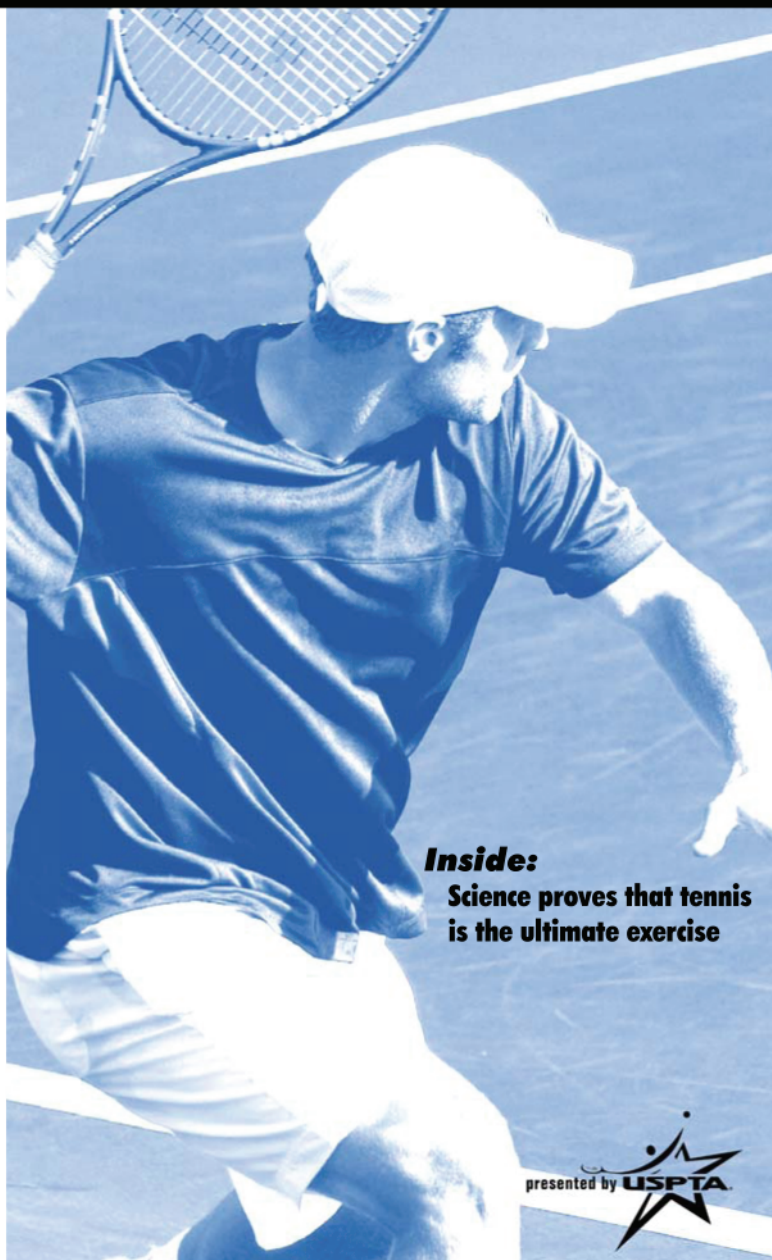


# TENNIS - FOR THE HEALTH OF IT!<sup>SM</sup>

# TENNIS



***Inside:***

**Science proves that tennis  
is the ultimate exercise**



# TENNIS - FOR THE HEALTH OF IT!<sup>SM</sup>

by Jack Groppel, Ph.D., and USPTA

*Tennis – for the health of it!* is the new public relations initiative of the United States Professional Tennis Association. It is part of the organization's larger PR campaign that focuses on "Who We Are" as a means of promoting USPTA's certified tennis-teaching professionals.

Tying together the messages of health and fitness and "Who We Are" is very easy for USPTA, the oldest and largest organization of tennis teachers and coaches in the world. As the tennis delivery force, USPTA members have the expertise to promote the message that tennis is good for you and can deliver the programs to help students get fit and healthy. Whether you already play the game or are new to tennis, you can choose to participate in many tennis-related programs, including structured lessons, league and other competitive opportunities, fitness-based events, drill sessions or just plain fun activities.

## **Why tennis and who should play?**

The reasons for playing tennis are many and are listed and explained in this booklet. As for who should play, the answer is anyone – at any age and at any skill level. The following describes several groups of people and how, based on their stage of life, they can enjoy both the physical and psychological benefits of playing what many people call "the sport for a lifetime." To see for yourself how science has proved that tennis contributes to health and fitness, keep reading!

**YOUNG CHILDREN** (or their parents, who are looking for healthy activities for their children) – Tennis not only provides children with much-needed exercise, but also has been shown to help psychological skill development, improve bone growth and general fitness. (These benefits are very important to stemming the problem of childhood obesity). Physical activity also strengthens the immune system of every child who plays the game.

**PRE-TEENS AND TEENS** – People in this age group will have tons of fun, increase their social skills and build friendships. Tennis will help pre-teens and teens increase their self-confidence and generally feel better about themselves. Also, tennis can enhance their cognitive abilities, thus helping this group improve their grades.

**ADULTS** (Ages 18 – 55) – Tennis is a great fitness activity and good social outlet that provides general wellness by improving the immune system. It also boosts cognitive skills and emotional well-being.

**SENIORS** (Ages 55 – up) – Tennis is a tremendous activity for strengthening the immune system, thus improving longevity. It also assists in the development of a healthier bone structure and the prevention of osteoporosis. Basically, tennis will improve a person's overall fitness and general wellness.

**John Ratey, a Harvard psychiatrist and author of the book "SPARK" (2008), was quoted in USA Today (Feb. 19, 2008) as saying, "I recommend seniors work out five or six days a week. A heart-thumping game of tennis ... can keep the older brain in top shape."**

## Attacking the issue of obesity

This booklet explains that tennis can be a scientifically proven weapon in the fight against obesity. Everyone knows childhood obesity has reached epidemic proportions and that most school-age children don't get enough exercise in school-run physical education classes. Tennis lessons and activities offer great ways to help prevent and conquer obesity while at the same time teaching sportsmanship and teamwork. With obesity levels in adults and children rising, it only makes sense to give tennis a try.



