

PHILIPP H. HALFMANN'S

BASIC INTRODUCTION TO WEIGHTLIFTING

INTRODUCING WEIGHTLIFTING

WHY WEIGHT TRAINING
DOES MAKE SENSE

KINETIC CHAIN

OPTIMIZING TRANSFER
OF ENERGY



PHILIPP HALFMANN'S

Basic Introduction to Weightlifting for Tennis

First Edition

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BASIC INTRODUCTION TO WEIGHTLIFTING FOR TENNIS

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ABOUT THE AUTHOR: PHILIPP H. HALFMANN

Congratulations and thank you for getting the first edition of „Basic Introduction to Weightlifting for Tennis“. This edition provides an overview to weightlifting for tennis including static & dynamic stretches, resistance training exercises and a comprehensive yet easy to use training program. The exercises presented here are based on my new book, Advanced Concepts of Strength & Conditioning for Tennis. Before you jump into the provided material I would like to use the opportunity to introduce myself and hope you will enjoy the read!

I was born and raised in Germany by my parents, Hubert J. Halfmann and Waltraud Halfmann, who are both pharmacist. I grew up near Dortmund, city of national soccer champion Borussia Dortmund, where my parents still live today.

I started playing tennis by age four (4) and as a teenager became one of the top juniors in the state, competing at national and international junior tournaments. Upon graduating from Freiherr-vom-Stein Gymnasium (high school) in Luenen, I entered the German Armed Forces, where I learned about discipline, team work, and sports science. After training members of my fellow company and receiving an award for being the fastest company during a 10 mile NATO cross-country race, I chose coaching as my life-long career.

In 2001, after being honorably discharged from the military, I moved to New York City to study at Bernard Baruch College and play tennis for the Bearcats, with whom I won the CUNYAC Tournament Championships twice, served as the assistant tennis coach, and graduated in 2005 with a bachelor of science degree. I went on to work as the head tennis professional at the Turnberry Isle Resort & Club in Miami, Florida, where I coached under the guidance of Australian tennis legend Fred Stolle, winner of 18 Grand Slam Championships. In 2006, I attended Florida International University (FIU), where I earned my master's degree in exercise & sports science. During my time at FIU, I became graduate assistant to 13 year NBA Head Strength & Conditioning coach Mick Smith and worked as assistant strength & conditioning coach with various NCAA Div I teams and professional athletes, such as NBA champion Antoine Walker. Starting 2010 I worked as a tennis touring coach for Swiss national Alexander Ritschard, who won the Swiss National Junior Championships 2010 & 2011 (singles & doubles), improved his world junior ranking by 600 spots within 12 month, and earned an ATP ranking at age 16 (1 out of 5 juniors worldwide in 2010).



”Thank you for your interest in my new book.
I’m looking forward to your feedback.“

In 2012 I founded the International Association for Athletic Performance & Health (IAAPH), located in Berlin, Germany.

I also serve as an expert for the German Performance & Lifestyle magazine LOOX.

I live with my wife, Sophia, in Berlin, Germany, and Miami, Florida. Outside of sports, I enjoy a wide range of music, reading, and spending time with the family.

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WHY WEIGHTLIFTING FOR TENNIS PLAYERS MAKES SENSE

There are different points of view with regards to physical conditioning for tennis players. Some people believe there should be no weightlifting involved because that makes the athlete bulky.

Others believe that a tennis player only should use light weights when working out because using heavy weights makes the athlete move slower on the court.

The Purpose of “Weightlifting” for Tennis Players

First of all, the purpose of “weightlifting” (e.g. Olympic lifts; Power Clean) is to enhance kinetic energy transfer (kinetic chain efficiency) because it reduces the risk for injury and optimizes power output since no energy is being “wasted”. Kinetic chain efficiency (explained shortly), amongst other things, can be accomplished by making the athlete very balanced with their strength so that the joints function properly, which can be accomplished by enhancing range of motion (ROM)/flexibility. Take for example the “house building” analogy: A house will become a sound structure if the walls and beams (connecting points) are strong enough to support the weight of the roof, otherwise the house collapses, no matter how thick (strong) the walls are going to be. During body building one isolates certain muscle groups and makes them stronger like the walls in the house but the supporting musculature surrounding the joint (like the beams in the house) remain “weak” because machines stabilize the action during “body building”. On the other hand during Olympic lifts (e.g. Hang Snatch) the athlete needs to stabilize everything without the help of any external object, which means that the surrounding musculature (e.g. stabilizers) will also become stronger like the beams in the „house building” analogy.

In other words, weightlifting is not body building. For example, the athlete can use free-weight exercises (e.g. Front Squat), where the athlete’s body needs to stabilize the action, which emulates the physical demands required during a tennis match (the athlete needs to stabilize his/her body during stroke production). On the other hand, body building often involves machine-based training where muscle groups are being isolated and stabilization occurs via the machine. Therefore, weight lifting is beneficial to a tennis player whereas body building is not.

