

**“4 x 13” Project**  
**You Can Get There but You have to Walk**  
**By James L. Holly, MD**  
**Your Life Your Health**  
**The Examiner**  
**September 24, 2009**

As I approach my 66<sup>th</sup> birthday, I have thought of a number of things which I want to see before the end of my life and I have calculated the age which I will have to obtain in order to have the possibility of experiencing those things. Additionally, I have thought about what I must do in order to improve my chances of reaching those age sign posts. And, of course no one wants to reach advanced age without their cognitive abilities in tact so not only do I have to live to a particular age; I have to do that with my mind in tact, or as much in tact as it has ever been. There, that should take care of any tacky jokes (smile). What do I want to do before my life is over?

- I want to see all of my grandchildren graduate from college and marry. My youngest grandchild is 1 year old, so in order to do that I will have to live, with my mind in tact, another twenty-three years which would make me 89.
- I want to celebrate my 75<sup>th</sup> wedding anniversary with the “bride of my youth.” That would require me obtaining the age of 96.
- I want to see my grandchildren’s grandchildren. That is probably not going to happen except possibly with my oldest grandchild who is 16. To potentially see my great, great grandchildren, or some of them, I will have to live at least 33 more years or to the age of 99.
- I want to see what the changes which SETMA has helped bring to healthcare delivery – particularly in regard to electronic patient management – will evolve into by the midpoint of the 21<sup>st</sup> Century. That would require me obtaining the age of 107. Well, that’s pushing it, but it would be exciting to see where all of the things we are doing will take us. I will probably have to leave that to my younger partners or even to my grandchildren.

The balance to these desires is the confession that if I do not reach all or any of those milestones, I should and will have no complaints. In fact, though it is my hope, prayer and confidence that it will not be the case, if I died tomorrow, I have been blessed with a full and wonderful life. We should always balance our expectations, or desires with a strong spirit of gratitude for what we have. A friend of mine wisely said, “If you are not content with what you have, you will never be happy with what you want.”

### **The “4 x 13” Equation**

But, what does all this have to do with the equation “4 x 13?” Of course the product of 4 x 13 is 52, which happens to be the number of weeks in a year. But, again, we ask a question, “What does that have to do with how long one lives or how one can preserve one’s mental function for as long as one lives?” Well, for me, it started on June 21, 2009, when I began walking five miles every day.

The reality is that I have exercised for years, but had to stop running when I wrecked my right knee over 20 years ago horsing around. I could walk but I could no longer run without my knee swelling. As first, I complained but then I realized how grateful I was that I could still walk. It was June of 2006, when I contracted West Nile Virus and it has taken a while to get back to the level of aerobic fitness which I had reached at that time. In fact, my exercise regimen on the treadmill was so rigorous as to speed, distance and incline that when my West Nile symptoms occurred, I at first thought that I had only “overdone” my exercise. When my fever passed 103 and approached 104, it was obvious that that was not the problem. Even though I am a doctor, it was my wife who first said, “I bet you have West Nile.” She was right.

I had never walked “every day” for an extended period of time, because I worked at exercise so hard that after three or four days, I had to rest my legs in order to continue. To avoid that, I slowed down a little. After my vacation, I had walked 21 days straight and thought that I might as well continue. When I passed 60 days straight, I had walked the distance from Beaumont to San Antonio, so I thought I might just as well walk back to Beaumont. As of Sunday, September 20<sup>th</sup>, I am over half way back from San Antonio. I have walked over 460 miles. Interestingly, my speed has gotten back to where it was and my distance varies from 5.5 miles every day to six miles some days, and on several days, I have walked 11 miles.

Last Sunday also completed my 13<sup>th</sup> week of walking every day. Now my goal is to walk every day until June 21, 2010, thus the “4 x 13” equation. I have walked at least five miles a day for 13 weeks, if I do that four times, I will have walked at least five miles every day for 52 weeks. If I succeed I will have walked 1825 miles in 365 days, and if you do an accurate count of distance I will have walked over 2,000 miles.

### **What does it take to succeed?**

Succeeding in this process for 365 days will take the same creativity and persistence as it took me to succeed in the first 91 days. For instance, on Friday, September 18<sup>th</sup>, I flew to Dallas to speak at a medical meeting. Because the meeting went from noon until 10 PM Friday once I got there, there would be no time to exercise that day. And because, I had to leave for the Houston airport at 6:30 AM, well, I had to start my exercise very early. When I got up at 2:30 AM to go do my 5.5 mile walk at the Wellness Center track, my wife suggested that I might get knocked in the head. Having done it several times earlier for similar scheduling reasons, I felt that I was safe and I was.

Of course on Saturday, our meeting in Dallas started at 7:00 AM and I was the first speaker. And, as the meeting lasted until, 3:00 pm and then we rushed to the airport to catch a plane back to Houston to arrive in Beaumont by 7:30 PM, I had to get up early again to do my walk, but not quite so early as on Friday. The walking track at the hotel was different from Beaumont. Though I live in community whose name means “Beautiful Mountain,” it is at an elevation of 16 feet above sea level. As I walked on Saturday morning at 4:30 AM, there were hills. One required walking bent over and

leaning forward to ascend the sharp incline. I knew how high that hill was when a herd of Mountain Goats came by and inquired as to why I was on their “mountain.”

