

The Official Coaching and Sport Science Publication of the International Tennis Federation

Editorial

Welcome to issue 36 of the ITF Coaching & Sport Science Review. We were pleased to receive your positive feedback regarding the first edition of the year, as it was the first ever published in an electronic form only. Furthermore, we would like to take this opportunity to announce that the first 16 editions of the ITF Coaching & Sport Science Review (Formerly known as: Coaches Review) are now available to download free from the ITF Coaching weblet, www.itftennis.com/coaching.

This is a monographic issue of the ITF Coaching & Sport Science Review, which is devoted to periodisation. In preparing this issue we have collated articles from coaches with more than 40 years experience and who are at the forefront of the sport science research into the periodisation of training programmes for tennis.

Some of the tennis experts who have contributed to Issue 36 include:

- E. Paul Roetert (Managing Director USTA High Performance).
- Machar Reid (Former coach of Greg Rusedski).
- Piotr Unierzyski (Tennis Professor, University School of Physical Education, Poznan, Poland).
- Iván Molina (ITF Travelling coach).
- Craig Morris (Coach Education Manager, Tennis Australia).
- Patrick McEnroe (US Davis Cup Captain).
- Jofre Porta (Coach of Carlos Moyá).
- David Sanz (Director of Coaches' Education, RFET, Spain).
- Carl Maes (Belgium Fed Cup Captain and former coach of Kim Clijsters).
- Steven Martens (Belgium Davis Cup Captain and former coach of Sabine Appelmans).

We would like to extend our gratitude to them for their help with this issue.

The articles discuss periodisation for both juniors and professionals, as well as males and females. We hope that these articles generate a great amount of discussion between coaches around the world and we would be happy to receive your feedback on any of the articles.

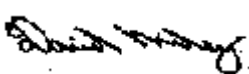
The programme for the 14th ITF WWCW has almost been finalised, and we are pleased to inform you that Arantxa Sanchez Vicario will be one of the keynote speakers. For more information on the 14th ITF WWCW and on upcoming coaching courses please visit the ITF coaching weblet.



Periodisation involves dialogue between player and coach.

The ITF Coaching weblet now contains a number of free eLearning presentations. These presentations have been produced by people such as Prof. Bruce Elliott, Ann Quinn, Machar Reid, Dr. Tim Wood and Angie Calder, on a range of topics including physical conditioning, biomechanics and recovery. Each presentation is approximately 15 minutes in length, contains numerous diagrams, has a full narration and can be viewed on any computer with internet access.

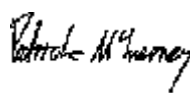
We hope you continue to take advantage of the resources provided on the weblet and that you enjoy the 36th issue of the ITF Coaching & Sport Science Review.



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Contents

INTRODUCTION TO MODERN TENNIS PERIODISATION E. Paul Roetert (USA), Machar Reid (AUS) & Miguel Crespo (ITF)	2
PERIODISATION FOR UNDER-14S Piotr Unierzyski (POL)	4
PERIODISATION IN THE ITF JUNIOR CIRCUIT Iván Molina (ITF)	6
PERIODISATION FOR 18 & UNDER FEMALE PLAYERS Craig Morris (AUS)	7
ITF SCHOOL TENNIS INITIATIVE EXAMPLES OF TENNIS LESSONS AT SCHOOLS	9
CAN PERIODISED TRAINING WORK FOR PROFESSIONAL MALE PLAYERS? E. Paul Roetert and Patrick McEnroe (USA)	11
PERIODISATION IN TOP LEVEL MEN'S TENNIS Jofre Porta and David Sanz (ESP)	12
PERIODISATION FOR PROFESSIONAL FEMALE TENNIS PLAYERS Carl Maes and Steven Martens (BEL)	13
RECOMMENDED BOOKS AND VIDEOS	16

Introduction to Modern Tennis Periodisation

By E. Paul Roetert (USTA High Performance), Machar Reid (University of Western Australia) & Miguel Crespo (ITF)

The focus of this issue of ITF Coaching & Sport Science Review is to investigate the concept of periodisation training as it relates to the sport of tennis. Specifically, we have asked some of the top experts from a variety of different countries to not only provide the theory but also, and more importantly, to focus on the practical aspects of periodisation as it relates to different ages and levels of players. Since periodised programs should be designed specifically for the individual, it is difficult to generalise, however the authors have for the purpose of these articles grouped tennis players into 14-under, 18-under and professional players.

WHAT IS PERIODISATION?

Although relatively new to the sport of tennis, the concept of periodised training was first used by the Greeks during the Olympic Games of the Ancient Era. The foundations of modern periodisation however, were laid in the former Soviet Union during the first two decades of the XX century. Since then, interest in periodisation has gradually grown and discussions between Russian and "Eastern" experts and "Western" specialists have filled books, articles and presentations.

Simply put, periodisation can be considered a process of structuring training into phases to maximise athletes' chances of achieving peak performance, and therefore their competitive goals (Bompa, 1999). Each phase contains different training contents largely reflecting that phase's generic goal: preparation, competition, peaking, and transition. They are also organised into, or to comprise three types of cycles: microcycle, mesocycle, and macrocycle. A microcycle is generally up to 7 days, and tends to assume a very specific function: ordinary, introductory, restorative, competitive or shock (Matveyev, 1981). A mesocycle may be anywhere from 2 weeks to a few months, while a macrocycle refers to the overall training period, usually representing a year.

The General Adaptation Syndrome developed by Hans Selye in the 50's remains central to modern day periodisation (Fleck, 1999). The models however, through which this adaptation is achieved have evolved significantly over the last 20 years. Nevertheless, many coaching resources continue to refer to periodisation almost solely in terms of Matveyev's early linear or traditional model (Matveyev, 1964).

Summarised as the combination of low intensity/high volume training progressing to high intensity/low volume training so as to coincide with one or more competitive peaks during every macrocycle, the model has been widely used across sports. Generally, from a physical perspective, it consists of a hypertrophy phase, a strength phase, a power phase, and a restorative phase. The model however is not without its limitations. For example:

- It does not consider the influence of different exercises on each other in a training program, and unrealistically assumes that any one component of a program can be measured independent of the others.
- It fails to account for the player's subjective perception of the intensity and overall effects of the loading, while also paying minimal attention to player's different individual performance needs.
- The model's smooth merging of training sessions and stages may be suitable for novices but not for more advanced players. For example, an increase in intensity while maintaining the same volume has been shown to enhance performance once a player has reached a certain level.

While suitable for athletes of certain sports and certain levels of mastery, it is neither the only periodisation scheme nor the most applicable in all situations, and obviously not in high performance tennis. For this reason, coaches and trainers have started to employ alternative means of periodising training.

PERIODISATION IN TENNIS

Periodisation in tennis can be quite complicated due to a number of factors. First and foremost, tennis does not have an official off-season like many other sports. Tennis players don't have the luxury of just one major event every four years (the Olympics) or even one or two major events per year. In fact, tennis with its many different ranking systems and different levels of tournaments offers many different opportunities for all levels of players to compete each and every week of the year. As an example top professionals and juniors try to "peak" for the Grand Slam tournaments

(the juniors obviously for the junior Grand Slams), but at the same time are cognisant of the need to play well at other tournaments to improve or "protect" their rankings. To make things even more complicated, it makes a big difference if tennis players: 1. lose in the first round of a tournament or make it all the way to the finals, 2. have a long or short match (or series of matches), 3. have to travel a long way to reach the tournament, 4. play in a very hot and humid environment (or switch environments regularly), and 5. compete on different court surfaces.

