



Welcome to the second issue of ITF Coaches Review. This issue features articles from Australia, Canada, Germany and Britain. A variety of subjects are covered including Biomechanics, Periodisation, Concentration and Fitness. There are also some interesting statistics on the age breakdowns of the top male and female players, which have been compiled by Tennis Canada and our own ITF Computer Department. Some of these figures, especially those related to the men's game came as a surprise to us. We are sure that they will generate a great deal of discussion among coaches around the world.

ITF Coaches Review was created to act as a forum for new research in tennis and to provide invaluable information to performance coaches wherever they might be. The feedback that we have so far received from coaches as a result of the publication has been very positive. However, we do need the help of the world's coaching fraternity to ensure that ITF Coaches Review contains the most up to date tennis information. We would like to encourage coaches involved in tennis related research to submit articles to be considered for publication. If you have any

articles which you deem relevant and worthy of inclusion in future issues please forward them to us for consideration.

In this issue you will see further details on the 8th ITF Worldwide Coaches Workshop which will be hosted by the United States Tennis Association in Key Biscayne, Florida in November. The list of speakers reads like a who's who of tennis experts. We expect that this will be a great educational forum and we hope to see you there.

We would like to express our thanks to all those coaches who have allowed us to reproduce their work in ITF Coaches Review. We hope that you enjoy this issue and that you find the information useful to you in your work in tennis.



Doug MacCurdy
Director of Development



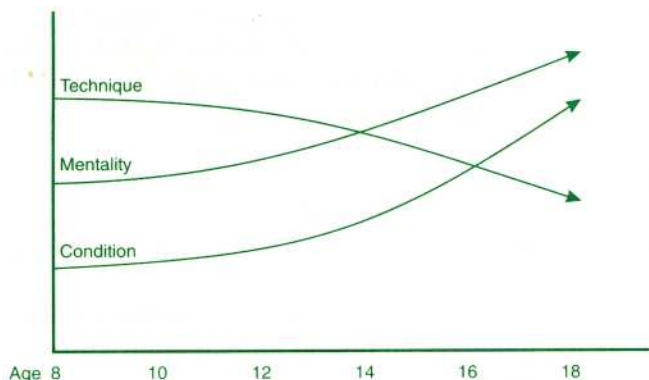
David Miley
Development Administrator

Players' Performance and Development

by Richard Schonborn

The graph below shows the effect that physical fitness, mentality and technique have on a player's performance, ie. competition results at different stages in their development.

You will see that up until the age of about 13, a player's technical competency is the most influential



*Influence of physical condition, technique and mentality on players performance during junior development
(Reference: Schonborn, German Tennis Federation)*

factor on their results.

At an early age, physical fitness does not play a major role in influencing a performance. However, this factor does begin to increase in importance after the age of 12 and continues through puberty until it eventually becomes the second most important factor to overall performance at 16.

At a young age, a player's mental toughness does not play as significant a role as the players technique in determining the player's competition results. However, at approximately 13 or 14 the player's mentality becomes the single most important factor in achieving competition success.

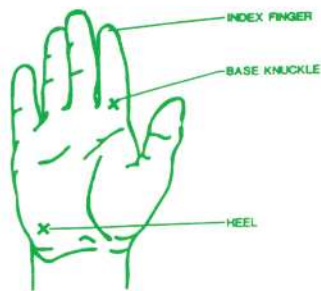
IMPLICATIONS - you should give priority to technical coaching with your players up until the age of 13 or 14. However, during this period, mental training skills should be introduced within your on-court training as and when necessary. When players reach 13 or 14, you may then place greater emphasis on mental training. You should begin to adopt a more structured approach to your player's physical conditioning from the age of 12.

Bio-Mechanics - the Semi-Western Forehand

by Tennis Australia

The following article provides some interesting facts about the stroke mechanics of the semi-western forehand. An understanding of biomechanics will improve your ability to diagnose and correct technique. It will help you to distinguish between what is fundamental to effective stroke production and what is merely cosmetic or idiosyncratic.

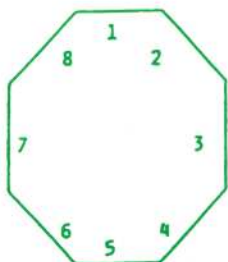
GRIP ANALYSIS



SEMI-WESTERN FOREHAND END VIEW (right-handed)

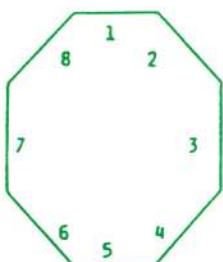
KEY

1. Top panel
2. Right top bevel
3. Right vertical panel
4. Right under bevel
5. Bottom panel
6. Left under bevel
7. Left vertical panel
8. Left top bevel



HEEL OF HAND

On panel 3 extending to panel 4 or right vertical panel extending to right under bevel



BASE KNUCKLE INDEX FINGER

On lower part of panel 3 to panel 4 or lower part of right vertical panel to right under bevel

The grip produces two important features:

1. A laying back of the wrist, and
2. A closing of the racket face on both the backswing and forward swing.

The backswing

The semi-western technique involves rotating the forearm and racket about the elbow. Generally, as the ball is hit by the opponent, the pivot is followed by a lifting of the elbow (backward movement) and turning of the shoulders in synchrony (fig 2).