If you don't believe what I've said to this point, here's my challenge: Test it! And, please test it in two ways. First, USPTA invites you to speak to five people who have played tennis regularly or have played the game a lot at some point in their lives. We will let this work stand the test of past players. We know that the majority of people will say that tennis was great and you will see that what is contained in this booklet is true. The second test is this. Play the game for yourself. If you have never played tennis, haven't played in a long time, or don't know where to start, go to [www.usptafindapro.com](http://www.usptafindapro.com) and let a USPTA-certified professional take you through a series of steps to make you the player you want to be. Let the USPTA be your vehicle to getting into (or back into) the incredible game of tennis.

## Importance of exercise

The benefits of regular exercise are well documented. What follows explains why tennis is a great exercise activity and offers substantiating evidence that tennis is one of the best choices for anyone who wants to be healthy and fit.

It's no wonder that people today find it difficult to stay on course when it comes to a healthy routine. There are many distractions that pull us off course. There's television, the Internet, video games, MP3 players, cell phones, and on and on. All these things accomplish one very important thing: **They keep us inactive as a society!**

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As a general rule, most people know they should exercise, but they complain about having to get to a gym for a good workout. USPTA asserts that tennis is a fun activity that engages its participants, is played indoors or out, is enjoyed with friends and family, and gives you a better workout than many other activities.

Not only does regular exercise provide you with general health benefits, such as improved cardiovascular and lung function, lower body fat, decreased risks of diabetes and cardiovascular disease, but it also gives you stronger bones supported by stronger and more flexible muscles. While the physical benefits of exercise are widely publicized, the mental and emotional benefits have not been adequately promoted, and yet they are just as important to a person's overall health.



Exercise has often been scientifically shown to relieve the symptoms of stress but it offers so much more. Recently, it was discovered that a fast-paced workout, like tennis, improves the production and release of brain-boosting proteins, and increases the production of cells in the brain's hippocampus, which is where learning and memory function takes place.

As cited in *USA Today* on Oct. 29, 2007, Catherine Davis, professor of pediatrics at the Medical College of Georgia, reported that "children who are not active may be at a disadvantage academically." Her research, funded by the National Institutes of Health, found that children who were involved in intermittent, high-energy running games for at least 40 minutes had significant improvement on an executive function test (examining skills for planning, organizing, goal achievement, resisting impulses, etc.)

over children who did no activity. The active group also exhibited an increase on a cognitive performance scale. Darla Castelli, professor of kinesiology and community health at the University of Illinois, says that this corroborates much of their research citing that they have "found strong associations between math performance and aerobic fitness among children."

As for adults, an eight-year study found a "relationship between physical inactivity and cognitive decline" across all subgroups <sup>(1)</sup>. The sedentary lives of corporate workers result in insufficient physical stress and that energy imbalance negatively impacts cognitive performance. The results also found "a 'dose' relationship between exercise and mental acuity – a little exercise is good, but more is better" so long as adequate recovery is provided and overtraining does not occur.

# Tennis is the ultimate exercise – both mentally and physically

Tennis-specific research has discovered:

- People who participate in tennis three hours per week at a moderately vigorous intensity cut in half their risk of death from any cause, according to the late Dr. Ralph Paffenbarger, who was an internationally recognized exercise authority and studied more than 10,000 people for 20 years <sup>(2)</sup>.
- Tennis players scored higher in vigor, optimism and self-esteem while scoring lower in depression, anger, confusion, anxiety and tension than other athletes and nonathletes, according to Dr. Joan Finn and colleagues at Southern Connecticut State University <sup>(3)</sup>.
- Since tennis requires alertness and tactical thinking, it may generate new connections between nerves in the brain and promote a lifetime of continuing brain development <sup>(4,5)</sup>.
- Tennis, as a racquet sport, outperforms golf and most other sports in developing positive personality characteristics <sup>(6)</sup>, according to Dr. Jim Gavin, author of "The Exercise Habit."
- Competitive tennis burns more calories than most other activities, according to studies in caloric expenditures. A detailed analysis in the January 2005 issue of *Consumer Reports* compared various activities and the calories burned. The article showed that tennis ranks among the top five activities that one could participate in to burn the most calories and, in fact, burns more calories than swimming, rowing, weightlifting, jazzercise, hiking or golf. <sup>(7)</sup>

## Tennis outperforms many other sports in development of personality characteristics

	Tennis	Golf	Running	Weight-lifting	Inline Skating	Downhill Skiing
Sociability	Very High	Very High	Moderate	Moderate	Moderate	High
Spontaneity	Very High	Moderate	Low	Very Low	Moderate	Very High
Competitiveness	Very High	Very High	High	Moderate	Low	Moderate
Risk-seeking	High	Moderate	Low	Low	Moderate	Very High
Focused	Very High	Moderately High	Very Low	Low	Moderate	High
Aggressiveness	Very High	Low	Moderate	Very High	Low	Moderate

Adapted from Gavin, 2004 <sup>(6)</sup>

With these facts in mind, review the 34 specific reasons why you should consider playing regularly!

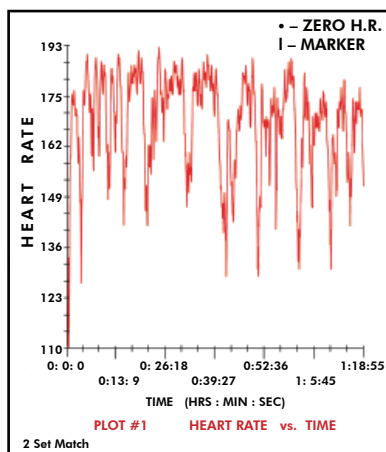
Be sure to contact your USPTA Professional for lessons and lots of other fun tennis activities. If you don't already have a certified tennis teacher, visit [www.usptafindapro.com](http://www.usptafindapro.com) to find one near you.

## Physical reasons to play tennis

### 1. Aerobic fitness

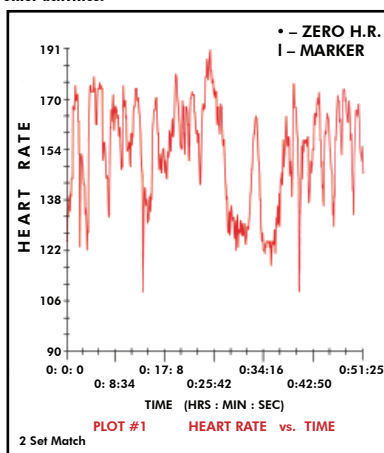
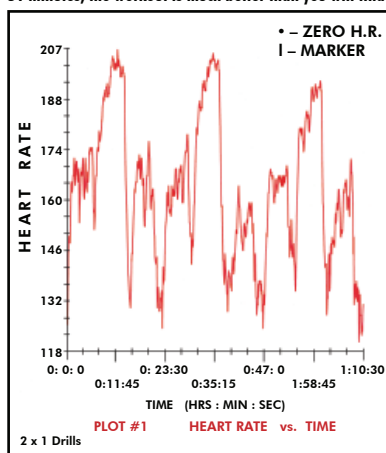
Playing tennis burns fat, improves cardiovascular fitness and helps the body maintain higher energy levels.