So, the goal is to make the athletes very balanced (muscle balanced) with their strength and increase range of motion so that the joints function properly. Then you apply everything else. **Most coaches just want to focus on resistance or speed but if one makes something faster or one makes something stronger but it’s already imbalanced then one will increase the imbalance, which will then commonly lead to injury and hence the coach did nothing that was beneficial.** In other words, the training program was ineffective and the coach wasted the athlete’s time...this is the most common error committed by coaches!



Optimizing Kinetic Chain - And Transfer of Energy Efficiency

Now, according to Newton's 2nd law of motion, which describes the relationship between a force acting upon a body (object) and the motion that body (object) experiences due to that force, a force (F) can be expressed as mass (m) of an object times its acceleration (a) or $F = m * a$.

With regards to exercise, a force can be thought of as a muscular pushing or pulling action that controls movement, causes movement, or inhibits movement of the entire body or a body segment. In order to exert force, muscles require energy and efficient transfer of energy is required in order to transfer the maximum amount of force. Since power can be expressed as force x distance over time (power = force x distance/time), efficient force transfer, and hence energy transfer, will have a positive effect on maximum power output. Therefore, optimizing energy transfer is crucial for optimizing overall performance on the court and energy transfer can be enhanced by Olympic Power Lifts or using free-weight exercises since they enhance stabilizer capabilities, which means less energy is "lost".

Now, according to the aforementioned, how can one become powerful if the mass of the object being used is light?

Does that mean one needs to lift super heavy weights (e.g. squat 400 lbs)?

No. The purpose is to enhance athletic conditioning. It means that one needs to optimize athletic capabilities so that the tennis player can perform well on the court, which implies that managing one's body becomes more important than the total amount of weight being lifted.



TRAINING PLAN: NO PAIN, NO GAIN!

Following you will find a sample training plan, which can be used to get familiar with various resistance training exercises, reduce muscular imbalances and build muscle mass. The plan consists of static & dynamic stretching exercises and 3 different resistance training workouts for upper-body, lower-body and total-body, respectively. Generally it is recommended to perform dynamic stretches before and static stretches after the workout session.

With regards to training frequency it is suggested to take a day off in between workout bouts but you also have the option to tailor the plan to your personal needs. For example, you could decide to do upper-body on Tuesdays, followed by lower-body on Wednesdays, take Thursdays off, and finish the week with a total-body workout on Fridays.

For ideal results a proper nutritional strategy should complement the training plan. If training intensities are unknown (% of 1 repetition maximum; 1RM) then use as much weight until you feel light muscle “pain” by the 10th repetition.

Equipment	
Most gyms (e.g. Bally Total Fitness, Equinox) will provide all the necessary equipment (e.g. machines) to perform the provided exercises. Apart from the machines we have provided an equipment list for your convenience:	
Barbell (BB)	1
Dumbbell (DB)	2 (or more as needed)
Weight Plates	2 (or more as needed)
Physio Ball (PB)	1
Safety Clips	2

Recommended Weekly Schedule							
	MON	THU	WED	TUE	FRI	SAT	SUN
Upper-Body	x						
Lower-Body			x				
Total-Body					x		

DYNAMIC STRETCHING: PRE-WORKOUT

Sub-Category:	Total-body		
Exercise	Sets	Reps	Duration (in sec.)
High Knee Pulls	1	4/leg	24
Buttocks Kicks	1	10/leg	40
Straight Leg Kicks	1	4/leg	24
Piriformis	1	4/leg	24
Lateral Squat to Overhead Reach	1	4/leg	24
Forward Lunge to Ankle Reach	1	4/leg	24
Shoulder Rotation	1	10	20
Total:	9	76	3:00 min

The dynamic stretching routine warms-up the major muscle groups in order to decrease the risk for injury and enhance the musculature's power producing capabilities.

Keep in mind that in order to maximize training results and efficiency it is extremely important to perform the above mentioned exercises with **absolute precision** rather than speed.

If you are unfamiliar with how to properly perform the presented exercises or want to have more background information on how stretching and weightlifting minimize the risk of injuries, increase your range of motion and therefore enhance your power potential and ultimately your overall on-court performance, ask your personal trainer or buy a good book. We recommend „**Advanced Concepts of Strength & Conditioning for Tennis**“ by the same author.

Advanced Concepts of Strength & Conditioning for Tennis

Paperback: 738 pages (hardcover)

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More info at <http://www.tennis-conditioning-book.com>



HIGH KNEE PULL

SUMMARY

The High Knee Pull is a dynamic stretching exercise for the lower-body, which focuses on reducing the risk of injury, optimizing power-production capabilities, improving flexibility utilizing no equipment.

