



# ITF Coaches Education Programme

Coaching High Performance Players Course

## *The Mechanics of Net Play*

By Machar Reid & Miguel Crespo



# ***The Role of Anticipation***

Poor preparation → rushed stroke → poor mechanics.

Experienced players → ↑ anticipation → ↑ time

Important cues to facilitate anticipation:

- Opponent's patterns and tendencies
- Cues from strokes
- Court positioning
- Perception of spin and trajectory.



# ***Finding the Time!***

**Response time** = reaction time and movement time.

**Reaction time** = time to process information and send appropriate message to muscles.

**Movement time** = time spent moving into position for the correct volley.

**Average reaction times\*\***

**226 ms (forehand volley)**

**205 ms (backhand volley).**

(Chow et al, 1999)



## *Footwork – Split Step*

**1. Balance**

**2. Pre-stretch**

**- store elastic energy, overcome inertia and shorter response time.**

**Top players – Just after opponent's impact**

**Lower level players – Initiation of opponent's forward swing**

*Pro*Compare



Copyright © Procompare, 2003. All rights reserved. [www.procomparetennis.com](http://www.procomparetennis.com)



# Preparation

## Grip

*Continental or Eastern*

*Schonborn (1998) – Time available for grip change*

## Determined by:

- Anticipation
- Reaction time
- Forearm strength
- Support of other hand
- Height of contact point
- Footwork
- Shot intention

(World Class Tennis Technique, 2001)



# *The Importance of Weight Transfer*

## Low ball velocity

Lateral movement through sideways lean

NOTE:

- Weight transfer not to be completed before impact
- Hands and feet should not be synchronized for impact

## High ball velocity

Vigorous push-off with contralateral foot

*When is the weight transfer step is completed?*

## Lower volleys

Before contact

## Higher volleys

After contact

(Chow et al., 1999; Williams, 2000)





***Foot-ground contact?***







# ***Backswing***

Racket rotated beyond service line by\*\*:  
 $\approx 25^\circ$  (forehand)

\*\* Largely dependent on circumstance

(Elliott et al., 1988)



Copyright ProCompare 2003. All rights reserved. www.procomparetennis.com



# *Backswing*



Racket rotated beyond service line by\*\*:

$\approx 45^\circ$  (backhand)

\*\* Largely dependent on circumstance

(Elliott et al., 1988)



ProCompare



# Circumstance

Beyond shoulder when played from service line

•1st volleys (depth)