### **Preserving Cognitive Ability**

But what does my desire for longevity and cognitive ability have to do with this “4 x 13” exercise project? The word “exercise” derives from a Latin root meaning “to maintain, to keep, to ward off.” To exercise means to practice, put into action, train, perform, use, improve. Exercise is a natural part of life. Prior to the 20<sup>th</sup> Century, “exercise” was a part of living. These days we have to consciously include exercise in our daily routine. What is now considered a form of exercise – walking – was originally a form of transportation.

Walking is especially good for your brain, because it increases blood circulation and the oxygen and glucose that reach your brain. Walking is not strenuous, so your leg muscles don't take up extra oxygen and glucose like they do during other forms of exercise. As you walk, you effectively oxygenate your brain. Maybe this is why walking can “clear your head” and helps you to think better. However, even walking can be strenuous depending upon your speed, the incline of your surface and/or the distance you walk. Above 4.5 miles-an-hour, while possible when walking, is considered the speed of slow jogging. Moderate exercise is above 3.0 miles per hour.

### **Improving Mental Ability with Exercise**

Movement and exercise increase breathing and heart rate so that more blood flows to the brain, enhancing energy production and waste removal. Studies show that in response to exercise, cerebral blood vessels can grow, even in middle-aged sedentary animals. Studies of senior citizens who walk regularly have shown significant improvement in memory skills compared to sedentary elderly people. Walking also improved their learning ability, concentration, and abstract reasoning. Stroke risk can be cut by 57% in people who walked as little as 20 minutes a day.

When the cognitive abilities of elderly women were compared, those who walked regularly were less likely to experience age-related memory loss and other declines in mental function. The University of California at San Francisco researchers measured the brain function of nearly 6,000 women during an eight-year period. The results were correlated with the women's normal activity level, including their routine walking and stair-climbing. The higher-energy groups had much less cognitive decline. The study showed that it wasn't a matter of all or nothing. For every extra mile walked per week there was a 13% less chance of cognitive decline. So you don't need to be running marathons. The exciting thing is there was a 'dose' relationship which showed that even a little is good but more is better.

Physical exercise has a protective effect on the brain and its mental processes, and may even help prevent Alzheimer's disease. Based on exercise and health data from nearly 5,000 men and women over 65 years of age, those who exercised were less likely to lose

their mental abilities or develop dementia, including Alzheimer's. Furthermore, a five-year study at the Laval University in Sainte-Foy, Quebec suggests that the more a person exercises the greater the protective benefits for the brain, particularly in women. Inactive individuals were twice as likely to develop Alzheimer's, compared to those with the highest levels of activity (exercised vigorously at least three times a week). But even light or moderate exercisers cut their risk significantly for Alzheimer's and mental decline.

Since 1956, the Seattle Longitudinal Study has tracked more than 5,000 people, aged 20 to 90 years old. When participants began to experience cognitive decline, they were given a series of five one-hour training sessions designed to improve inductive reasoning and spatial orientation. As a result, half of them improved significantly – demonstrating that mental enrichment increases intelligence at any age. The results of the cognitive training studies suggest that the decline in mental performance in many community-dwelling older people is probably due to disuse and is consequently reversible.

Certain areas of the brain, however, are more prone to damage and deterioration over time. One is the hippocampus, which transfers new memories to long-term storage elsewhere in the brain. Another vulnerable area is the basal ganglia, which coordinates commands to move muscles. Research indicates that mental exercise can improve these areas and positively affect memory and physical coordination.

Numerous studies show that better-educated people have less risk of Alzheimer's disease. In a Case Western Reserve study of 550 people, those more mentally and physically active in middle-age were three times less likely to later get the mind-robbing disease. Increased intellectual activity during adulthood was especially protective. Examples included reading, doing puzzles, playing a musical instrument, painting, woodworking, playing cards or board games, and performing home repairs.

Blumenthal and a team of researchers at Duke University Medical Center found that an aerobic exercise program decreased depression and improved the cognitive abilities of middle-aged and elderly men and women. They followed 156 patients between the ages of 50 and 77 who had been diagnosed with major depressive disorder. They were randomly assigned to one of three groups: exercise, medication, or a combination of medication and exercise. The exercise group spent 30 minutes either riding a stationary bicycle or walking, or jogging three times a week. After 16 weeks, all three groups showed statistically significant and identical improvement in standard measurements of depression, implying that exercise was just as effective as medication in treating major depression.

In a sedentary group of people aged 60 to 75, University of Illinois researchers introduced them to a fitness regime. For six months the elders had either an aerobic or non-aerobic workout for up to 90 minutes, three times a week. The 214 healthy adults hadn't been involved in any physical exercise for the previous 5 to 10 years. Most hadn't done any formal exercise for 30 or 40 years. One group took long walks three times a week, and the other only did gentle toning and stretching exercises using weights. Walkers, who completed an hour-long loop around the university, improved significantly

in the mental tests, as well as being fitter. An improvement of only 5-7% in cardio-respiratory fitness led to an improvement of up to 15% in mental tests. The non-walkers, however, did not gain any benefits for their brains.

Even beyond age 70, cardiovascular exercise can improve memory and reasoning skills. People who have chosen a lifetime of relative inactivity can benefit mentally from improved aerobic fitness. It's never too late. By improving cardiovascular health, exercise increases the flow of oxygen-rich blood to the brain. Over a lifetime, this makes a big difference to brain function. In fact, cardiovascular health appears to be the primary biological reason why elderly women tend to have better cognitive function than men.

### **Conclusion**

I think I will just walk to my grandchildren's weddings. I'll start today. Is there something you want to do before your life is over? You can get there but you have to walk.