PURPOSE

1. Reducing the risk of injury
2. Optimizing power-production capabilities of musculature
3. Improving flexibility

RECOMMENDED RESISTANCE TRAINING EXERCISES

1. Squat
2. Front Squat
3. Deadlift

RELEVANCE

- Warms-up musculature of lower extremities used during running & jumping activities
- If “Thomas Test” shows deficiency, implement this exercise into the warm-up routine
- If “Thomas Test” shows deficiency, implement the “Recommended Resistance Training Exercises” into the gym workout routine

DESCRIPTION

1. Take a step and raise the left knee towards the chest
2. Grab your leg with both hands just below the knee
3. Pull knee as close to your chest as possible
4. Hold the knee for 1 second
5. Release the left knee
6. Take a step and raise the right knee and repeat

TARGETED MUSCULATURE

1. Glutes
2. Hip Flexors (iliopsoas)
3. Hip Adductors



FORWARD LUNGE & ANKLE REACH

SUMMARY

The Forward Lunge & Ankle Reach is a dynamic stretching exercise, which focuses on reducing the risk of injury, optimizing power-production capabilities, improving flexibility and stability utilizing no equipment.

PURPOSE

1. Reducing the risk of injury
2. Optimizing power-production capabilities of musculature
3. Improving flexibility
4. Improving Stability

DESCRIPTION

1. Look forward at all times
2. Take a large step out with the left leg
3. Drop right knee towards the ground in a controlled fashion until both knees are at 90°
4. Rotate the torso all the way to the right and touch/reach the ankle of the right foot
5. Keep weight on forward heel
6. Stand up and progress into next lunge now rotating and touching towards the left side

RECOMMENDED RESISTANCE TRAINING EXERCISES

1. Russian Twist
2. MB Trunk Rotation Throws
3. Lunge (forward/reverse/lateral)

PRE-REQUISITE EXERCISES

- Forward/Reverse Lunge
- Lunge & Twist

RECOMMENDED RESISTANCE TRAINING EXERCISES

- Russian Twist
- MB Trunk Rotation Throws
- Lunge (forward/reverse/lateral)

DEGREE OF DIFFICULTY

- 3

RELEVANCE

- Warms-up musculature of lower extremities and trunk used during groundstrokes
- If “Trunk Rotator Test” shows deficiency, implement this exercise into the warm-up routine
- If “Hip Flexor/Trunk Extension” shows deficiency, implement the “Recommended Resistance Training Exercises” into the gym workout routine

TARGETED MUSCULATURE

1. Glutes
2. Quadriceps
3. Hamstrings
4. Hip Flexors
5. Obliques



PIRIFORMIS STRETCH

SUMMARY

The Piriformis Stretch is a dynamic stretching exercise, which focuses on reducing the risk of injury, optimizing power-production capabilities, and improving flexibility utilizing no equipment.

PURPOSE

1. Reducing the risk of injury
2. Optimizing power-production capabilities of musculature
3. Improving flexibility

RECOMMENDED RESISTANCE TRAINING EXERCISES

1. Lateral Lunge
2. Lateral Squat

DESCRIPTION

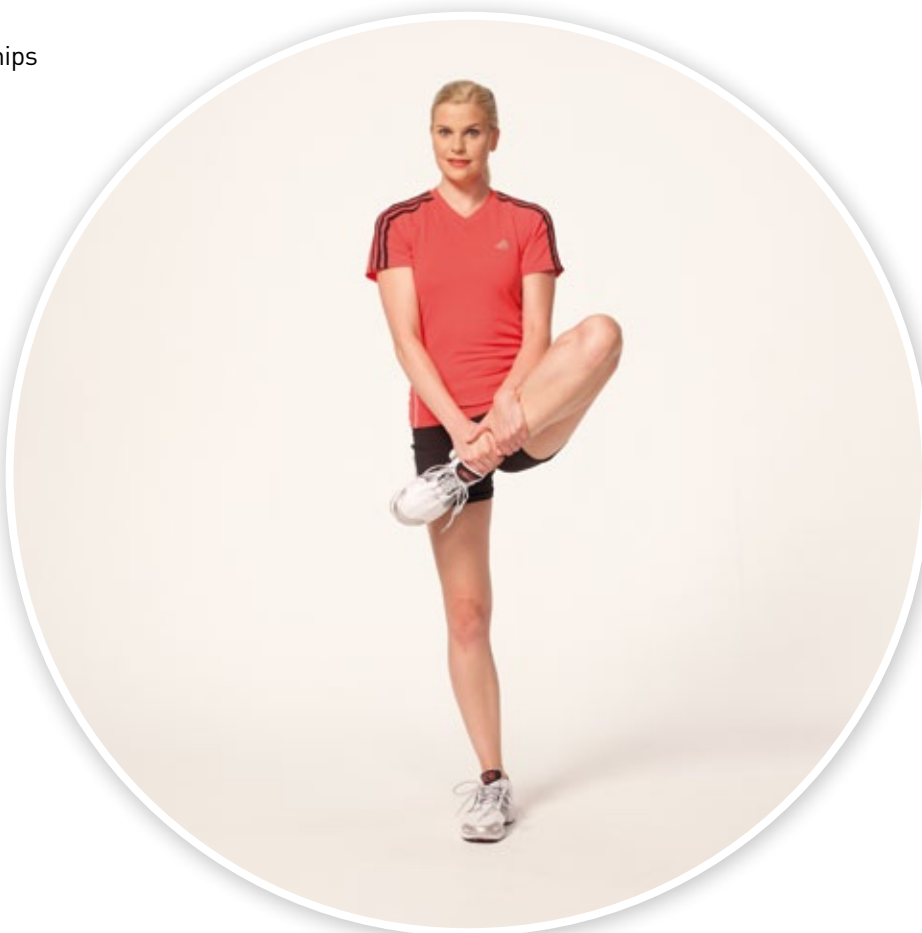
1. Face forward
2. Stand on the left leg
3. Move the right leg and bend the knee so that the toes point inside and the knee outside
4. Grab the right shin with both hands
5. Pull lower right leg up towards your hips
6. Hold stretch for 1 second
7. Release right leg, take a step, and repeat with left leg