All of these variables have a major impact on the type and quality of training, and in many ways accentuate the problems associated with the traditional linear model of periodisation proposed by Matveyev. With this in mind, coaches should consider the merits of applying the following periodisation models to tennis training (Table 1, Siff and Verkhoshansky, 1996). More globally, they should also evaluate how these different models can fit as part of an overall player development plan. That is, if as research suggests it takes 8-12 years or 10,000 hours of training for a talented player to reach the game's elite (Bloom, 1985; Ericsson and Charness, 1994; Salmela, Young and Kallio, 1998), periodisation should most certainly become increasingly non-linear as players mature.



Periodisation is important for both junior and senior players.

Model	Characteristics
Wave	Smooth wave-like variations of the load over definite phases, with volume during the competitive phase ~10-15% lower than the maximum that is reached during the preparatory phase (Matveyev, 1981).
Step	Endorsed by researchers such as Yakolev and Ermakov, it involves abrupt step-like alternation of loads of different intensity (light, medium, heavy) over the short-term and long-term. At the short-term level, the training load is varied sharply from session to session, and in the weekly and monthly cycles. Its success has been corroborated by the research of several workers (Vorobyev, 1978).
Combination	Equal distribution of training loads comprising of strength and technical skills work. Increase in strength without concurrent improvement in sport-specific skills training is considered inefficient.
Undulating	Wave-like concentration of loading with a given primary emphasis for about 5-10 weeks at a time. Each concentrated load with one emphasis acts as the foundation for the next load with a different primary emphasis, so that pronounced adaptation occurs in time for major competitions. This method is intended for more highly qualified players and must be prescribed intelligently to avoid overtraining during any given phase. It actually adjusts the sets, reps, speed of movement (tempo), and rest period every single workout, and has been proven to be more effective in inducing maximum strength gains than traditional linear or alternating models.
Pendulum	Smooth, uniform, rhythmical alternation of the different components of training.
Overreaching	Volume or intensity is increased for a short period of time (one to two weeks), followed by a return to "normal" training. This method is used primarily with advanced strength trained athletes.
Other	Long-term training can be organised according to perceived daily maximum loading, intuitive or ad hoc prescription on a short-term basis, fairly random use of supplementary training methods, up and down pyramiding, etc.

Table 1. Periodisation models for tennis training.

TRAINING PRINCIPLES

Regardless of the age or level of the player, the success of any periodised program requires that some key training principles are followed.

1. Planning: Planning for the year should be methodical and based on scientific methods and knowledge. This will help players achieve the highest level of training and performance. Long term as well as short term plans should be developed. There should be enough flexibility in these plans to allow for variation depending on successes and failures as well as injuries and other unplanned for factors. Plans should be made for the different phases of periodisation, training weeks, tournament weeks, longer training sessions (no match or short match days) and short training sessions (long match days).

2. Volume: This is also known as the duration or the amount of work players perform or how long they train. This concept is often misunderstood, especially by junior players. It is not the quantity of time spent in training that makes a player better, rather it is the quality of time spent in training both on and off the court that helps a player improve.

3. Intensity: Intensity indicates how hard a player trains. This concept clearly ties in to the idea of quality vs. quantity. It is much better for example to have a very intense two-hour training session, than a lackluster four-hour training session.

4. Frequency: This concept deals with how often a player trains. Also closely related to

volume and intensity, the frequency of training has to be closely monitored by coaches. Rest and recovery are as important to a proper training program as all the other variables, both from a physiological and a psychological perspective.

5. Specificity: This concept relates to how similar the training is to the actual demands of tennis. It doesn't necessarily mean that the movement patterns used during training have to mimic the sport. In fact, in many cases the opposite is true. Antagonist muscles may actually have to be trained concentrically to provide much needed muscular balance for tennis players.

6. Variation: How often do players vary their training? Players can get stale if coaches do not apply enough variation in the day-to-day training programs. Again, this principle applies to both on and off-court training. In addition to preventing burnout, players will also train muscle groups in a variety of ways which will add to the overall enjoyment of their training program.

SUMMARY

Coaches and players have long been aware of the benefit of changing the training stimulus at regular or even irregular intervals. Tapering training volume prior to competition, planned periods of active rest, and interspersing power and strength workouts to challenge different energy systems are all attempts to elicit adaptation, and improve performance, in tennis players. To do this consistently and with planned intent, coaches should look to make use of the emerging models of periodisation that

are likely to better accommodate the game's unique matchplay, training and travel demands.

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Periodisation for Under-14s

By Piotr Unierzyski (University School of Physical Education, Poznan, Poland)

INTRODUCTION

In my article published in Issue 31 of ITF CSSR (Unierzyski, 2003) I presented some basic information relating to the planning and periodisation undertaken for tennis players aged 12-14. Now, in reinforcing some of the most important points from that article, I would like to highlight specific and practical training objectives for this age group. They are derived from personal experience and the collective thoughts of some of the tennis world's foremost experts, while being consolidated by research that has illustrated tennis to be a late specialisation sport. Here, the type, intensity and volume of training performed by players in the 12-14 age bracket is considered all-important (McCraw, 2002). Indeed, we know that many of the world's current, elite players (i.e. Federer and Henin) did not undertake heavy or "professional" training loads at these ages.

Generally, it is agreed that a player's long-term career plan should be divided up into shorter periods characterised by different training goals. Players aged 12-14 should follow the training stage called Semi-Specialised Training or the "Learning to Train Stage" (Balyi, 2003) or "Building up Training" (Schonborn, 1993). Semantics aside, it is the general philosophy and common characteristics of this stage that become important:

- Broad motoric development is critical but, at the same time, training must increasingly target the factors that limit tennis performance.
- Concerted periodisation efforts

should commence to assist players:

- Achieve training goals.
- Maintain a balance between general and tennis-specific training, competition and the development of motor abilities (i.e. speed and endurance, strength and power).
- Co-ordinate and plan appropriate training intensities, volumes and loads.
- Respect their biological development (through super compensation, hypertrophy, rest and recovery etc.).
- Accelerate their overall game development.
- Reduce the risk of injuries, overtraining and burnout.
- However, the aim of planning with players of this age should not be to provide for "peaking".
 - No peaking at the age of 12.
 - One peak at the age of 13 can be planned, but the goal needs to be "to peak in order to learn how to peak".
 - Two peaks can be scheduled for 14 year old players (for extremely well-prepared and talented players the plan can be divided into 3 cycles with three peaks), but it remains important to have relatively long training/preparatory periods.
- The younger/less experienced players are, the more time they need to learn/improve particular skills. It therefore follows that these players should practice proportionately more and partake in longer preparatory periods than advanced juniors and professionals.
- The quantity and QUALITY of training is important (van Aken, 1999).

