

BIOMECHANICS for Stroke Production

Phase of Stroke	Forehand	One-Handed Backhand	Two-Handed Backhand	Volley	Serve
Preparation	• Lower limb loading and hip rotation	• Lower limb loading and hip rotation	• Lower limb loading and hip rotation	• Lower limb loading and hip rotation	• Grip
	• Trunk rotation	• Trunk rotation	• Trunk rotation	• Trunk rotation	• Stance type
	• Shoulder-upper arm rotation (transverse plane)	• Shoulder-upper arm rotation (transverse plane)	• Shoulder-upper arm rotations (transverse plane) of the dominant arm	• Shoulder-upper arm rotation (transverse plane) for forehand volley	• Leg flexion
	Use of the non dominant hand				• Shoulder and hip rotations
			• Shoulder-upper arm rotations (transverse plane) of the non-dominant arm	• Shoulder-upper arm rotation (transverse plane) for single-handed backhand volley	• Ball toss
Acceleration / Contact	• Lower body drive and hip rotation	• Lower body drive and hip rotation	• Lower body drive and hip rotation	• Lower limb drive and hip rotation	• Leg drive
	• Trunk rotation	• Trunk rotation	• Trunk rotation	• Trunk rotation (minimal)	• Trunk rotations (forward and shoulder-over-shoulder)
	• Upper arm horizontal movement (4 ball contact)	• Upper arm abduction and horizontal extension (4 ball contact)	• Upper arm abduction and horizontal extension (4 ball contact)	• Upper arm horizontal movement and elbow extension	• Position at maximum external rotation of the upper arm
	balance- footwork foundation	• Elbow extension	• Upper arm adduction and horizontal flexion	• Wrist movement (extension/abduction)	• Movement of non-racquet arm
	• Forearm pronation	• Wrist extension and adduction	• Elbow flexion		• Shoulder internal rotation
	• Elbow extension/flexion		• Wrist extension and adduction		• Forearm pronation
	• Upper arm internal rotation		• Wrist flexion and hand abduction		• Wrist flexion
	• Hand flexion (forward)/ Hand flexion (sidewards – toward little finger)				• Kinematic chain
					• Impact position: Height of impact – off the ground - Position of ball re the front foot - Angle between trunk and upper arm (+- 100) - Trajectory of racquet and ball
Follow-through	• Lower body / balance	• Lower body	• Lower body	• Lower body	• Shoulder internal rotation
	• Trunk rotation / hip direction	• Trunk rotation	• Trunk rotation	• Trunk rotation	• Path of racquet
	• Deceleration of upper arm /racquet	• Deceleration of upper arm/racquet	• Deceleration of upper arm/racquet	• Deceleration of upper arm/racquet	• Landing foot/balance