RELEVANCE

- Warms-up musculature of lower extremities used during lateral movement/change of direction
- If “Stability Pad Squad Test” shows deficiency, implement this exercise into the warm-up routine
- If “Bilateral Lunge Test” shows deficiency, implement the “Recommended Resistance Training Exercises” into the gym workout routine

TARGETED MUSCULATURE

1. Piriformis



STATIC STRETCHING: POST-WORKOUT

Sub-Category: Upper-body			
Exercise	Sets	Reps	Duration (in sec.)
Anterior Deltoid	1	1	45
Posterior Deltoid	1	1	45
Single Arm Pectoralis	1	1	45
Wrist Flexor	1	1	45
Wrist Extensor	1	1	45
Overhead Triceps	1	1	45
Total:	7	7	5:15 min

Sub-Category: Lower-body			
Exercise	Sets	Reps	Duration (in sec.)
Supine Knee to Chest	1	1	45
Side-lying Quad	1	1	45
Seated Piriformis	1	1	45
Butterfly	1	1	45
Lunge Hip Flexor	1	1	45
Standing Calve	1	1	45
Total:	7	7	5:15 min

We recommend performing the static stretching routine after each workout session as it improves range of motion (ROM) and reduces delayed onset of muscle soreness (DOMS) significantly, which allows you to train the next day.

Keep in mind that in order to maximize training results and efficiency it is extremely important to perform the above mentioned exercises with **absolute precision** rather than speed.

If you are unfamiliar with how to properly perform the presented exercises or want to have more background information on how stretching and weightlifting minimize the risk of injuries, increase your range of motion and therefore enhance your power potential and ultimately your overall on-court performance, ask your personal trainer or buy a good book. We recommend „Advanced Concepts of Strength & Conditioning for Tennis“ by the same author.

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WRIST FLEXOR

SUMMARY

The Wrist Flexor is a static stretching exercise, which focuses on improving flexibility of the wrist flexor musculature, reducing the risk of injury and aids in the muscle recovery process.

PURPOSE

1. Improving flexibility of wrist flexor musculature
2. Reducing the risk of injury
3. Aiding muscle recovery process

DESCRIPTION

1. Flex shoulder to 90°, extend the elbow, externally rotate the arm, and extend the wrist; fingers point outward
2. Grab fingers with the other hand and pull towards the shoulder

COMMON ERRORS

- Pulling on the palm of the hand

RECOMMENDED EXERCISES

- Hang Clean

RELEVANCE

- Reduces delayed onset of muscle soreness of wrist flexor musculature

KEY FACTORS

- Pull on the fingers
- Hold stretch for 45 seconds

TARGETED MUSCULATURE

- Flexor Carpi Radialis
- Flexor Carpi Ulnaris
- Flexor Digitorum Superficialis & Profundus
- Flexor Pollicis Longus



LUNGE HIP FLEXOR

SUMMARY

The Lunge Hip Flexor is a static stretching exercise, which focuses on improving flexibility of hip flexor musculature, reducing the risk of injury and aids in the muscle recovery process.