To aid the backswing and shoulder turn, the left hand can be used to push the racket back (fig 2).

There are two ways to take the racket back (and many more in between).

1. From the ready position, pivot, the elbow moves backwards whilst the shoulders turn and the racket is lifted in a loop.
2. From the ready position, pivot, the elbow moves backwards whilst the shoulders turn and the racket drops below the waist before lifting to the final backswing position.

In all cases, the racket head should be in a position higher than the elbow prior to the racket moving in forward swing (fig 3).

The forward swing and hitting position (impact)

The forward swing has many important features:

- on the downward swing the knees which have been flexed (bent), begin to extend which raises the hitting shoulder, thus assisting the low to high swing pattern
- the elbow (or upper arm) is kept close to the body for stroke stability in the early stages of the forward swing (fig 4).
- elbow velocity is increased prior to impact.
- the trunk is rotated and, with the low limb drive the racket shoulder velocity is increased in the forward swing. The movements account for 10% of racket head velocity.
- the elbow is extended in the early forward swing so that the swing is flattened out.
- the right hip lifts and turns, which lifts the hitting shoulder.
- the trajectory of the racket head in the forward swing path is from low-to-high at approximately 17 degrees.
- just prior to impact, the racket trajectory increases to 47 degrees; and then follows that path. This path is primarily created by flexion of the elbow joint.

- the wrist is laid back on impact (because of the grip) (fig 5).
- the head is absolutely still and the eyes are focused on the hitting area.
- the feet are usually placed in an open stance. The left foot is 45-50 degrees to the left and in front of the right foot (fig 1). 91% of players (men and women) use open stance on the forehand.
- the racket face will remain closed through the forward swing until the impact position (because of the grip).
- the extension of the knees, together with the turning of the right hip ensures that weight is transferred along the racket head trajectory of the swing, viz. upward at 47 degrees prior to and after impact.

Note: players align the racket to the approaching ball (in the same way as with an eastern unit forehand), then increase the upward path prior to impact.

- the racket head may be slightly below the wrist on impact.
- if the racket head is substantially below the wrist, a weakened grip and reduced control may result.

The follow through

The forward swing is upwards from under the ball to the hitting position and continues up and out through the ball (at a trajectory of 47 degrees) (fig 6).

To check the follow through going out and through the ball, the arm between the elbow and shoulder should be parallel to the ground (figs 7 and 8).

There is great individuality in the final stages of the follow through. However, to prevent injury, the right foot usually swivels around and ends up level with the left foot. The racket head retains approximately 80% of its velocity after impact.

An interesting feature of the follow through action which assures that the racket head velocity is at a maximum at impact and as well reduces injury, is to lift the elbow to shoulder height after impact as the trunk rotates. If done correctly, the racket face which hits the ball will be facing up the court in the direction the ball has been hit (figs 7 and 8).

Important components of the technique are the:

- speed of the racket head
- tucked in elbow for power and stability
- initial flexion then extension of the knees, as well as hip and trunk rotation
- impact position
- forward swing pattern and follow through (hitting through the ball)

(References: Elliott B, Marsh T, and Overhen P. - "The Mechanics of the Lendl and Conventional Tennis Forehands: A Coach's Perspective" and National Sports Research Program (Second Report), August 1986 - June 1988, Australian Sports Commission, pp 17-22; Denis Colette, Australia).