- An annual plan, "doubled" with two preparatory and two competitive phases, is appropriate.
- Training methods will differ to those used for professional players. For example, interval, anaerobic lactic and heavy strength training tend not to be recommended for 12-14 year olds.
- From 15-16 (girls) and 17-18 (boys) years of age, planning and periodisation takes on a philosophy and structure similar to that adopted with professional players. Improvement is still important, but programs should be tailored to elicit peak performance at the most important event(s) and less important tournaments used to optimise preparation.
- The structure of all cycles should take into account the school calendar (i.e. holidays).

An overall example for this period is depicted in figure 1.

TRAINING OBJECTIVES FOR PLAYERS BETWEEN 12 AND 14 (THE FOUNDATION OF TRAINING PLANS)

Technical tactical development

A talented 12 year old player normally possesses sound technique, so typical technical (movement-oriented) training may be used to a lesser extent than with pre-pubertal (± 11 years old) children (Pankhurst, 1999). The main goal of tactical-technical training at this age is to help players develop an all-round game, which will be the basis for the refinement of future, individual gamestyles. More specifically, the objectives will be:

- To learn to play in all five game situations and use five basic tactics (i.e. assuming court position close to the baseline, stepping in, hitting on the rise, opening the court, and realising different ways of approaching the net) confidently and positively.
- Improve shot precision and automaticity in all game situations. For example, at the age of 13-14 a player should be able to differentiate benefits of long-short crosscourt, long down-the-line and short crosscourt, etc.

Month Age	10	11	12	1	2	3	4	5	6	7	8	9	
11	No Year-Round Periodisation												
11-12	Prep. 1			Comp. 1		Prep. 2				Comp. 2			T r a n s i t i o n
12-13	Prep. 1			Comp. 1		Prep. 2				Comp. 2			
13-14	Prep. 1			Comp. 1		Prep. 2				Comp. 2			
14	Prep. 1			Comp. 1		Prep. 2		Comp. 2 (3?)					
14-15	Prep. 1		Comp. 1				Prep. 2	Comp. 2		Prep. 3	Comp. 3		

Figure 1. Example of general year round training plans for different age groups.

- From 13-14 years of age, players should gradually begin to create their own, individual gamestyles. In doing so, these players should learn their own physical, mental, and tactical-technical strengths and limitations, and make an effort to use their favourite shots and shot combinations (Pestre, 1998). A tactical, game-based approach punctuated by open and semi-open drills should be used to help players reach this goal (closed drills may be used if technical refinement is needed).
- Group-lessons prevail (individual instruction may be required for exceptional talents), but individualised programming or differentiation of tasks is important (Krolak, 1990).

Physical development and conditioning

Obviously, there are some generalisations that can be made regarding physical training with players of these ages however, due to differences in chronological and biological age and associated physical diversity, training loads should be individually prescribed. In general terms the overriding physical training objective is to transfer all-round fitness into tennis-specific fitness (van Aken, 1999). The development of co-ordination, speed, agility, balance and footwork (factors limiting tennis performance) therefore become the physical training priorities, and should be worked more comprehensively on-court (Strzelczyk, Wachowski, & Kowalski, 1991). Other primary training contents include:

- Further improvement in dynamic, explosive and general strength.
- Injury prevention (stretching, core stability).
- Endurance (predominantly aerobic, before shifting to more anaerobic

after the age of 13-14).

- Enhance overall sporting prowess: ability to play 3-4 ball games proficiently.

Here, as it is almost impossible to maximise all physical abilities, a talented player should look to develop all (or almost all) abilities to a good (average or better) level.

Mental and psychological training /theoretical knowledge

To continue maturing, players need to learn to become more independent and to take more responsibility for their own decisions, on and off the court (Gabler & Zein, 1984) The coach's role is to facilitate players along this path through the use of effective questions and by allowing players to make and learn from their mistakes (van Fraayenhoven, 1999). As part of this, the use of open drills that challenge a player's decision-making can be important. Similarly, as players start to travel regularly at these ages, they need to learn to:

- Understand and manage stress, and cope with under- or over-arousal.
- Use routines during competitions (including warm-ups, match evaluations, signing in for doubles, reserving practice courts, etc).
- Develop individual rituals, learning and using relaxation / concentration techniques.
- Participate according to the game's rules and tournament's regulations.

To foster their independence, players should also:

- Try their best in all training sessions and matches.
- Understand the importance of rest and regeneration.
- Appreciate the potential benefits of visualisation.
- Be cognisant of the PLAYER - COACH -

PARENT dynamic.

- Develop a basic understanding of training principles and the importance of planning.
- Pack their own bags and prepare their equipment (by the age of 12).
- Be on time.
- Keep a training diary.

Tournaments

Tournaments serve under-14 players entirely different purposes than they do professional players. Matchplay should support the training process and not interfere with the periodised plan's goals. That is, tournament planning should occur subsequent to the periodised plan (i.e. first prepare the plan, then search for suitable events), and the number of tournaments/matches per year should be specific to the players' age, skill, mentality and physical condition so as to avoid burnout and optimise development. To this end, players should play different kinds of tournaments and in different age groups, all the while endeavouring to maintain win:loss ratios between 3:1 and 2:1 (see Table 1 below). In summary, these junior competitors should participate in competition with a view to (Grosser, Loehr, Schonborn, & Weber, 1996):

- Enhance their performance, motivation and experience.
- Discover the nuances that characterise the travelling life of a tennis player.
- Build independence.
- Learn how to implement tactics/techniques in close matches.

All of these factors should assume considerably more importance than winning or improving one's under-14 ranking (Lubbers & Gould, 2003).

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	Age		
	12	13	14
Maximum number of matches per year	50 / 30	60 / 30	70/35
Maximum number of international tournaments per year	6	6-7	9 + indiv & team (e.g. European Champs)
Maximum number of consecutive tournaments	2	2	2-3
Length of preparatory periods (weeks):			
1st/	14-16	12-15	10-12
2nd	12-14	10-13	4-6
/3rd	X	X	4-6
Total amount of training hours per year	520-600	550-700	600-800

Table 1. Data on tournaments and training hours for 14 & Under players.

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Periodisation in the ITF Junior Circuit (A Case Study: The ITF Junior Team)

By Ivan Molina (ITF Travelling Coach)

INTRODUCTION

This periodised plan is based on the work performed with players from the ITF Junior boys team during their 8 week European tour. The two months see the players participate in 7 tournaments (all of which award players' Junior ranking points except one) interspersed with one training week on England's grass. The tour commences in Santa Croce and culminates at Wimbledon, with players playing four events on clay and the remaining weeks on grass.

Some points to consider in the implementation of this plan:

- Team members are of different nationalities and are ranked in the ITF Junior Circuit's Top 40.
- The players arrive physically prepared to compete.

- Prior to the first tournament, a meeting is held in which the players and the coaches discuss and agree to expectations relating to tour performance and etiquette.
- After the first round of matches, the coach individually meets with each player to determine the player's matchplay and training objectives for the tour.

While players will have established their own individualised goals, the periodised plan will be tailored to assist all players in the following ways:

- Achieve maximal or peak performances during the tour, preferably at one of the Grand Slams.
- Adapt to training and matchplay load through appropriately scheduled

recovery that also considers a player's personality and training background.