The American College of Sports Medicine has cited that more calories may be burned in high-intensity intervals of exercise interspersed with low to moderate intensity levels. That's exactly what tennis provides. It is interval training, due to the nature of how points are played. Because the heart rate gets into a fat-burning zone and then can easily go higher, tennis has been recognized as one of the leading activities that help to burn fat. Also, because the intensity of tennis can get fairly high, depending on how hard a player works while playing, and because tennis is purely an interval sport, more fat is burned after working out than during the time on court. Thus, physical capacity gets stronger and players have more energy later on for what matters most in life.



Left: Note the natural intervals that occurred in this match that took place over 1 hour, 19 minutes. It's obviously a great workout.

Below: If you compare the intensity of a workout between three players hitting two-on-one (bottom left), you can tell when this player is by herself hitting against the two other players. In another two-set match (bottom, right) over just 51 minutes, the workout is much better than you will find in other activities.



As a testimony to this, Bloomfield and colleagues <sup>(8)</sup> determined that 7- to 12-year-old tennis players had superior cardiovascular endurance compared to casual sport participants. It has also been determined that singles tennis meets the intensity criteria established by the American College of Sports Medicine for developing and maintaining cardiorespiratory fitness. In another study of 141 tennis players, ages 30 to 74, Galanis, et al, <sup>(9)</sup> observed that even moderate physical activity improved overall lung function.

It's well accepted that the maximum amount of oxygen people can take in diminishes as they age, which means heart-lung capacity also declines. However, Therminarius, et al, <sup>(10)</sup> found that playing tennis regularly seems to decrease the rate of this age-related decline. Senior players can also realize another benefit from tennis. When studying senior tennis players (55 and older), Howley, and other scientists <sup>(11)</sup> observed the older players to have higher HDL (good cholesterol) and a higher HDL to total cholesterol ratio than a control group.

In reviewing 17 different studies, Pluim and her associates <sup>(12)</sup> found that singles play allowed a player to be in the 70 percent to 90 percent range of maximum heart rate, which makes tennis an outstanding activity for improving cardiorespiratory function.

## **2. Anaerobic fitness**

Playing tennis builds muscle power, and improves physical capacity.

Since the average point in tennis is between 4 and 12 seconds long, tennis allows players to fully engage their anaerobic (or power) system. During the short duration of a tennis point, the body relies on the energy provided by a starch called glycogen that is stored in the muscles. This form of metabolism works without the aid of oxygen and a player goes into what scientists call oxygen debt. Following this, the body recovers to replenish this "debt" through improved heart and lung function. The natural repetition provided by tennis allows the body to adapt by building muscle and improving heart-lung function. In fact, Legros and colleagues <sup>(13)</sup> found that the rate of phospho-creatine concentrations (PC) (a measure of anaerobic capacity/fitness) recovery was much faster in tennis players or active people than in sedentary subjects.

***"Tennis is a game that, if you start playing early and continue to play it, can actually reduce your risk of heart attacks because of the cardiovascular workout it provides."***

***—Dr. Scott Bautch of the American Chiropractic Association's Occupational Health Council.***

## **3. Improved acceleration**

Tennis improves a person's ability to accelerate.

One of the key measures to athletic success is the ability to accelerate from a still position to maximum velocity. Regardless of the sport activity, accelerating and positioning are foundational to high achievement. This occurs naturally in tennis! In every point while playing tennis, you must explode, sprint, and recover for the next shot. This constant and repetitive "explosive movement" trains your body for forceful movements that truly expand your capacity. As the muscles adapt to the need for improved strength and power, you become quicker and more agile.



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**"The combination of both high and low exertion levels that tennis offers can provide a unique exercise experience, as well as tremendous health benefits," says Dr. Scott Baultch of the Occupational Health Council of the American Chiropractic Association. "In addition to helping to reduce your risk of heart attacks, playing tennis can also tone the muscles of your upper and lower body, burn calories, and improve your balance, hand-eye coordination and agility."**

#### **4. Enhanced power for first step**

In tennis, what matters is the first step, which requires anticipation, quick reaction time and explosive action.

Power is work divided by time or, equally, power is force multiplied by the distance moved and then divided by time. Because of the natural demands of tennis, improved power is a basic end result.

Every move you make toward the next shot is a very short distance (approximately 4 meters), so what kind of speed is required to play tennis? It is definitely not the speed required for a 100-meter dash. But, it does require a powerful first step, which enhances quickness in all activities. Because tennis players continually practice "ready, read, react, and explode" for each point, a powerful first step becomes a natural end product. That's why tennis is viewed as one of the best cross-training activities for athletes in any sport. Athletes in a number of sports (including basketball, football, baseball, soccer, volleyball to name a few) use tennis as their off-season training regimen to improve their fundamental skills.

#### **5. Improved speed**

Speed is the distance you travel divided by time.

Tennis is a sport that, through its very design, improves people's speed. During a point, players must respond to an opponent's shot, move forward and backward the length of a 39-foot court (the distance from the baseline to the net) and side to side along the width of 27 feet (the distance from sideline to sideline), and sometime even farther if they move diagonally. Based on the time per point and the distance a player must move during that time, tennis is one of the world's best activities for developing all-out speed.

#### **6. Leg strength**

You can build leg muscles through the hundreds of starts and stops that tennis requires.

The constant lunging, pushing off or leaping to hit an overhead develops your legs unlike many other activities. Laforest, S., and other researchers <sup>(14)</sup>, even found that the muscles of tennis players demonstrated a greater resistance to fatigue than those of sedentary people across two sets of age groups (ages 27 to 30 and ages 64 to 66). In fact, people often say that tennis players have "great legs." Why? Because of the natural repetitions that occur when they play.

#### **7. Coordination**

Tennis develops incredible coordination.



Tennis requires that you move your entire body to get in position, ensure that you are the right distance from where the ball is going to be, read the opponent's shot, prepare your own body for the return, execute your return and then get back in position for the opponent's next shot.