Fig 1

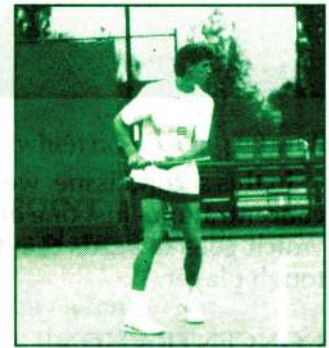


Fig 2

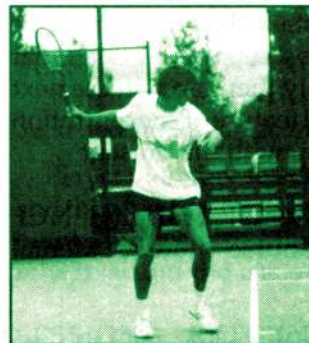


Fig 3

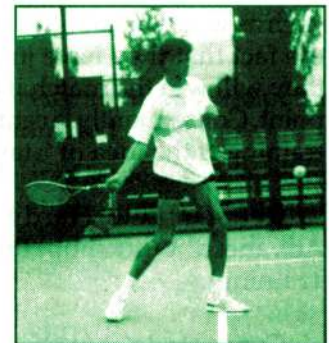


Fig 4

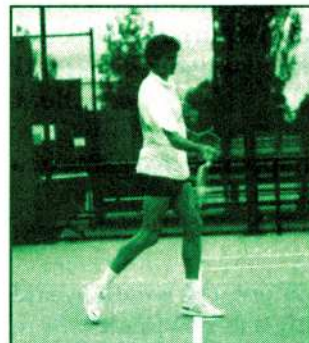


Fig 5

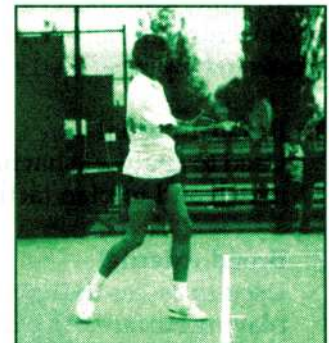


Fig 6

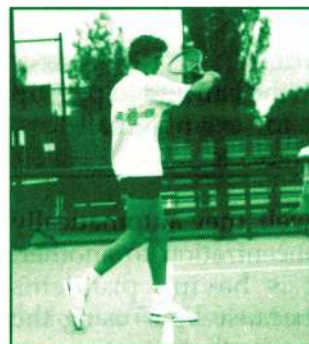


Fig 7

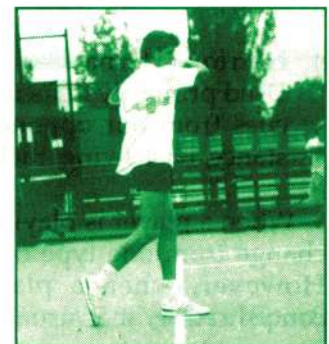


Fig 8

Sport Psychology

by Tennis Australia

In this second issue, we will take a detailed look at concentration - just one of the several mental factors which goes towards the development of a mentally tough player.

CONCENTRATION

The idea of concentration training is to help performers learn how to focus all of their attention on those things which are important to their performance.

Many performers find that the most difficult distractions come from past, distant or future events, such as worrying about a mistake they have made, or the fact that they have just lost a point, or even that they will win the match if only they can win the next point. Consequently, a central feature of concentration training is the idea of 'staying with the present'.

(Ref: Dr Lew Hardy, Mental Training, NCF Advanced Workshop Pre-Course Study - Mental Training).

'**Concentrate**' - a word used by coaches and players at all levels of the game. But what does it mean to concentrate? It is a difficult word to define. Just pause for a moment and consider what you really mean when you ask a player to concentrate. It is difficult to put into words.

An American Sport Psychologist identified 4 types of concentration, all of which are required for effective tennis to be played:

- 1. Broad-Internal**
Used to analyse what has happened in a game or a match and to plan tactics.
- 2. Broad-external**
Used to assess the environment, the weather, and playing surface. Also during a match to see where the opponent is, particularly in doubles play.
- 3. Narrow-internal**
Attention is focused on our thoughts and feelings. Used to monitor our self-talk and feelings of stress, fatigue, relaxation and pain.
- 4. Narrow-external**
Used primarily to focus on the ball and to pick up cues from our opponent, for example ball toss, stance, backswing, racket face etc.

When a player is playing well, they automatically change from one type of concentration to another. However, when a player is having problems concentrating, it is usually because he is using the incorrect type of concentration for that situation.

For example looking at the approaching player (Broad-External) when he/she should be focusing on the ball (Narrow/External), or thinking too much about a mistake (Narrow-Internal) when he/she should be concentrating on the ball toss (Narrow-External).

These examples are known as 'mismatches' and this is the reason why mistakes occur. We are using the wrong type of concentration at the wrong time. Effective concentration is using the right type of concentration at the right time.

Once this theory of concentration is understood by both coach and player, it is then easier to assist players who are not concentrating as effectively as they could.

Two different approaches of how to concentrate are outlined below:

1. SWITCH ON - SWITCH OFF

Jimmy Connors: "I'm not worrying about the next point or game or how a call might turn around the match. Instead, I try to distract myself and divert my thoughts from the pressure of the situation. In other words, I let my mind wander. I might look into the crowd to see if my kids and Patti are there or to spot the television cameras. I'll stroll back to the fence to towel off my grip, I'll dust the line with my shoe, I'll play with my strings. All I'm doing is putting my mind at ease so that once I look up to begin the next point, I'm prepared to play, ready to grind things out with as fresh a mental attitude as possible".

2. VOLUME CONTROL

Imagine your concentration being controlled by a volume control, which allows you to adjust the intensity of your concentration from low to high so that between points the player relaxes but is still aware of the match situation and what is going on around them.

It is up to you and the player to decide which is most comfortable and most effective. Depending on which technique the player uses, there a number of further techniques to make their concentration even more effective:

Triggers

The most important part of the ON/OFF and VOLUME CONTROL methods is knowing when to switch ON or increase the volume. What is required is a triggering mechanism that allows you to get back into focus before the next point.

Connors, for instance, begins focusing when he lifts his head to look up. Other suggestions are:

- Stepping over an imaginary line on the court (see diagram below)
- Self-talk, e.g. 'next point', 'let's go', 'back to work'
- slapping your thigh
- squeezing your racket grip
- wiping your hand or forehead
- adjusting your shirt sleeve

Routines

Once a routine becomes automatic, you no longer have to think about what you have to do. This reduces the drain on your mental stamina.

Once you have switched ON, use your service routine AND service return routine.

Your routines should include knowing WHAT to focus on and WHEN.

e.g. service return - Switch ON: as she steps up to the line. Focus: on the ball as it leaves her hand.

SWITCH OFF: Here is the place where you take the time to get your thoughts together. Use the full 25 seconds if you feel you need to. If you have the urge to look around at what is going on around you, do it in this area.