- Working through the use of goal setting (work toward the matchplay and training objectives that were established by player and coach).
- Improve their games.
- Acquire international travel and tournament experience.
- Prepare for competition professionally.
- Physically and psychologically adapt to changes in surface.
- Socialise with players of different nationalities and cultures.

TRAINING CONTENTS

With these objectives in mind, training contents will vary between players but in general terms it may include the work depicted in Table 1.

Technical	Tactical	Physical	Mental
Forehand: - Improve trunk rotation to facilitate racquet acceleration. - Work on the arrival to and recovery from wide, open stance shots. Backhand: - Improve racquet acceleration when placed down-the-line. First serve: - Develop shoulder and trunk rotation in their different planes so as to increase serving power and consistency. Second serve: - Displace racquet-ball impact further forward to reduce emphasis placed on serve spin, and increase serve speed. Volleys: - Practice of the first low volley to the open court and footwork for the next volley. The return: - Improve balance; shorten backswings while working to build racquet speed in the forward swings to impact. Grass court: - Prepare lower to the court (ready positions characterised by more knee flexion). - Attend to serve and return comprehensively in training.	- Work game situations, specific to each player's style of play, while encouraging players to take the initiative. - Assist players to play further up the court, positioning themselves closer to the baseline. - Develop their ability to open the court through practice of "semi-angled" crosscourt shots (i.e. through ¾ court). - Move forward to meet half court balls on the rise. - Develop patterns of play, where each shot in the sequence builds or capitalises on the preceding shot. - Emphasise depth and placement of the return when playing on clay courts. - Help players (identify when to) take advantage of good shots or an off balance opponent by approaching the net.	- Vary warm-ups with the inclusion of some dynamic flexibility exercises and games. - At least 5 times per week, endeavour to work speed, reaction, coordination and explosive strength. Each exercise should last no more than 10 seconds and the session should be completed within 30-40 minutes (not including the warm-up). - Train anaerobic endurance 1-2/week with exercises lasting ~25 seconds. Perform 3 sets of each and employ a work:rest ratio of 1:1. A match of football can also provide players a viable anaerobic training alternative. Players should refrain from completing these sessions while still alive in the singles. - Four-five times per week players should perform 3 sets of 8 repetitions of weighted (racquet + 0.45kg) groundstroke, serve and volley swing throughs. They can even be performed on match days (as a warm-up) and emphasis should be placed on body and racquet acceleration. - Exercises to strengthen the musculature of the trunk and lower back should be performed 3 - 4 times weekly. - Players should complete at least 15 minutes of stretching after each practice session and match.	- Help the players become accustomed with the importance of rituals pre-, during and post-matches. - Reinforce 100% effort as a means to demonstrate their desire and ambition during matchplay. - Bestow upon them the need to learn to accept errors. - Foster the habit that is discipline. - Encourage them to plan and analyse their matches. - Work on them maintaining their minds in the present, and portraying good posture and positive body language.

Table 1. Example of training contents for a junior team on tour.

Periodisation for 18&Under Female Players

By Craig Morris (Coach Education Manager, Tennis Australia, Australia)

INTRODUCTION

In working with female athletes from any sport, it is paramount that these athletes have an understanding of their development path. Empirically, my work with the female tennis playing population has illustrated - time and time again - that players do desire to be part of the planning process. When understood and nurtured by the coach, the subsequent sense of ownership players typically develop over their progress can be an important precursor to future success. As part of this planning process however, the coach should be ever mindful of the need to match the annual plan and the needs of the athlete.

This article will address the most pressing issues in working with and planning an annual periodised plan for female tennis players. It will relate major factors directly back to the periodised plan and give recommendations to coaches working with junior female players. First and foremost however, it will present an example of a periodised plan for an Australian junior female player, which will serve as a template for further discussion (Figure 1).

RECOMMENDATION 1. PLAYER INPUT INTO THE PERIODISATION PLAN

As aforementioned, female players should be involved in planning the annual plan. Empowering them in this fashion is likely to result in athletes that are more independent and that approach training and tournament play more positively.

Any successful coach-player relationship is a joint partnership, and enabling the athlete to have input into the plan, helps to build this relationship.

RECOMMENDATION 2. TOURNAMENT SCHEDULE

When structuring a tournament schedule, particularly when travelling from Australia, I found that three to five week trips were ideal. The players responded favourably and most positively to tours in which they could fully commit physically, emotionally and psychologically. After "x" amount of time or "x" number of weeks, players begin to fatigue, and irrespective of how that fatigue manifests, its effects can quickly transform a 'good' tour into one that is counterproductive from a development perspective. That said, it does take time for players to establish themselves on tour; to adapt emotionally and physically to the environment and to the rigors of competition, so tours do need to be of sufficient duration to allow these types of adaptations to take place. For these reasons, you will see that the tournament blocks in

Figure 1 last for no longer than five weeks, and that event prioritisation and peak performance is typically pitched toward week two or three of the tour.

RECOMMENDATION 3. TRAINING WEEKS FOR DEVELOPMENT

In piecing together the annual plan, enough time needs to be allocated to the player's game development. For female players, these specific training blocks are essential to best prepare them physically and mentally for competition. Oftentimes, female players stand to benefit the most if these training blocks (preparatory phase / four to six weeks) are not rushed, but rather fuelled by the coach's support and confidence. Females will often highlight these preparatory phases as the keys for their competitive success, and unless they feel comfortable throughout these phases, they are likely to approach competition anxiously. Clearly, it is the role of coaches to prepare their athletes, physically, mentally, technically and tactically, however I would also argue that in preparing athletes (female and male), the focus should be on them as individuals, which would include addressing areas such as emotional stability (Recommendation 5).

RECOMMENDATION 4. PROGRAM CONTINUITY

As coaches it is essential to understand the phases of planning. This understanding allows coaches to maintain the program's goals in perspective and more effectively communicate with their players. As alluded to in Recommendation 3, the preparation phase warrants a special mention in a coach's work with female players. However, this is not to diminish the importance of the other phases. Competition is often the most anxious time for female players, and pre-competition phases are a must if players are to build their competitive confidence (a quality that reflects how individuals feel about their game and importantly the work they have done). These phases should commence at least two weeks prior to the start of a tour. At the completion of the competitive phase (tour) an enormous amount of energy has been expended and the coach MUST respect the transition phase (complete / active rest), as highlighted in Figure 1.

RECOMMENDATION 5. HOLISTIC APPROACH TO DEVELOPMENT

A passion of mine is that all coaches consider the individual first and foremost in the development of any annual plan. Regardless of whether the athlete is male or female, this is a key to successful planning and the maintenance of a strong relationship with your athlete. The annual plan provides the

direction and guidance needed to achieve the goals set at the beginning of the journey, while the success of a coach and athlete often and ultimately lies in their relationship and the confidence they have in one and other. A confidence; coaches can nurture with female players by demonstrating a duty of care to the individuals, not the tennis players.

That is, central to the effectiveness of all planning, is the coaches' knowledge of their athletes: knowing how they respond in different situations and planning accordingly. If a player needs variation in the program, build it in; if the coach sees that a player is struggling, allow for flexibility; and if a player thrives in a certain environment, create it! It is this understanding of athletes that will reward your program with success.