In one investigation, timing was studied regarding how well a person tracks an object and positions himself relative to the arrival of the object. In a study examining tennis players and novices at ages 7, 10, 13, and 23, it was found that tennis practice accelerates the development of timing accuracy. <sup>(15)</sup>

In a study specifically using tennis to examine aging and coordination, Lobjois, et al, <sup>(16)</sup> did the following: Tennis players and nontennis players of various ages were studied: Ages 20 to 30, 60 to 70, and 70 to 80. A timing task had an object accelerating, at constant velocity or decelerating, and the subjects were asked to time their response to the object's movement. Even though all participants were affected by the velocity manipulation, this response bias was increasingly pronounced with advancing age in nonplayers and no difference was found among player groups of different ages.

***"When I was 40, my doctor advised me that a man in his 40s shouldn't play tennis. I heeded his advice carefully and could hardly wait until I reached 50 to start again."***

**—Hugo L. Black**

## **8. Enhanced gross motor control**

You must move and perform ball-striking skills in tennis that require control of your large muscle groups.

The large muscle groups of your body get a great workout, not only from the force production but also from the coordination required to get into position. Andersson, et al, <sup>(17)</sup> observed tennis players to reach higher flexion torques (rotational force production) than other athletes and nonathletes. Tennis players also demonstrated more strength in lateral movements.



## **9. Better fine motor control**

In the great game of tennis, you often must slow the ball down and hit a gentle, soft return. We call these maneuvers either a drop shot or drop volley.

To hit successful touch shots, you must develop fine motor control of your arm(s) and hand(s) to decelerate the racquet and hit a highly controlled shot that will barely clear the net with a very low bounce. In a study to examine the ability to be rhythmically accurate and to maintain a steady rhythm in movement execution (considered to be one of the best basic abilities of an athlete), Zachopoulou and research associates <sup>(18)</sup> found that a tennis group (compared to basketball, swimming, and a control group) was the most rhythmically accurate.

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## 10. Agility

Tennis improves agility because it forces you to change direction as many as five times in 10 seconds during a typical point.

When playing a point, you must constantly change direction. Imagine if you do this over and over for the duration of an entire match or tennis workout, which could be well over an hour. The overall agility gained from playing tennis is great for your body. Also, coaches in other sports are always looking for ways to vary their practices and workouts. Cross-training has become a huge part of what athletes do, both for the improvement and/or maintenance of all forms of fitness as well as the improvement of general skills that will benefit them in their specific activity. Tennis provides great cross-training for other sports that require rapid changes in direction, including football, basketball, soccer, baseball and volleyball.

## 11. Good dynamic balance

Dynamic balance – balance while moving – is as important in everyday life as it is in sports.

Tennis requires you to maintain total control of your body, even while running at top speed. This skill easily translates to life in general. Without balance, you will more easily fall when climbing a ladder, hiking up inclines, or you could even lose your balance while performing simple tasks. Tennis provides great dynamic balance training because you must move to play and develop total body control to prepare for shot execution. Children benefit from learning tennis because it makes them more agile as they develop. Dynamic balance training is beneficial for older adults because it allows them to function at very high levels in normal life, even into their 90s.

## 12. Cross-training

Tennis is a physically demanding sport that's fun and challenging for athletes of other sports.

The eyes of the sporting world were opened to the cross-training benefits of tennis when it was revealed in popular literature during the mid-1980s that many world-class alpine skiers played tennis in the off-season. Why, you ask? Because tennis provides athletes of other sports with all the benefits they want and need. In a 1999 study, Japanese junior tennis players were compared with "ordinary" children and it was determined that the tennis players were superior in aerobic capacity, agility and muscle power. (Katsuta, S., et al <sup>(19)</sup>). If you have a passion for another sport or activity, you might also consider playing tennis as a cross-training activity. It will provide you with benefits that you never imagined.

## 13. Bone strength

For years, scientists and physicians have recommended "impact" exercises for people who want to increase bone strength and density, and prevent osteoporosis.

Experts usually recommend running, jogging or even walking to build bones, but when it comes to an activity that will create impact with the ground, as well as im-

pact when striking the ball, nothing beats tennis. Bone development for children is critical, and bone growth and maintenance for seniors is equally important.

Using tennis players as the experimental group and comparing them to sedentary people of the same age, Pirnay and colleagues <sup>(20)</sup> clearly demonstrated that there was a positive correlation between the tennis players and bone mineralization. In another classic study on this topic, the bone mineral content of athletes (tennis players were studied) was significantly greater than that of nonathletes but did not differ among the sports. Therefore, tennis contributes to bone mineral density. <sup>(21)</sup>



Pluim and her associates <sup>(12)</sup> identified 22 independent studies examining the effects of tennis play on bone health. Greater bone mineral content and density was improved in the hip and lumbar spine regions of tennis players than in control groups. These researchers also agreed that tennis, three times per week, supports the exercise recommendations of the American College of Sports Medicine regarding physical activity and bone health, both for the development of bone mineral in children and adolescents, as well as the preservation of bone health during adulthood.

#### **14. Improved immune system**

Tennis, through its conditioning effects, promotes overall health, fitness and resistance to disease.

Studies have demonstrated that the more active you are the stronger and healthier your immune system will be. And, the intensity of exercise helps to strengthen the immune system even more. It makes sense, then, that tennis, with its inherent demands for heart rate, interval training, impact, agility, etc., is one of the most beneficial activities in which you could participate. Schneider and Greenburg <sup>(22)</sup> cited tennis specifically as an activity in which participants were less likely to be obese, smoke, or be involved in other forms of threatening activities than those who participate in team sports and an aggregate of other sports. And, LaForest, with other scientists <sup>(14)</sup>, discovered that recreational tennis players who participate twice a week had a lower body fat percentage than age-matched control groups.

Finally, and adding to the Paffenbarger study cited earlier <sup>(2)</sup>, Houston and colleagues <sup>(23)</sup> published a longitudinal investigation of more than 1,000 male students examined after an average of 22 and 40 years. Sustained playing of activities such as tennis was associated with a lower risk of cardiovascular disease. They inferred that a primary factor for this beneficial health profile may be that tennis was the sport played most often through mid-life.

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## 15. Better nutritional habits

Tennis players learn how to eat to enhance energy production during a match and recovery after a match.