DO NOT step into the "serving zone" until ready.

SWITCH ON: Once over the line, your thoughts should be focused on what you need to do next.

Serving - Use your servicing routine; decide what kind of serve you want to do; decide where you want to serve to. Returning - Decide how you want to return the ball, e.g. deep, low, cross-court, chip and charge.

*** If you get distracted as you are about to serve, STOP, move away from the line and start your service routine again**

ON COURT EXERCISE

CONCENTRATION

Use: During a point

Aim: To focus on the ball when not "seeing" it well

SESSION 1 - DURING A POINT

- Ask what strategies your player currently uses.

Try the following:

- Breathe out on contact - say a long 'Yesss'
- Be a commentator calling the point score
- Talk to the ball telling it where you are going to hit it
- Return ball at same trajectory, therefore have to read the ball from opponent to you

Use: Serving and Returning

Aim: Direct focus on the ball

SESSION 2 - SERVING

3 circles to be drawn in service area. An extra point awarded if ball lands in nominated circle.

Player therefore selects desired serve before serving and then has to narrow concentration on to a particular point on the court. May want to incorporate mental rehearsal and the use of cue-words.

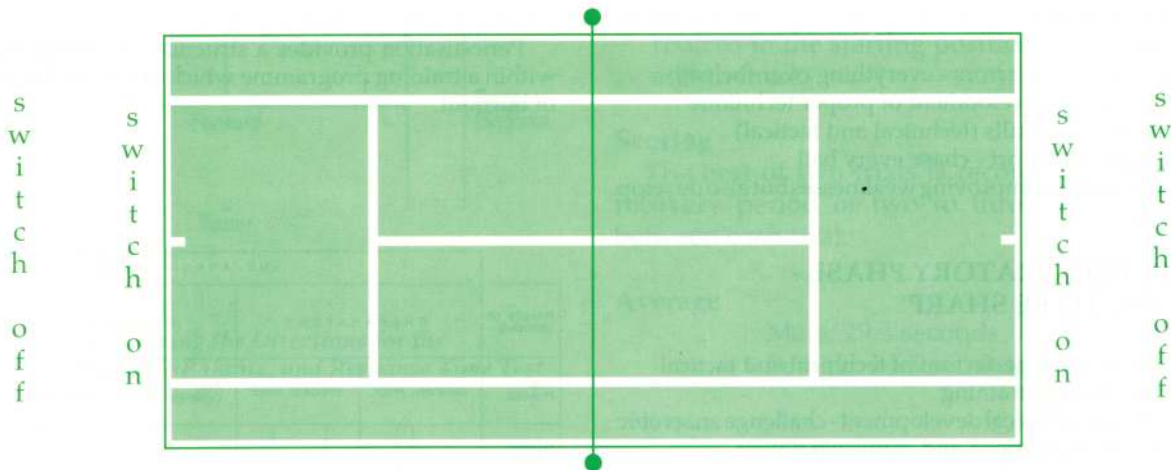
SESSION 3 - RETURN OF SERVE

(This is a difficult exercise to achieve success in, but it will help the player to focus more closely on the ball, etc)

3 balls marked with 1, 2 and 3. Aim is to pick up number on ball early and thus detect where it will be going.

1 = down the middle, 2 = wide, 3 = into the body.

If server deliberately hits the ball in the wrong place - fault.



(Ref: Denis Colette, Australia; Mark Spargo, Sports Psychologist; Tennis the Australian Ways National Sports Research Program).

Periodisation

by British Lawn Tennis Association

Periodisation is the splitting up of the year into smaller, more manageable units, each with its own objective, to ensure the best possible chance of performing well at pre-determined times of the year. In its simplest form, periodisation is the 'division of an annual plan into phases of training'. The main objective of periodisation is to balance the intensity and volume of stress with the intensity and volume of recovery.

BENEFITS OF PERIODISATION

- * Helps to avoid staleness
- * Reduces boredom
- * Reduces the risk of burnout
- * Encourages optimum physical development
- * Increases players understanding of the training programme
- * Increases motivation (player and coach)
- * Reduces the risk of injury
- * Ensures proper physical conditioning
- * Proper peaking
- * Reduces the risk of overtraining

To ensure the optimum performance of a player, the coach needs to 'time' his or her increase in performance by following the objectives of a 'peaking cycle'. This 'peaking cycle' is divided into 3 main phases:

- * Preparation phase
- * Competition phase
- * Transition phase

PERIODISATION PRINCIPLES AND TRAINING GUIDELINES

GENERAL PREPARATORY PHASE - 'LAYING SOLID FOUNDATIONS'

Main objectives:

1. High level of physical conditioning
 - challenge aerobic and strength systems
 - high volume and low intensity
 - produce a strong and resilient athlete
2. Understanding of tactical objectives
3. Learning of tennis specific movements
4. Developing the players commitment and tennis effort
5. Minimise the importance of results in competitions

Practical implications:

- * Drilling for consistency - develop rallying skills - OK to use half court
- * Reducing unforced errors - everything over the net!
- * Coach to ensure development of proper technique
- * Introduce to new skills (technical and tactical)
- * Develop players effort - chase every ball
- * Work primarily on improving weaknesses but also develop strengths

SPECIFIC PREPARATORY PHASE - 'TRAINING TO BE SHARP'

Main objectives:

1. Improvement and perfection of technical and tactical objectives through training
2. Tennis specific physical development - challenge anaerobic systems - develop speed and explosive power
3. Low volume and high intensity

Practical implications:

- * Emphasise mental skills, eg, mistake management, between point strategies
- * Serve and return training
- * Use the full court. Play practice sets. If playing twice a day,

then first session could be match play drills and second session practice sets.