RECOMMENDATION 6. VARIATIONS IN TRAINING / REWARD GAINS

Keeping players fresh and focussed is all-important. It's essential on tour, but just as necessary during the different phases of the periodised plan. Although there are times where players will train whilst fatigued, overall development is maximised when players can respond effectively, consistently. When planning your weekly cycle (microcycle) allow for recovery - physical and mental - and vary the training stimulus to ready the nervous system to establish successful motor patterns of behaviour.

Lastly, reward your players' gains. If they have performed or trained exceptionally well, reward them. Athletes appreciate this humanistic approach and it fosters a successful learning environment.

CONCLUSION

In summary, my coaching and work with female athletes have amounted to some of the most rewarding times of my life. The relationships that were developed remain where our professional associations may not, and are based on respect and friendship.

Forging a successful career as a professional, female tennis player is extremely difficult. Indeed, it presents daily challenges to both player and coach. However, coaches who know their players well and possess a sound understanding of planning are well positioned to create pathways and learning environments that will facilitate players in realising their full potential.

2 ONE HOUR LESSONS FOR CHILDREN 5 - 8 YRS OLD

LESSON 23	Theme: RECEIVING AND PROPELLING WITH CO-OPERATION
Objective	To hit a tossed ball into a target zone.
Warm up	<u>Ball block:</u> Students stand behind the line, teacher rolls balls to them. They have to block them. Student who blocks more balls wins.
Games/Exercises	<u>Baseball tennis:</u> Students are grouped in threes: one feeder, one hitter and one catcher. The feeder lets the ball bounce, the hitter hits it over the net, and the catcher has to catch the ball before it bounces. After 10 hits they change positions. Team with more balls caught wins.
Variations	Changing the racket face, changing the target area, changing the hitting zone, changing the toss characteristics, etc.



LESSON 24	Theme: HOLDING , COMPETING AND MOBILITY
Objective	To avoid the opponent while maintaining control of a ball on one's racket.
Warm up	<u>Racket goalkeeper:</u> Teacher rolls balls to each student with his racket. They have to block and return it to the teacher with their racket. Student who blocks more balls wins.
Games/Exercises	<u>Cats and rats:</u> Students form 2 teams. Each student has to hold a ball on the racket face. The "cats" team should avoid the "rats" team to reach the "safe zone" by touching their racket and make the rats lose the ball.
Variations	Try to make the opponent's ball fall without dropping yours by touching his racket, moving about controlling the ball and avoiding contact with others, etc.

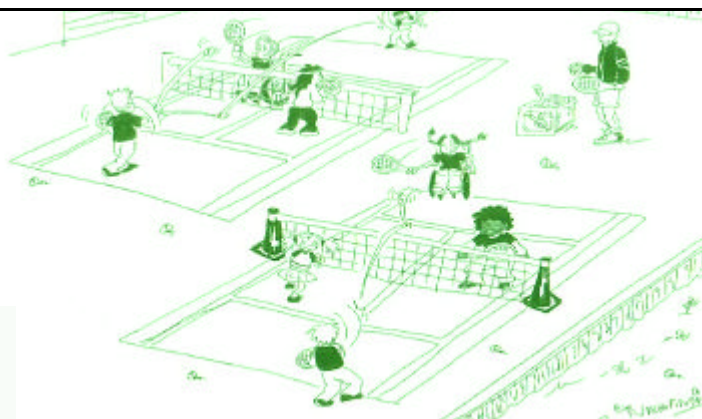


2 ONE HOUR LESSONS FOR CHILDREN 8 - 10 YRS OLD

LESSON 23	Theme: PROPELLING, RECEIVING AND CO-OPERATING: SERVE AND VOLLEY
Objective	To develop the strokes which are used by all students to start a point and to volley.
Warm up	<u>Shadow match:</u> Students in 2's. They play a match one against another shadowing the different strokes of each point.
Games/Exercises	<u>Run and hit:</u> Students rally in 2's. Student A serves to a specific zone in the court and runs to the net, B returns the serve nicely to A for volleying and they start rallying. The team with more shots hit is the winner. Students rotate positions.
Variations	The serve, the return of serve, and the volley, etc.



LESSON 24	Theme: PROPELLING, RECEIVING, CO-OPERATING AND COMPETING: PLAYING DOUBLES
Objective	To introduce the concept of doubles and to give students an understanding of the intentions of all students on the doubles court.
Warm up	<u>The ball is hot:</u> Each student has a ball which they should not hold for more than 2-3 seconds, before they throw it or roll it away from themselves. They then have to pick it up as quickly as possible before releasing it again.
Games/Exercises	<u>Doubles Masters:</u> Regular doubles play. Each team serves four points in a row. Server alternates serving to both students in the opposite team. Student on the same team alternate serving after four points as well. Students rotate positions.
Variations	"Four students with one ball", student intentions: server, receiver, server's partner, receiver's partner, etc.



Can Periodised Training Work for Professional Male Players?

By E. Paul Roetert (USTA High Performance) and Patrick McEnroe (US Davis Cup Captain)

INTRODUCTION

As mentioned in one of the earlier articles, periodised training is a method for organising the training activities of a player to minimise the chances of overtraining and optimise the chances of achieving peak performance. Periodised training has been around for a long time and has been implemented successfully in many different sports such as swimming, track and field and weightlifting. While the theory of periodisation makes sense for tennis as well, actually putting this concept into practice on the professional tour is more complicated than it appears on the surface for a number of reasons. One of which is that the training needs for each player might be quite different. Another reason is that the daily, weekly and monthly playing schedules of players are also likely to be different. For the purposes of this article, we will focus on some practical concerns that can influence both the training schedule as well as the playing schedule on the ATP Tour (men's professional tour). Instead of focussing on how to design an actual training program, we will examine some of the reasons periodised training can be difficult to implement in tennis and provide some potential solutions.

TENNIS DOES NOT HAVE AN OFF-SEASON

Traditionally, periodised training plans have used the off-season as the time to build a foundation of strength and conditioning that will carry the player through the competitive season. In tennis, there is no off-season and players can compete in a tournament almost every week of the year if they so desire. The question of whether tennis needs a well-defined off-season is a topic that has been hotly debated for quite a while now. The problem is that it is not so easy to solve. There are many different tournaments on the calendar and all tournament directors believe their tournament to be very important. Indeed a particular tournament may be the only event in that country (a great way to promote the sport there), have a wonderful history and feature a great turnout of spectators. These are just a few reasons why it is not so easy to move dates around for tournaments or worse why to eliminate a tournament from the calendar.

Currently, the Tour uses December as the unofficial "off-season". Compared to other

sports, this is clearly a very short off-season. However, considering that tennis is such a global sport and so popular in many countries (in many countries tennis is the #2 sport behind soccer), having many tournaments helps the popularity of the sport. From a periodisation perspective, players have to individualise their training programs and tailor them to their own specific needs. Their main focus should be on being able to perform at the highest level while staying injury free. A key for all players should be to build mini breaks into their schedules so they can have adequate recovery between tournaments since the tournament schedule does not do this automatically. For example, a player may want to play three tournaments in a row and then take a week off. More time off might be needed if the player is working on specific technique changes.