DESCRIPTION

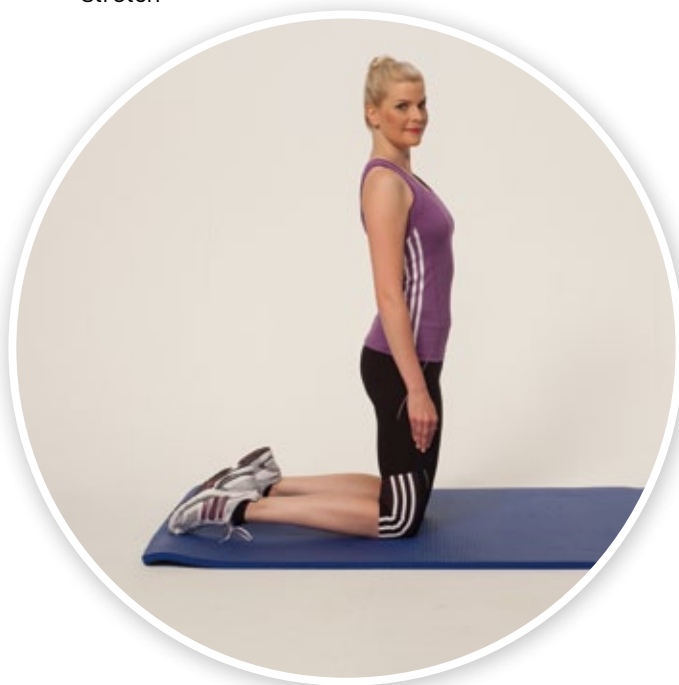
1. Place floor mat on the ground
2. Step into a forward lunge position; the knee of the rear foot has ground contact; knee of the front foot is flexed at 90° and doesn't protrude past toes
3. Reposition the front foot forward until rear leg/hip is hyper-extended; maintain neutral spine and head position (straight back; look forward)

Note:

1. If contralateral (opposite) elbow touches the lateral aspect of the forward knee, **obliques** will also be stretched

COMMON ERRORS

- Leaning forward with upper body and pushing knee past the toes
- Flexion of cervical spine (head flexion) during stretch



PURPOSE

1. Improving flexibility of hip flexor musculature
2. Reducing the risk of injury
3. Aiding muscle recovery process

REQUIRED EQUIPMENT

- 1 Floor Mat

RELEVANCE

- Reduces delayed onset of muscle soreness of hip flexor musculature

KEY FACTORS

- Knee doesn't protrude past the toes
- Maintain neutral spine and head position
- Hold stretch for 45 seconds

TARGETED MUSCULATURE

1. Hip Flexors (iliopsoas, rectus femoris, sartorius, gluteus minimus)
2. Obliques (if applicable)



1

SIDE-LYING QUAD

SUMMARY

The Side-Lying Quad is a static stretching exercise, which focuses on improving flexibility of knee extensors (and hip flexors if applicable), reducing the risk of injury and aids in the muscle recovery process.

PURPOSE

1. Improving flexibility of knee extensors (hip flexors if applicable)
2. Reducing the risk of injury
3. Aiding muscle recovery process

DESCRIPTION

1. Place floor mat on the ground
2. Lay flat on the side with legs close together; the to-be-flexed leg rests on top of the other; extend bottom arm; look forward
3. Grasp the toes of the to-be-flexed leg and pull the heel towards the gluteus (buttocks); lower leg remains straight; maintain neutral pelvic position
4. If applicable, extend hip behind the torso for an additional **hip flexor stretch**; maintain posterior pelvic position

RECOMMENDED RESISTANCE TRAINING EXERCISES

1. Butt Kicks
2. Front Squat

COMMON ERRORS

- Compromised pelvic position during stretch by focusing on hip flexors rather than quadriceps; pulling knee behind torso rather than bringing heel to buttocks
- Flexion of cervical spine (head flexion) during stretch

REQUIRED EQUIPMENT

- 1 Floor Mat

RELEVANCE

- Reduces delayed onset of muscle soreness of knee extensor (and hip flexor) musculature
- If “Knee Flexion Test” shows deficiencies, implement this exercise into post-exercise stretching routine

KEY FACTORS

- Maintain neutral pelvic position
- Maintain neutral spine and head position
- Hold stretch for 45 seconds

TARGETED MUSCULATURE

1. Quadriceps
2. Hip Flexors (iliopsoas, rectus femoris, sartorius, gluteus minimus) if applicable



RESISTANCE TRAINING: UPPER-BODY

Exercise	Sets	Reps	Intensity (% of 1 RM)	Rest (in sec.)	Duration (in min.)
Bench Press	3	12	70	90	6 ½
DB Bench Press	3	12	65	90	6 ½
Cable Flys	3	12	70	90	6 ½
Standing Military Press	3	12	70	90	6 ½
Seated DB Military Press	2	12	65	90	4
Seated Row	3	12	70	90	6 ½
Upright Row	3	12	70	90	6 ½
Bend-Over Cable Row	3	12	70	90	6 ½
BB Bicep Curl	3	12	70	90	6 ½
Tricep Pushdown	3	12	70	90	6 ½
Supine Hip Lifts	2	12	-	90	4
Russian Twist	2	12	20-45lb	90	4
Supine Toe Touches	2	12	-	90	4
Total:	35	156		19 ½ min	74 ½ min

DB = Dumbbell BB = Barbell

Be advised that proper exercise execution is more important than total amount of weight being lifted; otherwise one defeats the purpose of the exercise. For example, during the “Seated Row” one should pay attention to proper spinal alignment (sit upright) while pulling the handle in between the belly button and chest instead of initiating the exercise via hip extension (leaning back with the upper-body) before the pulling action occurs.