- * Practice patterns that will be used in the competition and on forthcoming surface
- * Practical sessions can be slightly shorter but of high intensity and quality
- * Create high intensity competitive situations. Games of 4 points (not 11 or 21)
- * Emphasise work that has already been covered, ie, work on strengths to build self-confidence

PRE-COMPETITION PHASE - TRAINING COMPETITIONS - 'FINE TUNE YOUR COMPETITIVE SKILLS'

Main objectives:

1. Testing of the player's skill in competitive situations
2. Specific recommendations for short-term improvement
3. Maintenance of physical development
 - training to be highly tennis specific
 - high intensity and low volume

Practical implications:

- * Feedback to be TACTICAL in nature
- * Warm-up period to start the session which should be similar to the warm-up period for a match
- * Psychological peaking —> practice sessions with a psychological emphasis
 - highlight and work on strengths
- * Structure session to stimulate match work: rest ratios

COMPETITION PHASE: 'PEAKING!'

Main objectives:

1. A stage of active recovery after major competitions
2. Psychological and physiological rest and recuperation
3. Participation in other sports, eg, football, basketball, hockey, netball, etc.

The transition phase is probably the most underrated phase in tennis training!

CONCLUSION

The concept of periodisation involves the manipulation of the training volume, intensity, type and rest periods, all of which prevent overtraining of the player.

Periodisation provides a structure of variety and change within a training programme which assists in the prevention of burnout.

THE ANNUAL PLAN					
PHASES OF TRAINING	PREPARATORY		COMPETITIVE		TRANSITION
SUB-PHASES	GENERAL PREP.	SPECIFIC PREP.	PRE-COMPET.	COMPETITIVE	TRANSITION
MACRO-CYCLES					
MICRO-CYCLES					

A schematic illustration of the division of an annual plan in its phases and cycles of training.

Fitness

by Anne Quinn, Australia

In the last issue of Coaches Review Anne Quinn outlined various training principles to be incorporated into a fitness programme. The following is a tennis specific exercise that she believes should be included in every serious tennis player's fitness programme.

THE QUINN AGILITY, DYNAMIC BALANCE, AND RESPONSE TIME TEST

Purpose

This is a test designed to measure the agility, dynamic balance and response time of a tennis player - that is the ability of a tennis player to start and stop, remain balanced, to react to his opponent (the tester in this case) and the ball, and to change direction quickly and effectively while moving. This test was designed specifically for tennis players, as the movements in this test occur so frequently in a tennis match.

Equipment

1. Half a tennis court
2. Stopwatch

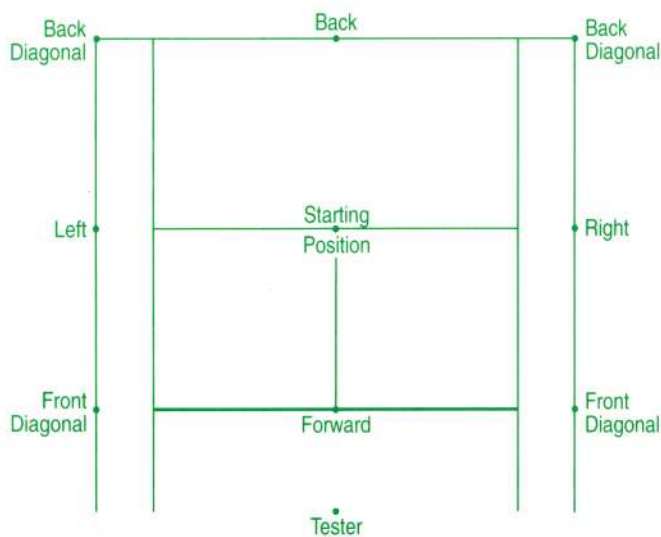


Diagram showing the Directions for the Quinn Agility, Dynamic Balance, and Response Time Test

Procedures

1. The subject begins standing in the starting position at the intersection of the service line and centre line.
2. The tester stands in front of the subject (on the other side of the court) approximately six feet back from the net. The tester is thus simulating an opponent's position.
3. Holding a ball in his hand, the tester points to a mark and at the same time calls the direction to which he is pointing. (e.g. "right"). Simultaneously, the tester starts the stopwatch, held in the other hand.
4. The subject must run quickly to that mark, touch it and return to the starting position (see diagram).
5. The tester immediately calls and points to another direction.
6. The subject then runs as quickly as possible to this direction and touches the line, then returns back to the starting position.
7. The subject only has to touch the line to which he runs, not the starting position to which he returns. (This simulates running to the sideline for a shot, bending down to hit the ball, then returning to the middle of the court ready for the next shot.)
8. It is imperative that the subject watches the tester constantly. This test simulates game situation, and thus the subject must not take his eyes off the "ball". He must run in all directions, keeping his eyes on the tester and the ball, as though the tester were an opponent.
9. This procedure is repeated eight times - that is, once to each direction.
10. However, the order must change with each trial, so that it is unpredictable. A player will have to react to the tester and the ball, just as he reacts to an opponent and the ball in a game situation.
11. The stopwatch is clicked off when the subject returns to the starting position after touching the eighth mark.