THE GRAND SLAM TOURNAMENTS ARE NOT SPACED OUT EVENLY

The simplest way to design a periodised training program would appear to be to build it around the four Grand Slam tournaments with the goal of peaking at each of these events. One major problem with that strategy is that these tournaments are not spread out evenly throughout the year making it difficult to design planned "peaks" into a player's training plan. In particular, the French Open is too close to Wimbledon to allow for true transition and preparatory phases. Therefore, a different training strategy has to be employed between these two events. A very short break immediately following the French (depending on the player's success at the French) is recommended, but the training will generally stay at a maintenance level. Each of the other breaks between Grand Slams allow for adequate recovery and build-up prior to the following tournament.

RANKING LEVEL AND MONEY PLAY A MAJOR FACTOR

If I am a player ranked in the top 10 in the world, I tend to have the luxury of choosing the tournaments I want to play for a number of reasons. First, the world's best players typically play all the top events where most of the money is available so their ranking and bank account are in good shape. Second, because they make a lot of money

these players can choose to play a schedule that allows them to take some time off at strategic points in the year to recover, train and work on their games. The lower ranked players have to play almost each and every week to earn enough money to make a living, this allows for little time off to recuperate or work on their games.

EACH WEEK IS DIFFERENT DEPENDING ON YOUR SUCCESS

This is a tricky topic as well. Top players who get to the finals each week have a number of ancillary benefits that lower ranked players do not. First off, of course the top players don't have the financial worry of getting from tournament to tournament. The stress of having to qualify is obviously not there either. Lower ranked players typically have to decide to stay at a tournament after losing or move on to the next tournament as soon as possible. A lot depends on how soon they have to play at the next event and who they can train with. Additionally, overtraining can become a concern, since lower ranked players typically spend a greater amount of time training while the higher ranked players spend that time in competition. Injuries tend to occur because of overtraining more than overplaying issues.



Peaking in the mens' game is a complicated process.

SOLUTIONS AND SUGGESTIONS FOR COACHES

1. Player and coach should design a yearly schedule that takes into account proper rest periods, a realistic tournament schedule and enough time for training at regular intervals.

2. Be flexible enough to make changes if your player exceeds expectations and moves to the next level, or if the player gets injured and needs to modify the training or playing schedule.

3. Train for the long run. Work on a development plan that includes both short- and long-term goals.

4. Build in rest periods after each block of playing time. Most players can only hold a true peak for about three weeks before they need a rest period. Playing beyond this time predisposes players to injury.

5. Use variety in the training schedule to help prevent boredom and staleness. Very often, playing doubles can help invigorate training.

6. If your player has the skills to have him compete at a much higher level on a specific surface, set up a periodised training programme to allow him to peak at those events.

7. Ask a strength and conditioning professional to help set up a proper training programme, but make sure you, as the coach monitor the programme. A proper programme should include flexibility, strength (endurance and power), speed, agility, coordination, and aerobic and anaerobic components.

Periodisation in Top Level Men's Tennis

By Jofre Porta (Coach of Carlos Moyà) and David Sanz (Director of Coaches' Education, RFET, Spain)

In this article we introduce the concept of periodisation in top level tennis. In highlighting the different models we also present a model which, in our opinion, adapts best to the characteristics of the professional tennis circuit. It is a model used by one of the authors, Jofre Porta, with top Spanish professional, Carlos Moyà.

INTRODUCTION

Periodisation is the systematic process of structuring training by distributing workloads to best reflect and enhance player adaptation. Ultimately the goal of periodisation becomes to assist players achieve, and to some extent, plan maximum performance.

Periodisation allows us to plan ahead and to anticipate possible contingencies that may surface during training and competition. In the elite game, it is largely governed by medium and short term goals related to the competitions in which the player participates. The nature of the tours, where

some uncertainty (injuries, illnesses, physical or mental form, competition results, match times and durations, etc) is commonplace (Porta, 2004) makes it necessary to continuously review and adapt the training and competition plan. Similar flexibility is also key in handling the varied physiological demands of competition, where different surfaces, opponents, and formats (3-5 sets) can all affect the intensity and duration of physical effort.

The adaptability of periodisation to the goals set and the individual characteristics of the player make it an excellent tool to facilitate the control of training. Thus, the improvement or deterioration of a player's form can be attributed to the work performed and changes can be made accordingly. "Periodisation drives the modification of training using well established criteria based on the continuous evaluation of training progress" (Navarro, 2003).

According to Serrano (2004) considerations in establishing the periodisation plan should include:

- Previous conditions to the plan (i.e. injury or medical history, content of previous plans).
- Set the season goals.
- Set the training conditions, contents and goals.
- Set the competition schedule.
- Define the contents in the different phases of the season.
- Define the season's testing protocols and training controls.
- Follow the plan.
- Ongoing evaluation of the plan.
- Implementing necessary changes to the plan.
- Follow the plan.
- Final evaluation of the plan's efficiency.

PERIODISATION MODELS

The different periodisation models adapt to the needs of the athletes and the sports. Their organisation is very similar but there are fundamental differences in their distribution of load. The two models that can most commonly be differentiated are:

- Traditional models which are based on the periodisation theory of Matveyev (1965, 1991). They use a simple wave-like programming of regular loads, and training periods typically structured as:
 - Preparatory periods (accumulation of motor and coordinative capacities): General, Specific.
 - Competition periods (include the most important competitions).
 - Transition periods (recovery of the player's ability to adapt).
- Contemporary models which are characterised by the use of concentrated loads, proposed by Issurin and Kaverin (1985), Verchosanshy (1990), Navarro (1994), among others. Training volume and intensity are defined as function of load over a short period of time. Certain capacities and/or goals are pursued in specialised, consecutive training blocks. Mesocycles, which last 14 to 28 days, are labelled:
 - Accumulation (A) is geared towards enhancing the motor potential of the player and to create a reserve of basic qualities.
 - Transformation (T) sees the gains made in the (A) period transferred to more specifically reflect the demands of the game.
 - Realisation (R) focusses on the achievement of results where performance peaks should coincide with the most important competitions.



Contemporary models, best suit the nuances of top level tennis.

Contemporary models are those which, from our perspective, best suit the nuances of top level tennis. The "typical" work characteristics for each one of Accumulation, Transformation and Realisation mesocycles in tennis are outlined in Table 1 (Sanz and Ávila, 2005).

For top level tennis, advantages of contemporary models of periodisation over their more traditional counterparts include:

- The possibility of achieving more selective, immediate and accumulative training effects.
- Periodisation that is more flexible and accommodating of the contingencies of competition. Adjustments can be completed without greatly affecting the general plan so as to maintain control over the mesocycles.

EXAMPLE OF A MODEL FOR TOP LEVEL TENNIS

In Table 2 a model adapted from the ATR model (Porta, 2004) of Carlos Moyà is depicted. In this model, the Transformation period is divided into two mesocycles: general and specific. Here, of note is that the training cycles (ATTR) will vary in length and content depending on the stage of the season in which the players find themselves.

CONCLUSION

We would like to conclude this article by highlighting that, in our opinion, irrespective of the preferred periodisation model, contemporary or traditional, these approaches to organising training are indispensable for optimising performance and then quantifying its link to the work performed.

