrated his 102nd birthday on December 15, 2009,

is still engaged in projects he loves and is still his own man: “I must design what pleases me in a way that is naturally linked to my roots and the country of my origin.” This feisty guy designed Rio's Sambadrome and the Museu de Arte Contemporânea de *Nitro* and many of the futuristic edifices of capital Brasilia. His inspiration for the dome’s curves and sweeping lines was "the body of the Brazilian woman." From his studio overlooking Copacabana beach, he is now managing the renovation of the central avenue of the Sambodrome, where the most famous of Brazil's glitz-and-flesh Carnival parades are held. He also is planning a “Niemeyer Complex” for a town across Rio's bay as well as the Aviles International Cultural Center in Spain. Oscar Niemeyer continues to flaunt his love of life, enjoying his work, his 64 year old wife, whom he married in 2005, and his cigars -- "an old habit that I cultivate with much gusto."

Chronologically it can’t be true that “you’re only as old as you feel.” But it is true that those who stay fit do indeed “feel” younger than they actually are and have a really good shot at successful (healthy, strong) ageing. It is also true that fit or not, an aged person will tell you that he or she still “thinks young”---still feels “inside” like the same person that they were at 25 or 30. So beware--those deep wrinkles may hide a 25-year-old spirit with 65-102 years of experience in life and love!

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