Although recreational players may be able to get away with poor nutrition in the short term and not have it adversely affect their tennis, this won't be the case for people who play on a regular basis or compete at high levels of the game. If you play a lot of tennis – or any sport – you'll learn that you must fuel your body with the proper foods to perform well. And, just as important, you will learn from your USPTA Professional how to use proper nutrition to recover after tennis workouts or a long match. The information learned from this will help you in life as you endure the normal stresses encountered.



## 16. Good hand-eye coordination

Tennis players develop good hand-eye coordination because they must constantly judge the timing between the oncoming ball and the proper contact point.

Not only must you position your body correctly to prepare for the shot, you also must coordinate the swing of your body and arm(s) to get the racquet in the right place at the right time and swing with the correct speed and the correct racquet-face angle. If any of these are “off,” your shot will suffer. In a study comparing 53 university athletes (including tennis players) and 46 nonathlete university students, Ishigaki and Miyao <sup>(24)</sup> determined that dynamic visual acuity of the athletes was superior to that of the nonathletes. And, in an article reported in the May 23, 2007, *Wall Street Journal*, Damian Farrow, a scientist at the Australian Institute for Sport, found that tennis players unconsciously read their opponent's body language a third of a second before the ball is hit to predict where a serve is headed. It is this type of visual acuity development that helps people in all walks of life.



## 17. Flexibility

Because tennis players continually stretch and maneuver to return the ball to their opponent they become more flexible.

In tennis you will often find yourself getting in position and “reaching” to return the opponent's shot. In one investigation, flexibility was seen to improve in children of average age 11.4 years, during a 12-week session of playing sports such as tennis. The average gain was 3.76 cm <sup>(25)</sup>.

## Psychological reasons to play tennis

### 18. Strong work ethic

Tennis improvement through lessons and practice reinforces the value of hard work.

Studies have demonstrated that people who play tennis develop a perception of control in what they do. In one study of football players, tennis players and non-athletes, the tennis players and football players had a greater perception of control than the nonathletes. Additionally, tennis players were found to be highest in personal efficacy, meaning that they felt they could achieve the desired results more effectively. <sup>(26)</sup>

To become proficient in tennis over time requires work on the court. Your local USPTA-certified professional can show you how to practice to get the most out of your game and how to truly enjoy the benefits tennis has to offer. The work ethic gained from practicing to get better will transfer over to your daily life before you know it.

***"I'll let the racket do the talking."***

**—John McEnroe**

***"Whoever said, 'It's not whether you win or lose that counts,' probably lost."***

**—Martina Navratilova**

### 19. Self-discipline

Tennis requires you to work on improving your skills during practice and to control the pace of play during competition, which builds discipline.

Although research has shown that self-discipline in human beings is limited and that we are really creatures of habit, tennis can certainly help improve the habits surrounding your self-discipline. In tennis singles, you are by yourself on the court, making decisions on your own, planning strategies on your own, and truly developing your innate skills of self-discipline. In 1996, Yoo examined self-confidence and competition anxiety among various sport activities. Tennis was among the sports examined to study several psychological factors. Yoo found that the higher the sport orientation, the less competition anxiety and the more self-confidence. <sup>(27)</sup>

In another investigation of wheelchair tennis participants, Greenwood and colleagues <sup>(28)</sup> compared wheelchair tennis players to wheelchair nontennis participants. It was determined that wheelchair mobile people participating in tennis seem to be more confident about general wheelchair mobility tasks than are wheelchair mobile nonparticipants.

***"Proper physical education is an important part of healthy development for all children," said Tom Early, CEO for Health Plus. "The game of tennis is not only a way to promote strong physical health, but also a great way to learn concentration and discipline. These are all benefits that the children involved will take with them into their adult lives."***

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## 20. Recognize and manage mistakes

A tennis match can become a game of emergencies! More matches are won by players capitalizing on their opponents' unforced errors than by the players hitting outright winners.

It provides the opportunity for you to learn how to create a bigger emergency for your opponent than your opponent creates for you. You constantly deal with crises, one after another. Many people credit the game of tennis for giving them the skills to adapt to mistake management and then translate the same skills to their everyday life. This allows them to work through their mistakes more effectively and with less stress.

**Tennis was never work for me, tennis was fun. And the tougher the battle and the longer the match, the more fun I had.**

**—Jimmy Connors**

## 21. One-on-one competition

The ability to do battle on court trains you in the ups and downs of a competitive world. During the 2008 match between Andy Roddick and Roger Federer at the Sony Ericsson Tournament (where Roddick overcame a 11-match losing streak with Federer), Roddick won a big point at a particularly stressful time in the match. The commentators said, "Fortune goes to the brave!"

You must react and respond to what your opponent has done with the ball, how he or she wants to play the point, think while you are moving, plan while you are hurrying to the shot, execute your shot, and recover to your next position, while the whole time determining how you can take control of the point. The question you must learn to quickly answer: Do you need to be defensive and patient or do you take the offensive and set up to finish the point? All of this is learned in the great game of tennis.

**"I have always considered tennis as a combat in an arena between two gladiators who have their racquets and their courage as their weapons."**

**—Yannick Noah**

## 22. Build responsibility

Tennis requires you to practice and "show up" for competition on time and with all of your equipment.

In a study examining performance attributions and how self-centered an individual was, Van Raalte <sup>(29)</sup> observed that people tend to take credit for success and to blame external factors for failure. This investigation observed that in a laboratory setting, these self-serving biases were observed. However, when observing tennis players and their performances, self-serving attributions were not found.

Tennis players are only as good as how they show up on the court. Ensuring that their equipment is in good condition (grips, strings, etc.), having water or energy drinks in preparation for that long match, and even knowing that they are 100

percent responsible for their own line calls improves one's capacity to prepare for life in general.

**"Champions take responsibility. When the ball is coming over the net, you can be sure I want the ball."**

**—Billie Jean King**

### **23. Manage adversity**

Tennis players must learn to adjust to changing conditions and still be able to compete tenaciously.

For example, on one side of the court, you can't swing too hard because the wind might be at your back, then you change ends and now you have to adjust your game because you must swing with three times the effort as you hit into the wind. Likewise, the sun may be in your eyes, which exacerbates the demand on your game. Although these things might be viewed as overly simplistic, they still add



to the elements to which you must respond in the midst of competition. It is this very fact that makes tennis one of the world's greatest games; you never know what is coming your way in the form of elements, opponents, line calls, and on and on.