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MESOCYCLES	GUIDELINES
ACCUMULATION	<ul style="list-style-type: none"> • Coordination training together with strength and aerobic endurance training. • Structural strength performed at speed and with medium loads. • Extensive interval and fartlek work.
TRANSFORMATION	<ul style="list-style-type: none"> • Free or machine weight work that simulate tennis movements (speed-strength work). • Resisted speed drills (low load). • Drills focused on stroke production (execution rhythm). • Aerobic-anaerobic endurance drills with some technical and tactical load (high intensity interval training with metabolic acidosis).
REALISATION	<ul style="list-style-type: none"> • State of no fatigue to polish technique. • Anaerobic-alactic drills devoid of neural fatigue (high intensity interval training with complete recovery). • Prioritise tactical goals over technical goals. • Proprioceptive training (preventative work).

Table 1. Work completed in ATR mesocycles.

	Characteristics	Technical goals	Physical goals
ACUMULATION (A)	Low intensity and high volume	Basic and stationary strokes Footwork with no displacement	Accumulation Endurance
GENERAL TRANSFORMATION (T)	Volume decreases and intensity increases	Footwork with displacement Special strokes Commence tactical work Situations of attack-defense Matches	Progressively more neuromuscular orientation
SPECIFIC TRANSFORMATION (T)	Tries to achieve the best form	Tactical work Patterns High number of matches	Avoid accumulation of fatigue at the end of the training period
REALISATION (R)	Competition	Refinement of strokes Tactical adjustments Match preparation	Recovery Neural work

Table 2. Adaptation to tennis of the ATR model (Porta, 2004).

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Periodisation for Professional Female Tennis Players

By Steven Martens (Davis Cup Captain, Belgium) and Carl Maes (Fed Cup Captain, Belgium)

INTRODUCTION

The different articles in this issue of ITF Coaching & Sport Science Review have highlighted the uniqueness of tennis with respect to periodisation. Tennis is markedly different to swimming or track and field for example, which allow for precise

periodisation plans. In tennis, it is almost impossible to plan for peak performance. The difficulties pertaining to periodisation are magnified in the professional game as players commit to play a minimum number of tournaments, across five continents.

In the female professional game, the current ranking system encourages players to play more tournaments. As a result, many players compromise their physical condition, recovery or overall preparation. In the past, rankings were determined across an average number of tournaments and players could

prepare more comprehensively or rest after injury. Tournament directors however, were dissatisfied because top players did not play enough. The ranking system changed and players now appear to play too much and practice too little. In an effort to better prepare and practice, players could choose to play less, but most do not. This gives rise to the following question: "Are the growing number of injuries in modern-day professional tennis due to overplay or undertraining?"

Other factors also complicate the periodisation process. Thirty weeks on the road means 30 different venues, continuous travel, changing time zones, hotels, different food, court surfaces, and weather conditions. Closer inspection of the ranking system, the rules and gender differences is needed to make sure that we do not superimpose male schedules on female players and that we do not enforce adult schedules on young players.

SPECIFIC DEMANDS OF WOMEN'S TENNIS

As the female game continues to evolve, the differences between it and the male game appear more marked. In turn, these differences have an effect on match tactics and strategy as well as periodisation for female players.

Largely as a result of their early physical maturation, young girls are beginning to play the same game as their more senior counterparts. On the boys side however, there remains a clear difference between juniors and seniors, and even between the different junior age groups. Consequently, the number of youngsters on the female professional tour appears to be increasing.

Socially and psychologically, studies conclude that women are more mature than men at younger ages. They've also been shown to be more individualistic yet more dependant, but also better organised. Duda (1992) found that males prefer competitive situations, due to their stronger ego-oriented goals, whereas females prefer performance situations, due to their preference for task-oriented goals. Empirically, it's also been noted that female players enjoy more attention and care on a personal-social level so the presence of significant others can become very important. More often than not, females view their peers or competitors on the tour as rivals as opposed to colleagues.

Collectively, these factors can have a significant impact upon a player's periodisation and the coach-player dynamic.

PERIODISATION FOR FEMALE PROFESSIONAL PLAYERS: RECOMMENDATIONS

Number of tournaments in a row vs. Time off (training period and/or recovery period)

Several experts (ECS, 2004) have suggested the planning of a minimum number of training blocks (Table 1) depending on the age of the player. Research has shown that almost 50% of the top 100 ITF ranked junior girls fail to plan the 1 block of 8 weeks and 1 block of 4 weeks (Raabe & Verbeek, 2004).

Table 2 illustrates that the top 30 ranked ITF girls play a similar number of tournaments as the top 30 ranked WTA players, yet quite a few more matches!! Compared to the professional men, these girls play a fewer number of tournaments but, again, more matches... The vagaries (ie. draw sizes and playing depth) of the junior vs professional, and male vs female tours may account for some of these differences.

These experts also recommend a specific number of consecutive tournament weeks. A maximum of 3 tournaments in a row is recommended, with 4 (once) being exceptional, and 5 being unacceptable. The calendar shows that in 2004 there are 38 series of 5 (or 6) consecutive tournament (weeks).

Age Eligibility Rule. Combined senior and junior programmes

In the authors' opinion there is a clear need for the WTA Age Eligibility Rule (AER) (WTA, 2005) to be linked to the number of junior tournaments. Ten years after its introduction, the AER has produced a significant decrease in burn-out and helped to lengthen

the average player's career. The player's stressors have shifted from being external factors beyond their control (media, parents...) to more performance based variables (injuries, travelling, etc...).

The change in the ranking system, where players are now encouraged to accumulate points has negatively affected the AER (Table 3). From 1994 onwards, the average number of tournaments players have participated in has increased and as a result the AER has been modified on several occasions. With the girls competing simultaneously at senior and junior level, the need for a combined rule seems obvious.

The numbers in Table 2 only relate to singles matches. If you bear in mind that the junior game promotes doubles play as it calculates a combined singles and doubles ranking, these results become even more significant. With failure to qualify for a US \$10,000 tournament not considered one of a player's total number of allowed tournaments, these results can become further clouded.

Limiting tournaments or mandate rest blocks

Even at the senior level, the number of tournaments in which players compete is too high for them to enjoy a well-balanced sporting life and lengthy career. Limiting the number of tournaments which young players and WTA competitors can play would have multiple benefits. The ranking would become increasingly based on quality of performance, deterring players from making countless tournament entries, and assisting

Age	First (important)	Second block	Third block
14	8 weeks	6 weeks	4 weeks
16	8 weeks	4 weeks	4 weeks
18	8 weeks	4 weeks	

Table 1. Recommended training blocks per age group.

	ATP 2004		WTA 2004		ITF 2004				
	Avg tourn	Avg match	Avg tourn	Avg match	Avg age	Avg WTA/ITF	Avg ITF jnrs	Avg total	Avg match
1>10	20.7	67.7	16.6	60.7	16.0	8.6	11.1	19.7	73.9
11>20	27.0	64.3	22.9	63.7	15.8	5.8	13.6	19.4	66.1
21>30	27.3	62.9	19.9	49.3	16.5	7.4	13.2	20.6	60.6
31>40	24.1	54.1	24.9	56.6	16.6	7.0	11.2	18.2	53.7
41>50	27.1	56.7	23.9	53.9	16.0	8.9	12.1	21.0	64.6
51>60	22.2	45.3	23.4	55.1	16.4	5.8	13.1	18.9	52.3
61>70	23.5	48.7	25.2	54	16.2	5.7	13.2	18.9	45.9
71>80	25.1	47.6	20.8	53.8	16.0	5.2	11.2	16.4	43.6
81>90	27.1	54.3	22.8	50.8	16.4	5.9	12.1	18.0	52.5
91>100	24.0	49.0	23.2	54.4	16.3	4.0	16.8	20.8	42.7
1>100	24.9	55.0	22.4	55.3	16.2	6.4	12.8	19.2	55.5

Table 2. Average number of tournaments/ matches in 2004 for top 100 ATP, WTA, ITF girls.