If you are unfamiliar with how to properly perform the presented exercises or want to have more background information on how stretching and weightlifting minimize the risk of injuries, increase your range of motion and therefore enhance your power potential and ultimately your overall on-court performance, ask your personal trainer or buy a good book. We recommend „**Advanced Concepts of Strength & Conditioning for Tennis**“ by the same author.

More info at <http://www.tennis-conditioning-book.com>

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STANDING MILITARY PRESS

SUMMARY

The Standing Military Press is a compound exercise, which focuses on improving the synergy of the neuro-muscular system, strengthening the shoulder girdle & shoulder joint and elbow extensor musculature, improving body control & coordination and flexibility as well as improving skill & balance foundation for complex movements.

Note: Exercise can also be performed with dumbbells!

PURPOSE

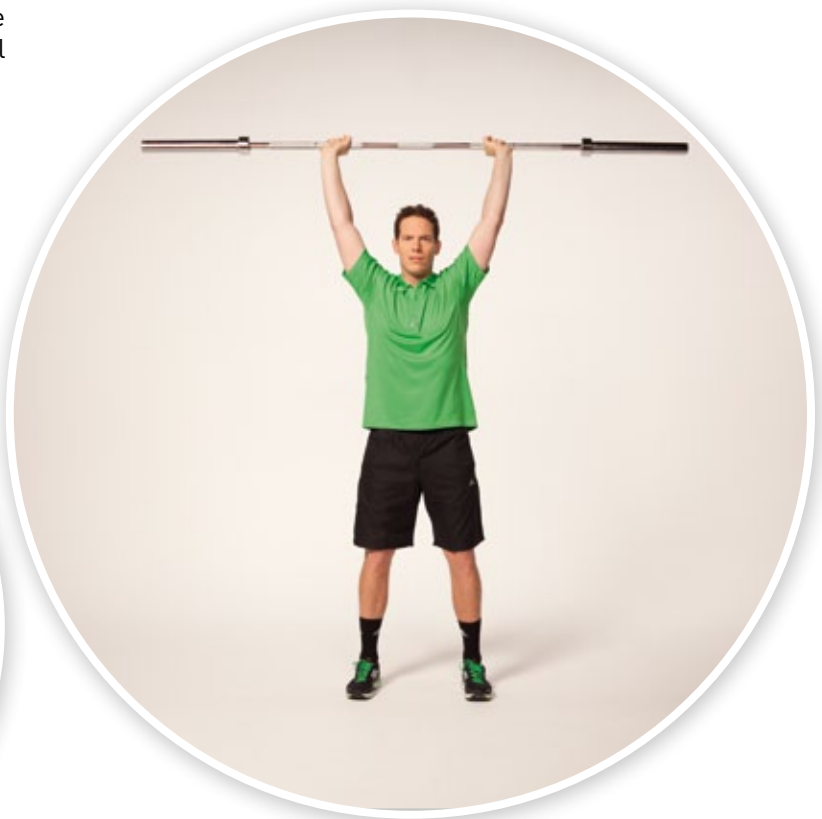
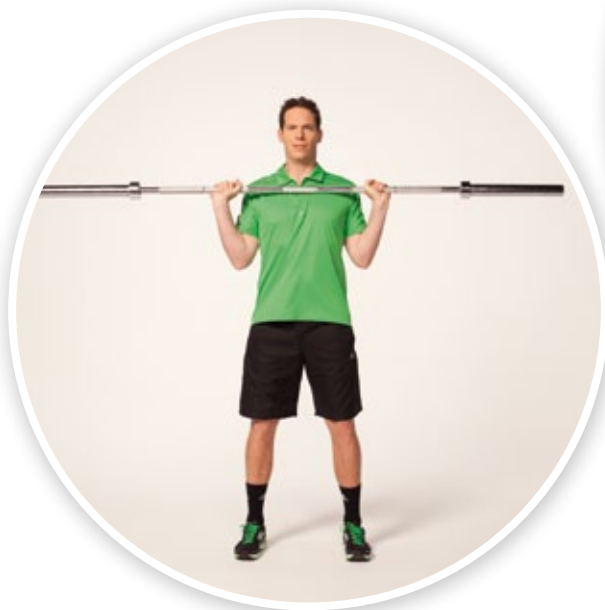
1. Improving transfer of energy; synergy of neuro-muscular system
2. Strengthening of **shoulder girdle** (trapezius) & **shoulder joint** (deltoid) & **elbow extensor** (triceps secondary) musculature
3. Improving body control & coordination by enhancing stabilizers and gliding neutralizers
4. Improving flexibility
5. Improving skill and balance foundation for complex movements