Scoring

The best of two trials is recorded as the score. A recovery period of two to three minutes is given between each trial.

Average

Male: 29.4 seconds
Female: 34.5 seconds

The “6 - 14 years old” Athlete Development Path

by Tennis Canada

Introduction

The player development path was created to provide relevant information to players, their coaches and their parents on the volume and type of training, sport activities and competition that tennis players aged 6 - 14 years should engage in for maximising their performance in the sport.

The information is presented in the form of an overview table which presents the volume and type of training, sport activities and competition for players aged:

1. 6 - 9 years 2. 8 - 12 years 3. 10 - 14 years

The volume and type (singles / doubles) of competition is also presented in the overview.

Detailed charts provide further information on:

1. Structure training
2. Unstructured training
3. Off-court training
4. Other sport activities
5. Competition and performance indicators

The information presented in this document is based on data gathered from other sources which include a paper prepared on the development of female tennis players in Canada as well as through interpretation of practical experiences associated with the development of present national squad players.

It is important to understand that the information presented provides only *guidelines* which should be viewed as minimal prerequisites for success. The rate of development of female athletes would seem to justify the need for a greater volume of training at a younger age.

ATHLETE DEVELOPMENT PATH (6 - 14 yrs - identified talented youth)

RECOMMENDED VOLUME OF SPORT ACTIVITIES / TRAINING / COMPETITION

ACTIVITY	TRAINING HOURS		
	6 - 9 yrs	8 - 12 yrs	10 - 14 yrs
ATHLETE DEVELOPMENT			
1. Structured training:			
1.1 Club training program (school year)	30	135	225 - 450
1.2 Structure program (summer)	15 - 30	50	130 - 180
1.3 Private lessons	-	60 - 80	120
1.4 Regional regroupings	-	32	60
2. Unstructured training:			
2.1 School year	20 - 30	30 - 50	80 - 100
2.2 Summer	30	30 - 50	45 - 60
3. Off-Court (Physical/Psychological)			
3.1 School year	-	50 - 70	120 - 200
3.2 Summer	-	10 - 20	30 - 50
4. Other (Phys. Ed., Other Sports)			
4.1 School year	120	120	20 - 100
4.2 Summer	60	30	5 - 20
5. Competition (match play, tournaments) i.e. ladder, multi-sport, challenge matches			
	25-35 sgls	25-60 sgls	40-70 sgls
	10-15 dbls	25-30 dbls	25-35 dbls
TOTAL TENNIS TRAINING AND SPORT ACTIVITY HOURS PER YEAR (APPROX)	275 - 300	545 - 635	835 - 1340
TOTAL TENNIS TRAINING AND SPORT ACTIVITY HOURS PER WEEK (APPROX) (based on the above 5 components)	5 - 5.6	10.5 - 12.3	16 - 25.7

TOP 100 MALE PLAYERS - AS OF 14 JUNE 1993

by John Treleven/Dave Miley

John Treleven, Computer Rankings Administrator for the ITF, recently compiled some statistics on the Top 100 male players in the world. It produced some very interesting results.

One conclusion from these figures might be that because male players are unlikely to enter the top 100 until they are at least 22, coaches should be more patient in judging the success of their players. Talented players should be encouraged not to give up too soon in their efforts to make the breakthrough into the top level of the professional game.

AVERAGE AGE OF MEN'S TOP TEN 1973-1992

Year	Average (years)	Year	Average (years)	Year	Average (years)
1973	29.2	1980	24.7	1987	25.8
1974	28.8	1981	25.4	1988	25.0
1975	28.1	1982	25.5	1989	23.8
1976	25.2	1983	25.1		
1977	25.9	1984	24.2	1990	24.8
1978	25.1	1985	24.4	1991	24.5
1979	27.1	1986	24.6	1992	23.9

AGE STATISTICS OF CURRENT TOP TEN MALE PLAYERS IN THE WORLD

Ranked/name	Date of Birth (yrs/ months)	First Ranked (Age) (yrs/ months)	First in Top 100 (Age) (yrs/ months)	First in Top 10 (Age)
1. Sampras	12.08.71	29.02.88 (16/06)	est. 28.11.88 (17/03)	10.09.90 (19/00)
2. Courier	17.08.70	13.07.87 (16/10)	est. 07.11.88 (18/02)	25.03.91 (20/07)
3. Edberg	19.01.66	27.09.82 (16/08)	est. 24.10.83 (17/09)	est. 23.09.85 (19/08)
4. Becker	22.11.67	31.10.83 (15/11)	est. 10.12.84 (17/00)	08.07.85 (17/07)
5. Bruguera	16.01.71	19.09.88 (17/08)	24.04.89 (18/03)	29.04.91 (20/03)
6. Ivanisevic	13.09.71	05.07.88 (16/09)	13.03.89 (17/06)	24.09.90 (19/00)
7. Lendl	07.03.60	12.06.78 (18/03)	est. 12.06.79 (19/03)	08.09.80 (20/06)
8. Stich	18.10.68	13.03.89 (20/04)	19.06.89 (20/08)	10.06.91 (22/08)
9. Medvedev	31.08.74	12.11.90 (16/02)	22.06.92 (17/09)	07.06.93 (18/09)
10. Korda	23.01.68	28.10.85 (17/09)	23.10.89 (21/09)	04.11.91 (23/09)
AVERAGE AGE:		(17/02)	(18/04)	(20/00)