	WTA 94	WTA 97	WTA 2001	WTA 2004
	Avg Tourn	All Tourn	Best 18 Tourn	Best 17 Tourn
1>10	15.8	21.0	17.4	16.6
11>20	16.5	23.3	24.3	22.9
21>30	15.9	20.3	23.6	19.9
31>40	17.1	21.6	23.1	24.9
41>50	17.0	23.9	24.0	23.9
51>60	17.6	21.8	24.7	23.4
61>70	15.4	19.7	25.0	25.2
71>80	15.1	24.1	21.3	20.8
81>90	13.5	20.9	22.2	22.8
91>100	15.3	10.7	23.9	23.2
1>100	15.9	21.8	23.0	22.4

Table 3. The affect of changing ranking system on number of tournaments played.

in establishing a more even playing field characterised by more open draws. Unfortunately this is a hard sell as limiting the number of tournaments would basically mean a loss of potential income for the self-employed players.

Another option could be making it compulsory for the players to stay off the tour for a minimum number of weeks or for at least two blocks (of 'x' weeks) per year. The economic reality of this option however, is that both agents and players would likely organise some lucrative exhibitions instead.



The selection of tournaments plays an important role in the periodisation process.

PERIODISATION MODELS

Balyi (2003) stresses the importance of periodisation to avoid situations in which players feel the need to compete a lot to improve their rankings but are unable to compete enough because they do not take the necessary time to train properly. In imploring coaches to be concerned with the well being of the athlete, Balyi considers tennis a late specialisation sport (which could be debated) consisting of 4 stages.

Maes (2003) suggests working in cycles of 3 weeks on the road vs. 3 weeks off the road and a minimum of 1 larger 6-8 week training block. Week 1 of the off the road cycle would be of low volume and focus on the less used and more technical strokes/factors. Week 2 would see the training volume and intensity increase, while week 3 would be characterised by less voluminous, very specific explosive workouts with a tactical emphasis on strengths rather than weaknesses. The most underrated phase from a physical and mental perspective is the transition/recovery phase.

The WTA (2001) recommends the scheduling

of preparation (minimum: 4 weeks), pre-competition (minimum: 4 weeks), peaking (maximum: 3 weeks), and active rest phases (1-4 weeks) several times throughout the calendar year. However, against the backdrop of the current ranking system, these blocks appear too long, and we recommend keeping the order but varying the length (shorter during the in-season and 1 (or 2) bigger preparation and pre-competitive phases per year).

From a technological perspective, computer programmes such as "Digitaltenniscoach" and "Dagenda" provide some planning and periodisation guidance and can serve as an effective means of streamlining coach-athlete communication.

CONCLUSION

The performance of tennis players is difficult to periodise and it becomes increasingly so, with women (or girls) that compete at the senior level at very young ages. If coaches, trainers, parents and agents cannot protect the young women from overplaying and overtraining then both the tournament regulations and the training systems need to be reviewed.

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Recommended Books and Videos

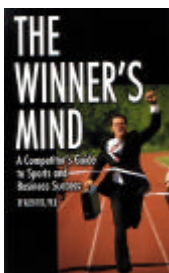
BOOKS

The Winner's Mind. A Competitor's Guide to Sports and Business Success.

Author: Allen Fox. Year: 2005 Language: English Level: All levels ISBN: 0-9722759-2-4

In addition to sharing his experiences as a world-class tennis player and successful businessman, Allen Fox unveils the success strategies of champions and reveals how anyone can use them to tilt the odds in their favour on and off the court. Fox describes the common psychological characteristics of winners as well as some of the obstacles that one may encounter during the path to victory. This book will help coaches and players understand the skills required to be successful and supply you with the knowledge required to achieve your goals.

For more information contact: www.racquetTECH.com



teenage players, and for the players as well. It is not specific to tennis but rather the author has written from his experiences as a professional tennis player, parent, teacher, counsellor and social worker to create a book that is easy to read and gives a great insight into the mind of teenagers. The book also contains some excellent quotes and tips for teenagers such as "We tend to become the type of person with whom we associate. Do your utmost to choose your friends wisely".

For more information contact: www.torchlight.com

Le Tennis en Fauteuil Roulant (Wheelchair Tennis).

Author: Fédération Française de Tennis

Year: 2002 Language: French Level: All levels ISBN: 2-907267-86-8

An excellent resource for any coach working with a wheelchair tennis player or for coaches wishing to see what type of drills can be created with a little imagination. This book covers all the aspects of wheelchair tennis play from the basics of gripping the racket correctly to advanced physical / mobility training. Containing many appropriate high quality colour diagrams of mobility and tactical drills for the 5



different game situations this book is definitely worth reading.

For more information contact: www.fft.fr

Tenis: Espacio, Tiempo y Números (Tennis: Space, Time and Numbers).

Author: Fernando Segal Year: 2003 Language: Spanish

Level: All Levels ISBN: 987-43-6841-1



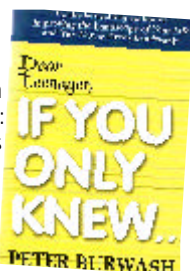
One of the most comprehensive tennis books published, discussing: the benefits of being a complete player, the philosophy of playing tennis, the different methodologies associated with teaching and analysing tennis, and the different game situations. In addition to providing the theory about what and how to train for tennis, the book contains more than 250 different on court exercises. The exercises are grouped according to the playing situation and contain at least 2 diagrams and at least 2 ways in which the drill can be progressed. A great resource for coaches wanting to learn new and effective exercises.

For more information contact: destino@sinectics.com.ar

Dear Teenager, If You Only Knew...

Author: Peter Burwash Year: 2000 Language: English Level: All levels ISBN: 1-887089-20-9

This book is a must read for coaches who are working with



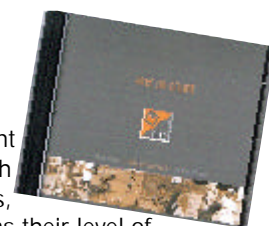
CD

Art of Tennis: Kids on court Volume 1

Author: Jurgen Muller and Oliver Heuft Year: 2003 Language: English and German Level: All levels

This CD will provide all coaches with some thought provoking material. It contains many different activities that can be performed with kids as well as the scientific reasoning for performing such activities. Furthermore, it demonstrates how the use of different teaching aids such as skipping ropes, modified tennis balls, basketballs etc., can be used to enhance the learning process of kids as well as their level of enjoyment. A very good resource for coaches working with kids who want to enhance the learning process of their players and have some fun in the process.

For more information contact: www.art-of-tennis.com



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