DESCRIPTION

1. Position barbell chest level on the rack; add resistance (plates) and attach safety clips
2. Take an **athletic stance**; stand straight, **feet are shoulder-width apart**; knees slightly flexed; toes point forward
3. Use a pronated grip (palms facing down) and place hands slightly wider than shoulder-width apart on the bar; wrists remain neutral and are in line with elbows; elbows remain close to the torso and point towards the ground; lift barbell off the rack and take a step back
4. Move head slightly backward, push barbell upward and extend the elbows; while barbell moves past the head, push head forward through the arms; look forward
5. Flex elbows, move head slightly back, and return barbell to starting position

RELEVANCE

- It is used to enhance strength of the deltoids/trapezius/triceps and to develop trunk musculature as stabilizer. It is an assistive lift since it has transfer in the lifting progression (e.g. overhead phase during push-press) and hence must be used in the Teaching/Hypertrophy Training Phase.
- Results in more powerful stroke production due to more efficient energy transfer



RUSSIAN TWIST

SUMMARY

The Russian Twist is an auxiliary exercise, which focuses on improving the synergy of the neuro-muscular system, strengthening the trunk lateral flexor and trunk rotator musculature, improving body control & coordination and flexibility as well as improving skill & balance foundation for complex movements.

DESCRIPTION

1. Place floor mat on the ground
2. Sit down on the buttocks, push chest forward, flex knees, and keep feet off the ground
3. Hold resistance (plate/MB) in both hands, rotate trunk to the left side, touch resistance placed next to the left hip to the ground, rotate trunk to the right side and touch resistance placed next to the right hip to the ground

RELEVANCE

- Strengthening the trunk (core) aids in more efficient energy transfer, which has a positive effect on stroke production (power) on the court
- Enhances strength of the obliques and quadratus lumborum and develops trunk musculature as stabilizer.
- Prevention of lower back pain due to pelvic instability

PURPOSE

1. Improving transfer of energy; synergy of neuro-muscular system
2. Strengthening of **trunk (lumbar) lateral flexor and rotator** (obliques & quadratus lumborum) musculature
3. Improving body control & coordination by enhancing stabilizers and gliding neutralizers
4. Improving flexibility
5. Improving skill and balance foundation for complex movements

KEY FACTORS

- Focus on perfect movement mechanics and range of motion
- Keep feet off the ground
- Maintain neutral head position

RECOMMENDED EXERCISES

1. Forward Lunge & Ankle Reach
2. Lunge with Bar Rotation
3. Supine Oblique Stretch



SUPINE HIP LIFT

SUMMARY

The Supine Hip Lift is an auxiliary exercise, which focuses on improving the synergy of the neuro-muscular system, strengthening the trunk flexor musculature, and improving body control & coordination and flexibility.

PURPOSE

1. Improving transfer of energy; synergy of neuro-muscular system
2. Strengthening of **trunk (lumbar) flexor** musculature
3. Improving body control & coordination by enhancing stabilizers and gliding neutralizers
4. Improving flexibility

DESCRIPTION

1. Place floor mat on the ground
2. Lie down in supine (face up) position, horizontally abduct shoulders (make a T) to 90°, keep knees extended (straight), and flex hips until feet point towards the ceiling (90° hip flexion)
3. In a controlled fashion, push feet straight upward farther towards the ceiling thereby flexing the lumbar spine and lifting buttocks off the floor
4. Slowly extend lumbar spine and return buttocks towards the ground without allowing the legs to swing

RECOMMENDED EXERCISES

Rectus Abdominis Flexibility

1. Forward Lunge & Overhead Reach

Oblique Flexibility

1. Forward Lunge & Ankle Reach
2. Lunge with Bar Rotation
3. Supine Oblique Stretch

RELEVANCE

- Strengthening the trunk (core) aids in more efficient energy transfer, which has a positive effect on stroke production on the court
- Enhances strength of the obliques and quadratus lumborum and develops trunk musculature as stabilizer.
- Prevention of lower back pain due to pelvic instability

KEY FACTORS

- Focus on perfect movement mechanics and range of motion
- Keep hips flexed at 90°
- Maintain neutral head position



RESISTANCE TRAINING: LOWER-BODY

Exercise	Sets	Reps	Intensity (% of 1 RM)	Rest (in sec.)	Duration (in min.)
Traditional Deadlift	3	12	70	90	6 ½
Back Squat	3	12	65	90	6 ½
Lateral Squat	3	12	65	90	6 ½
Seated Abduction	3	12	70	90	6 ½
RDL	2	12	65	90	4
Prone Leg Curls	3	12	70	90	6 ½
PB Leg Curls	3	12	70	90	6 ½
Leg Extension	3	12	70	90	6 ½
Seated Adduction	3	12	70	90	6 ½
SL RDL	3	12	70	90	6 ½
Total:	29	108		13 ½ min	62 ½ min

RDL = Romanian Deadlift PB = Physio Ball SL = Single Leg

Keep in mind that in order to maximize training results and efficiency it is extremely important to perform the above mentioned exercises with absolute precision rather than **amount of weight** lifted.