There is one additional thing you should consider if you want to learn how to play tennis or get reconnected to the game, and this is where a USPTA-certified professional can help. In his doctoral dissertation research, Ryska <sup>(30)</sup> found that highly supported tennis players reported lower anxiety than lower support athletes. And, as he predicted, a significant coach support state was seen in people with high anxiety traits. Tennis coaching can and will help you with all of life's battles.

**"Tennis is a perfect combination of violent action taking place in an atmosphere of total tranquility."**

**—Billie Jean King**

### **24. Manage stress**

The physical, mental and emotional stress of tennis forces you to increase your capacity for dealing with stress.

When you play singles, you are out there on your own. Not only are you alone on the court during a singles match, but you must continually battle your opponent. And, then there's the battle with yourself.

Stress is actually the stimulus for growth, and recovery is when you grow. With no recovery, there is no growth. The key to successful living is to build recovery



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naturally into your life so that you can increase your capacity for stressful situations <sup>(31)</sup>. When a person lives a linear lifestyle by just go, go, go, that life is dysfunctional! And, complete linearity in life can cause high blood pressure, the development of poor lifestyle habits and even death. However, tennis helps you to build recovery in a natural way by the very essence of how it is played. You literally



get to practice thinking and acting under stress, which is huge preparation for life skills. It is a continual battle with your opponent, but also with yourself. Every point has the capacity to become an emotional slap in the face. Yet, the more you play, the more effectively you learn to manage all of the stresses that life and tennis competition create.

***"The only way to quieten me is to invite me to a tennis match."***

***—John Forsythe***

***"It's one on one out there, man. There ain't no hiding. I can't pass the ball."***

***—Pete Sampras***

## **25. Recover and adapt**

Because of the nature of tennis, a player must learn to recover quickly, adapting to the stress that each point presents.

Fitness, both physical and mental, has always been measured by how quickly you recover from a bout of stress. Everything about the human system oscillates. Brain activity, heart rhythms and sleep cycles are just a few of the body's systems that constantly go up and down. By the very nature of how it's played, tennis virtually duplicates this natural oscillation. Stress, or heart rate, goes up during a point, and then you recover for very short periods of time in between points. Wouldn't it be great if you could learn to recover from any bout of stress in life within only a few seconds? Tennis can be your instructor! Loehr has demonstrated how to use the between-point time in tennis to recover from the stress of the previous point and then prepare for the upcoming point <sup>(32)</sup>.

In life you must learn how to recover quickly because life often doesn't afford much 'down time,' especially in the busy lives we lead. In tennis, your USPTA-certified professional will teach you how to use the time between points and the time on change-overs to recover <sup>(32)</sup>. Your professional tennis coach will teach you muscle relaxation, breath control, focus, rehydration and improved concentration, while also coaching you on projecting high intensity and confidence. You will be taught how to never show weakness on the outside, by not allowing negative emotions to intrude into your recovery time. You actually learn how to use the short recovery time to recapture energy from the previous point, which gives you energy for the next point.

## 26. Planning and implementation

In tennis, you naturally learn how to plan and implement a strategy based on your anticipation of your opponent's moves.

In between every point, players have the opportunity to plan what they intend to do next. This natural course of events is another way in which tennis complements everyday life. You execute during a point, then you recover from that stress, and then immediately plan what you want to do before the next point begins. Likewise you get to plan your strategy of attack for the next match you play.

In an article titled, "Coordination determines brain power," this question was asked: "How good are you at playing tennis? The reason: Because good coordination appears to be an important marker of how intelligent we are." <sup>(33)</sup>

## 27. Develop problem-solving skills

Tennis forces you to learn to solve problems based on angles, geometry and physics.

Every time you play tennis, your opponent wants to put you in a situation where he or she can win the point. You naturally learn to think quickly, analyze what is happening, create the tactic to respond and then attempt to turn the tables on your opponent. The court literally becomes a chess board, except you physically must execute to develop the angle or positioning of your next shot to put the opponent off.

**"It's difficult for most people to imagine the creative process in tennis. Seemingly, it's just an athletic matter of hitting the ball consistently well within the boundaries of the court. That analysis is just as specious as thinking that the difficulty in portraying King Lear on stage is learning all the lines."**

**—Virginia Wade**

In a study examining adolescent tennis players and a group of adolescents who did not participate in sports, Daino <sup>(34)</sup> found that tennis players scored higher in extraversion and a will to win, while exhibiting less neuroticism, anxiety, apprehension, obsession and depression than nonsport participants.

## 28. Develop performance rituals

Tennis is a game of rhythm and preparation. In between points you will learn how to prepare yourself physically, emotionally, and mentally for the next point.

If you execute performance rituals before each serve or return, you'll learn to control your rhythm and deal with pressure. These same skills can transfer to taking exams, conducting a meeting or making an important presentation.

Loehr in the mid-1980s, demonstrated how tennis players use pre-performance rituals as they prepare to serve or return serve. He taught that after every point, great tennis players have developed the skills for four very specific actions <sup>(35)</sup>. There is a positive physical response after the point, a relaxation phase, mental preparation and then rituals. When serving, for example, a person decides where to serve the ball, how hard and with what kind of spin. This mental preparation ritual plays

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a huge role in many other sport activities and in life. Research at the Human Performance Institute has shown that “great leaders know how to manage their energy.” Where else could you find a more perfect training ground than on a tennis court, where you are literally placed in a situation and must learn to prepare for what is about to happen?

**“There’s a lot of ingredients that go into being a good tennis player.”**

**—Rod Laver**

## **29. Sportsmanship**

Tennis teaches all of us about fairness, honesty, integrity, and overall sportsmanship.

As you play, you are responsible for calling your own lines. It is up to you to be fair and honest when the opponent’s shot falls into your court near one of the court boundaries, and to call whether the shot was good or out.



Great tennis players have learned to fight a one-on-one battle on the court, but they’re also incredibly sportsmanlike when their opponent hits a great shot. All of the great players have been seen clapping their racquet face at a great shot or they have been heard saying, “Great shot” or “Well done.” The behavior is at the core of tennis and is stressed by USPTA Professionals.

**“Tennis has given me soul.”**

**—Martina Navratilova**

## **30. Win with grace and lose with honor**

Gloating after a win or making excuses after a loss doesn’t work in tennis or in life.

Individual sports teach that you are on your own, win or lose. After a tennis match, part of the code of conduct is that you shake hands with your opponent. Then, as your USPTA Professional will show you, it is time to evaluate how you did, where you executed well and where you didn’t.

Watch the great players on television after a match and in the post-match interview. They are in control, not bragging and not putting anyone down. In fact, they are usually lifting up their opponents by congratulating them on a great match.