Copyright © ProCompare, 2004. All rights reserved. www.procomparetennis.com

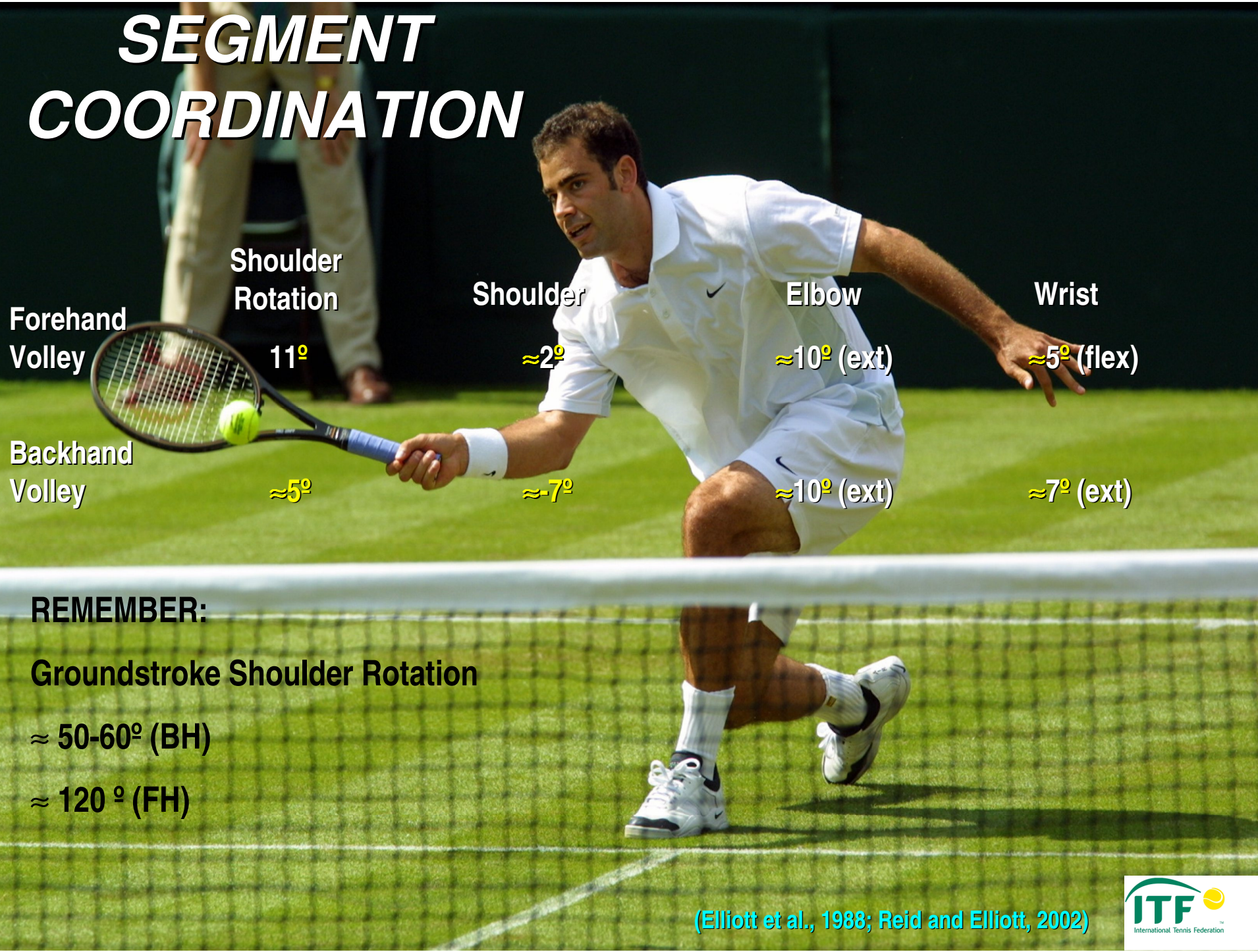
## Abbreviated swing

•2<sup>nd</sup>/punch volleys (angle)





# SEGMENT COORDINATION



Forehand Volley	Shoulder Rotation $11^{\circ}$	Shoulder $\approx 2^{\circ}$	Elbow $\approx 10^{\circ}$ (ext)	Wrist $\approx 5^{\circ}$ (flex)
Backhand Volley	$\approx 5^{\circ}$	$\approx 7^{\circ}$	$\approx 10^{\circ}$ (ext)	$\approx 7^{\circ}$ (ext)

## REMEMBER:

### Groundstroke Shoulder Rotation

$\approx 50\text{-}60^{\circ}$  (BH)

$\approx 120^{\circ}$  (FH)

(Elliott et al., 1988; Reid and Elliott, 2002)



**Initial weight transfer**

**(Soleus, gastrocnemius, quadriceps and gluteals)**

**Trunk rotation**

**(Obliques and spinal erectors)**

**Forehand volley**

**(Anterior deltoid, pectorals, shoulder internal rotators, elbow flexors (biceps) and serratus anterior muscles)**

**Backhand volley**

**(Rhomboids, middle trapezius, posterior deltoid, middle deltoid, shoulder external rotators, triceps and serratus anterior)**

**(Roetert & Ellenbecker, 1998)**



ProCompare

**REMEMBER:**

***Velocity Generation or  
Precision?***



Copyright © ProCompare, 2004. All rights reserved. [www.procomparetennis.com](http://www.procomparetennis.com)

***Different volleys do  
demand different  
segment coordination!***





**HOWEVER:**

***Drive Volley –  
Velocity Generation  
or  
Precision?***





# ***Impact***

*Forward of hitting shoulder*

*Open racket face (w. high-to-low trajectory)*



*↑ Backspin and control*



(Elliott et al., 1988)



# ***Racket and Ball Interaction***

## **Increase in Ball Velocity (post impact)**

**Forehand volley (120%)**

**Backhand volley (116%)**

**Groundstrokes (400%)**

## **Racket Velocity (post impact)**

	Reasonable Volleyers	Excellent Volleyers
Forehand Volley	50%	90%
Backhand Volley	45%	75%

(Elliott et al., 1988)