- Average age of the top 100 male players is 24.9 years
- Only ten players were under 22 - i.e. 90% of the players are 22 or older
- 53 players were 25 or older
- only 3 players were under 20 - Medvedev (Ukraine), Enqvist (Sweden), Corretja (Spain)
- No players aged under 19 were in the top 100

Top 10 facts

- Since 1973 there have been a total of 52 players who have achieved a top ten ranking.
- Since 1973 there have been only 12 teenage top 10 male players: Borg, McEnroe, Wilander, Arias, Cash, Becker, Edberg, Agassi, Chang, Ivanisevic, Sampras, Medvedev.

CURRENT MEN'S TOP 10 (at 14 June 1993)

AVERAGE AGE - first ranked	17 years and 2 months
- entered Top 100	18 years and 4 months
- entered Top 10	20 years
- current Top 10	24 years and 2 months

RECOMMENDED BOOKS AND VIDEOS

- Science of Coaching Tennis by Groppe, Loehr, Melville, Quinn
- The Mental Game - Winning at Pressure Tennis by James Loehr
- U.S.T.A. Strength Training Video
- Strength Training for Tennis - a Practical Guide to Strength Training by U.S.T.A.

All of the above are available from:

U.S.T.A. Publications Department,
70 West Red Oak Lane,
White Plains,
New York,
NY 10604, U.S.A.
Tel: (1 914) 696 7000
Fax: (1 914) 696 7167

Road To The Top

by Tennis Canada

Listed below is an excerpt from a Tennis Canada research paper including a summary of statistics that was compiled in terms of a player's age and WTA ranking achieved from the 1990 Virginia Slims year-end rankings as of November 19, 1990.

Summary of Statistics

Average age a top 10 player gained a WTA ranking: 15.1 years
Average age a top 10 player gained a top 100 ranking: 15.4 years
Average age a top 10 player gained a top 10 ranking: 17.1 years
Current average age of top 10 players: 21.75 years

Average age a top 20 player gained a WTA ranking: 15.9 years
Average age a top 20 player gained a top 100 ranking: 16.5 years
Average age a top 20 player gained a top 10 ranking: 18.6 years
Current average age of top 20 players: 21.9 years

Average age a top 100 player gained a WTA ranking: 16.7 years
Average age a top 100 player gained a top 100 ranking: 17.9 years
Current average age of top 100 players: 22.5 years

• In order to achieve our long-term objective of producing players capable of winning the Federation Cup, we need players with the following performance results:

1 top 10 singles player
1 top 20 singles player
1 top 10 doubles player
1 top 20 doubles player

• When given the fact that the average age a top 10 player gains a WTA ranking and moves into the top 10 is between 15.1-17.1 years, we can easily predict that if a player is going to reach the top 10 in the world, she will most likely do so between the ages of 15-18!

• Therefore, the data gained from the statistical analysis is the basis of predicting future performance indicators for female squad members.

AGE	SQUAD	PERFORMANCE INDICATORS
12-14 years	World Youth Cup	Top U18 in Canada
13-15 years	WYC/Continental Cup	Top 10 ITF Jr.
15-16 years	WYC/Continental Cup	Gain a WTA ranking
15-17 years	Fed Cup	Top 100 - WTA
15-18 years	Fed Cup	Top 20 - WTA
15-18 years	Fed Cup	Top 10 - WTA

• It is important to mention that prior to age 12, the priority should be on participation, fun and development. A plan is now being developed that will focus on the development of this age group for both boys and girls.

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'Short Burst' Circuit

by Dave Reddin and Paul Dent

The reduced length of actual playing time of the points at top level, coupled with the increase in the number of strokes played in that time, suggest that today's tennis is played at a faster rate than ever before. Consequently, the game is becoming increasingly reliant on a player's ability to move to and recover from the ball contact very quickly. This 'short burst' playing characteristic necessitates that players need explosive movement. Therefore, to be successful at top level, players need to develop this type of energy.

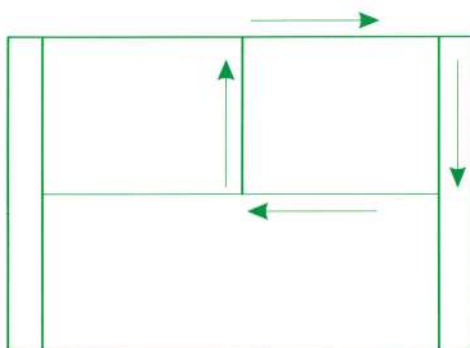
The body has three energy systems available to produce energy for muscular action.