**“If you can react the same way to winning and losing, that’s a big accomplishment. That quality is important because it stays with you the rest of your life, and there’s going to be a life after tennis that’s a lot longer than your tennis life.”**

**—Chris Evert**

### 31. Teamwork

Successful doubles play depends on you and your partner's ability to communicate well and play as a cohesive unit.

Tennis doubles requires you to move with your partner, and know where he or she is at all times. You must communicate or know each other extremely well to be clear on who is taking the oncoming shot. You must cover for your partner if he or she cannot get to a ball (such as a lob over his or her head).

The next time you watch a doubles match, the Davis Cup or Fed Cup perhaps, notice how the players move together, talk between points, connect while sitting on the changeover, and work as a complete unit. They will use signals to let one another know when he or she is going to move across the net and they will communicate clearly when a ball goes over one's head on who is going to take the ball and whether to switch sides of the court. This type of collaboration transfers well to the teamwork required in various settings of life.

### 32. Develop social skills

Tennis encourages participants to be social, especially recreational players. There are many opportunities for players to interact and communicate during a match – before play begins, during changeovers and after a match.

In a study on achievement and self-esteem of female athletes in which tennis was one of the sports examined, Brown determined that participating in a sport like tennis is an avenue in which females can experience achievement and enhanced self-esteem <sup>(36)</sup>. Whether you play at a club, or the public parks, tennis players always gather before and after matches. The gatherings that can be seen after league matches develop incredible camaraderie. The connections made through tennis play can and often do last a lifetime.

***"Tennis lets you talk while you're playing."***

***—Jane Kaczmarek***

### 33. Fun

People who play tennis experience healthy feelings of enjoyment, competitiveness and physical challenge.

The most successful tennis players have tremendous fun while still fighting hard to compete. This is not necessarily fun in the form of always laughing (although you certainly can develop an innate sense of self-humor from tennis), but it is more the feeling of internal contentment because you just love hitting the ball or you love the feeling of competition.

***"I love the feel of hitting the ball hard, the pleasure of a rally. It is these things that make tennis the delightful game that it is."***

***—Helen Wills Moody***

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## **And, reason No. 34 – Tennis is the sport for a lifetime**

When all is said and done, it's hard to argue against these reasons for playing tennis!

Tennis, as sports science supports, is a great choice for many reasons. Not only does it contribute to physical fitness and health, it also enhances mental focus, self-esteem and a host of other personality traits that positively affect a person's overall sense of well-being.

At the end of the day, we again invite you to speak with anyone who has played a lot of tennis in their life. We know from all our experience that these people will say one or more of several things:

***"I met some of my best friends on a tennis court."***

***"Tennis is the greatest game in the world because it keeps me physically fit."***

***"Tennis helped me to be more competitive in my business life, understanding more fully how to compete."***

***"I learned how to work with people by playing tennis doubles."***

***"I learned to control my anger through tennis. Managing mistakes was key to this."***



To get started playing tennis, or to return to the game if you played previously, contact your local USPTA Professional. Visit [www.usptafindapro.com](http://www.usptafindapro.com) and search for a certified professional using your city, state, ZIP code or a pro's last name.

## For the USPTA Professional

The great thing about tennis is that it can be tailored to meet anyone's fitness needs, from those of the very youngest players to the oldest and for everyone in between. Don't forget the junior programs, adult clinics and league opportunities and a mix of all of these for every age, gender and playing level at your facility. Anyone who wants to improve his or her health through tennis can do it with the programs you provide to your clients on a daily basis. It's up to you to promote tennis as a means of getting fit and staying healthy.

Not only is USPTA the largest delivery force for tennis, it also provides programs – developed especially for you – that create the perfect opportunities to highlight our sport, your teaching skills and the game's benefits. Also, the tennis industry encourages professional tennis coaches and teachers to use additional tools to keep people playing tennis. Just a few programming ideas include:

- Little Tennis<sup>®</sup>
- Adult Tennis League<sup>SM</sup>
- Lessons for Life<sup>TM</sup>
- QuickStart Tennis Play Format (to be used in conjunction with Little Tennis)
- Junior Circuit<sup>TM</sup>
- USPTA Member-Beginner Guest events
- Cardio Tennis

Each of the programs above can be modified to meet specific needs of the participants.

For details on USPTA program ideas, log into the members-only area of the USPTA Web site and click on the tab for "Programs."

Good luck. As USPTA members, you've got the world's best game to teach, the resources to promote *Tennis – for the health of it!* and some wonderful programs through which to deliver the sport and the message.

*Many references were used in the development of this booklet. The best scientific summary of everything discussed within this document may be found in Health Benefits of Tennis, by Pluim, B., Staal, J.B., Marks, B., Miller, S., and Miley, D., and in British Journal of Sports Medicine, 41: 760-768, 2007.*