# Follow-Through

## Two distinct paths:

- Racket head moves forward and down before moving to ready position



- Racket 'dishes' with racket face opening up and moving "backwards" and down



(Elliott et al., 1988)



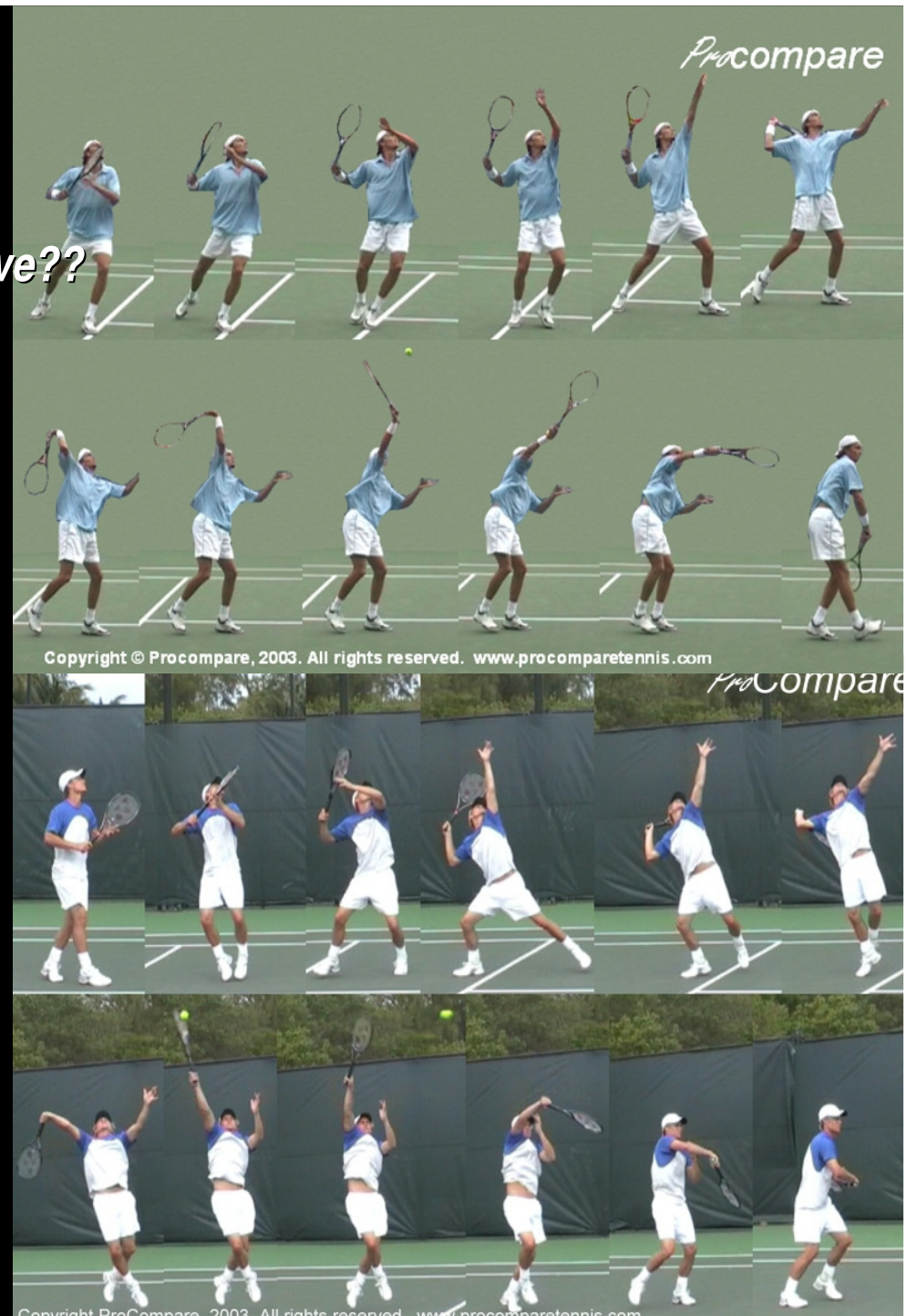
# Smash

*Paucity of research*

*Application of information learned from serve??*

*Tokuda et al., 1995*

- *Elbow flexion in backswing*
- *Proximal-to-distal sequencing*
- *Upward swing path 4°*







***Thank you***

***Any questions?***