- The Aerobic System is generally used in activities of a relatively low intensity.
- The Lactate System is an anaerobic system which generally works significantly in maximal activities of greater than approximately 8-10 seconds duration.
- The phosphocreatine (PC) system is an anaerobic system which does not produce Lactate (a factor in fatigue), but can

supply energy rapidly for high intensity effort for 10 seconds. This energy system is widely regarded as the most important for tennis players as a match requires the performance of short maximal efforts. It is of primary importance when training this particular energy system that the recovery duration is long enough to allow the PC stores in the muscle to be replenished. This recovery is an aerobic process which is actually enhanced by the performance of activity of a *low* intensity during the rest period.

For these reasons, the work to rest ratio in this circuit is 6:1, which is shown in a work interval of 10 seconds, and a recovery period of 60 seconds. Also, the recovery is active and some exercises are suggested for this. Start with one circuit and build up to 2 or 3 circuits with a 2 minute active recovery in between each circuit. The following physical conditioning circuit is designed to develop short burst activity:

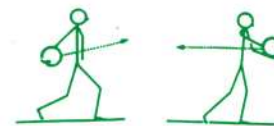
1. **AGILITY SHUTTLE RUNS OF 3 TO 4 METRES:** Place 3 cones in a straight line, with approximately 1 metre space between each. Player zig-zags up and back as many times as possible in 10 seconds.
2. **PUSH UPS** (hands wide apart; maximum number of quality press ups in 10 seconds, 100% intensity)
3. **SERVICE BOX DRILL:** Start in one corner of a service box. Do as many runs as possible in 10 seconds. (Complete the movement sequence below by always facing the net).



4. **SQUAT THRUSTS**
5. **ROLL AND RETURN DRILL:** Coach or partner stands approximately 3m away from player with a supply of tennis balls. Coach rolls or bounces ball to one side or the other of the player who has to catch the ball and return it. The coach

continues at random and the player should try to return as many balls as possible in 10 seconds.

6. **FOREHAND AND BACKHAND THROW:** Player stands approximately 2m away from a wall or partner. Player, simulating a forehand groundstroke, throws a 1kg - 1.2kg medicine ball to her partner. Partner returns the ball to the player, who quickly throws the ball back, this time simulating a backhand groundstroke using both hands. Repeat as many times as possible in 10 seconds.



Forehand & backhand toss

7. **OUT OF COURT RECOVERY DRILL:** Start on baseline 'T'. Move diagonally backwards to the right, to a point approximately 3 metres directly behind an imaginary extension of the singles sideline. Shadow the appropriate groundstroke whilst pushing off your back foot and landing on the same foot. Sprint back to the start. Repeat the same movement pattern to the left but push off and land on the other foot. Sprint back to the start. Repeat as many times as possible in 10 seconds.

ACTIVE RECOVERY

In this type of training, it is particularly important that the recovery is *active*, as this actually enhances the resynthesis of PC as well as aiding the clearance of any lactate produced. The following recovery drills should all be done at a *low* tempo, as the main aim is recovery, not further work.

COURT JOGGING: Slowly jog around the back half of the court using different steps, i.e. move from left singles side line along baseline *forwards*, move *sideways* along right singles side line, *carioca step* along service line and move *backwards* back to the start position. Continue for full minute of recovery. The performing of different steps will develop the player's co-ordination.

SKIPPING ON TENNIS BALLS: Player skips on and off one or two tennis balls gently using the balls of his feet to push the ball(s) around. (Give due care and attention to the safety factor of this exercise).

SKIPPING: Using a skipping rope, gently skip for the full minute of the recovery. This activity will improve the player's co-ordination.

Dave Reddin (BSc, MSc), Project Officer for the Sports Science Support Service, Dept of P.E. and Sports Science, Loughborough University of Technology. Dave is also fitness consultant to the North Midlands Region LTA.



8th ITF Worldwide Coaches Workshop

Hosted by the
USTA

at The Sonesta Beach Hotel and Tennis Club
Key Biscayne, Florida

31 October - 6 November 1993

Featuring Presentations by many of the world's top coaches and officials.

Among the speakers are - Charles Applewhaite, Louis Cayer, Gil de Kermadec, Pat Etcheberry, Jack Groppe, Tom Gullikson, Yuval Higger, José Higuera, Carlos Kirmayr, Daria Kopsic, Pierre Lamarche, James Loehr, Iván Molina, Alberto Riba, Lynne Rolley, Carlos Salum, Nick Saviano, Richard Schonborn, Stan Smith, Dennis Van Der Meer, Kathy Woods, Ron Woods, Frank Zlesak, Doug MacCurdy and David Miley.

ITF President Brian Tobin will be attending the Workshop and will appear on the programme.



The modules that will be covered at the conference are:

- STRATEGY AND TACTICS
- MOVEMENT AND FITNESS
- COACHING WORLD CLASS PLAYERS
- PSYCHOLOGY FOR TENNIS
- NATIONAL COACHING AND PLAYER TRAINING SYSTEMS

Each member nation may nominate 4 coaches to attend the workshop.
Application forms have been sent to all National Associations.

Coaches may also write direct to the ITF for information on the workshop.
However, all coaches wishing to attend must have the approval of their National Association.

CLOSING DATE FOR APPLICATIONS: 7 SEPTEMBER 1993



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