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## References

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1. Yaffe, K., 2001, May 9, "Exercise protects against cognitive decline." Presented at the Annual Meeting of the American Academy of Neurology. Reported at [http://findarticles.com/p/articles/mi\\_m0CYD/is\\_16\\_36/ai\\_78050837](http://findarticles.com/p/articles/mi_m0CYD/is_16_36/ai_78050837).
  2. Paffenbarger, R.S. Jr.; Hyde, R.T.; Wing, A.L.; Lee, I.M.; Jung, D.L.; Kampert, J.B. "The association of changes in physical-activity level and other lifestyle characteristics with mortality among men." *New England Journal of Medicine*, 1993, 328 (8), Pages 538-545.
  3. Finn, J.A., et al., "Characteristics for predicting success among highly skilled youth tennis players." USTA Research Grant, 1990. Information available from Dr. J.A. Finn, Southern Connecticut State University., New Haven, Conn. 06515.
  4. Wetzel, K. and Harmeyer, K. "Mind games: The aging brain and how to keep it healthy." Albany, N.Y., Detmeyer/Thomson Learning, 2000.
  5. Snider, M. "Tennis and the brain." *Tennis USTA*, October, 1996, Pages 9-11.
  6. Gavin, J. "Pairing personality with activity: New tools for inspiring active lifestyles." *Physician and Sports Medicine*, 2004, 32 (12).
  7. *Consumer Reports*, January 2005. "What workouts do for you!" Retrieved March 28, 2008 at <http://www.e-rights.prod.consumerreports.org/cro/health-fitness/exercise-wellness/working-out-what-workouts-do-for-you-705/index.htm>.
  8. Bloomfield J.; Blanksby, B.A.; Beard, D.F.; Ackland; T.R.; Elliott; B.C., "Biological characteristics of young swimmers, tennis players and noncompetitors." *British Journal of Sports Medicine*, 1984, 18 (2), Pages 97-103.
  9. Galanis, N; Farmakiotis, D; Kouraki, K; Fachadidou; A., "Forced expiratory volume in one second and peak expiratory flow rate values in nonprofessional male tennis players." *The Journal of Sports Medicine*, 2006, 46 (1), Pages 128-31.
  10. Therminarius, A., Dansou, P., Chirpaz-Oddou, M. "Hormonal and metabolic changes during a strenuous tennis match: Effect of aging." *International Journal of Sports Medicine*, 1991, 12:10.
  11. "HDL cholesterol in senior tennis players." Howley, E.T.; Gayle, R.C.; Montoye, H.J.; Painter, P.; Fleshood, L., *Scandinavian Journal of Sports Sciences*, 1982, 4 (2), Pages 44-48.
  12. Pluim, B.; Staaf, J.B.; Marks, B.; Miller, S.; Miley, D., "Health Benefits of Tennis." *British Journal of Sports Medicine*, 2007, 41: Pages 760-768.
  13. "Effets de l'entraînement sur le métabolisme musculaire local évalué, in vivo, par spectrométrie RMN du phosphore." "Effects of training on local muscle metabolism measured with in vivo <sup>31</sup>P NMR spectrometry." Legros, P.; Kozak-Reiss, G.; Gascard, J.P.; Syrota, A.; Durand, J.. *Science et Motricité*, November 1988: Issue 6. Pages 24-30
  14. Laforest, S.; St-Pierre, D., "Effects of age and regular exercise on muscle strength and endurance." *European Journal of Applied Physiology*, 1990, 60, Pages 104-111.
  15. Benguigui, N; Ripoll, H., "Effects of tennis practice on the coincidence timing accuracy of adults and children." *Research Quarterly for Exercise and Sport*, 1998, 69 (3), Pages 217-223.
  16. Lobjois R, Benguigui N, Bertsch J, "Aging and tennis playing in a coincidence-timing task with an accelerating object: the role of visuomotor delay." *Research Quarterly for Exercise and Sport*, 2005, 76 (4), Pages 398-406.
  17. Andersson, E., Sward, L., Thorstensson, A. "Trunk muscle strength in athletes." *Medicine and Science in Sports and Exercise*, 1988, 20 (6), Pages 587-93.
  18. Zachopoulou, E.; Mantis, K.; Serbezis, V.; Teodosiou, A.; Papadimitriou, K., "Differentiation of parameters for rhythmic ability among young tennis players, basketball players and swimmers." *European Journal of Physical Education*, 2000, 5 (2), Pages 220-230.
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19. Katsuta, S.; Omori, H.; Noda, T.; Hagiwara, N.; Takamatsu, K.; Takai, S., "The change of physical characteristics with growth in Japanese top junior tennis players." *Bulletin of Institute of Health & Sport Sciences*, University of Tsukuba, 1999, Vol. 22 Pages 43-53.
  20. Pirnay, F.; Bodeux, M.; Crielaard, J.M.; Franchimont, P. "Bone mineral content and physical activity." *International Journal of Sports Medicine*, 1987, 8 (5), Pages 331-335.
  21. Nichols DL, Sanborn CF, Bonnick SL, Gench B, DiMarco, N. "Relationship of regional body composition to bone mineral density in college females." *Medicine and Science in Sports and Exercise*, 1995, 27 (2), Pages 178-182.
  22. Schneider, D.; Greenberg, M.R.. "Choice of exercise: a predictor of behavioral risks?" *Research Quarterly for Exercise & Sport*, 1992, 63 (3), Pages 231-237.
  23. Houston, T.K., Meoni, L.A., Ford, D.E., Brancati, F.L., Cooper, L.A., Levine, D.M., Liang, K.Y., Klag, M.J. "Sports ability in young men and the incidence of cardiovascular disease." *The American Journal of Medicine*, 2002, 112 (9), Pages 689-695.
  24. Ishigaki H, Miyao M. "Differences in dynamic visual acuity between athletes and nonathletes." *Perceptual and Motor Skills*, 1993, 77, Pages 835-839.
  25. Naughton, G.; Carlson, J. Sports participation: a physiological profile of children in four sports over a 12-week season., *Pediatric Exercise Science*. (1991): 3 (1). 49-63.
  26. Paulhaus, D. (1988). "The balanced inventory of desirable responding." Buffalo, Toronto: Health Systems.
  27. Yoo, S. "A model to understand sport-confidence and sport competition anxiety of college varsity athletes." Eugene, Ore., Microform Publications, International Institute for Sport & Human Performance, University of Oregon. 1996.
  28. Greenwood, C.M.; Dziewaltowski, D.A. "Self-efficacy and psychological well-being of wheelchair tennis participants and wheelchair nontennis participants," *Adapted Physical Activity Quarterly*, 1990, 7 (1), Pages 12-21.
  29. Van Raalte J. "Sport performance attributions: a special case of self-serving bias?" *Australian Journal of Science and Medicine in Sport*, 1994, 26 (3-4), Pages 45-48.
  30. Ryska, T. "The roll of perceived coach support on dimensions of pre-competitive anxiety among high school tennis players." Ph.D. dissertation, University of Southern California, 1992.
  31. Loehr, J., and Schwartz, T. "The power of full engagement." 2003, New York, Free Press-Simon & Schuster.
  32. Loehr, J. "The new toughness training for sport." 1995, New York, Plume.
  33. HeadStrong Cognitive Fitness Centre, "Co-ordination determines brain power" at [http://www.headstrongbrain.com/Blog/~B1-154/Co\\_ordination\\_determines\\_brain\\_power](http://www.headstrongbrain.com/Blog/~B1-154/Co_ordination_determines_brain_power). Posted Sept. 20, 2007.
  34. Daino, A. Personality traits of adolescent tennis players. *International Journal of Sport Psychology*, 1985: 16 (2), Pages 120-125.
  35. Loehr, J. "The sixteen-second cure," DVD, 2nd edition, 2007, Orlando, Fla., Human Performance Institute Inc.
  36. Brown, B. "Interrelationship of androgyny, self-esteem and achievement motivation of female athletes." Eugene, Ore. Microform Publications, University of Oregon. 1983
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