If you are unfamiliar with how to properly perform the presented exercises or want to have more background information on how stretching and weightlifting minimize the risk of injuries, increase your range of motion and therefore enhance your power potential and ultimately your overall on-court performance, ask your personal trainer or buy a good book. We recommend „**Advanced Concepts of Strength & Conditioning for Tennis**“ by the same author.

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1

ROMANIAN DEADLIFT (RDL)

SUMMARY

The Romanian Deadlift (RDL) is a compound exercise, which focuses on improving the synergy of the neuro-muscular system, strengthening the hip extensor & trunk extensor musculature, improving body control & coordination, pelvis flexibility as well as improving skill & balance foundation for complex movements.

Note: If the athlete has flexibility issues and/or for teaching purposes, a wider stance is warranted. If flexion of lumbar spine (rounding of lower back) occurs during hip extension then decrease resistance immediately!

DESCRIPTION

1. Position barbell on the rack; add resistance (plates) and attach safety clips; place barbell on the ground
2. Take an **athletic stance**; stand straight, **feet are shoulder-width apart**; knees slightly flexed; toes point slightly outward (10°-20°)
3. Use a **pronated grip** (palms facing down) and place hands just wider than shoulder-width on the bar; take barbell off the rack; stand up straight
4. First flex hips (~45°) to 90° (or as far as possible) **without** additional knee flexion; distribute weight through the heels; keep knees inside shoulders; maintain neutral spine position (push chest out and scapulae [shoulder blades] together; maintain neutral head position [look forward])
5. Extend the knees and hips while maintaining neutral spine position and return to starting position

KEY FACTORS

- Focus on perfect movement mechanics and range of motion
- Keep knees inside shoulders
- Distribute weight through heels
- Maintain neutral spine position
- Maintain neutral head position

PURPOSE

1. Improving transfer of energy; synergy of neuro-muscular system
2. Strengthening of **hip extensor** (hamstrings primary) and **trunk extensor** (erector spinae) musculature
3. Improving body control & coordination by enhancing stabilizers (e.g. lower back) and gliding neutralizers
4. Improving pelvis flexibility
5. Improving skill and balance foundation for complex movements

RELEVANCE

- It is used to enhance strength of the hamstrings and to develop lower back musculature as stabilizer. It is an assistive lift since it has transfer in the lifting progression (e.g. 1st & 2nd pulling phase during power clean from the floor) and hence must be used in the Teaching/Hypertrophy Training Phase.

RECOMMENDED EXERCISES

Hamstring Flexibility

1. Straight leg Kicks
2. MB Sagittal Reach (I)
3. Supine Towel Hamstring



1

PHYSIO BALL LEG CURL (I)

SUMMARY

The Physio Ball Leg Curl (I) is a functional training exercise, which focuses on improving the synergy of the neuro-muscular system, trunk stability, body control & coordination as well as improving skill & balance foundation for complex movements.

PURPOSE

1. Improving synergy of neuro-muscular system
2. Improving trunk stability for more efficient transfer of energy
3. Improving body control & coordination by enhancing stabilizers and gliding neutralizers
4. Improving skill and balance foundation for complex movements

DESCRIPTION

1. Place floor mat on the ground and lie down in supine position (face up); place physio ball in front of the feet
2. Extend knees and keep legs close together; move heels centered and on top of the physio ball; move arms out wide until shoulder is 90° horizontally abducted;
3. Elevate the trunk (hips) up high to neutral pelvic position (higher center of gravity)
4. Keep extending the hips and flex the knees
5. Keep trunk (hips) in elevated position and extend knees
6. Repeat

COMMON ERRORS

- Trunk elevation is low (low center of gravity)
- Head comes off the ground during motion
- Athlete loses balance

REQUIRED EQUIPMENT

- 1 Floor Matt
- 1 Physio Ball

RELEVANCE

- Results in more powerful stroke production on the court
- Results in overall change of direction (agility) improvements on the court

KEY FACTORS

- Focus on perfect movement mechanics and range of motion
- Maintain neutral pelvis position during movement
- Maintain stability



LATERAL SQUAT

SUMMARY

The Lateral Squat is a compound exercise, which focuses on improving the synergy of the neuro-muscular system, strengthening the hip abductors, hip extensor & knee extensor musculature, improving body control & coordination and flexibility as well as improving skill & balance foundation for complex movements.

Note: If the athlete has flexibility issues and/ or for teaching purposes, a stance wider than shoulder-width is warranted.

PURPOSE

1. Improving transfer of energy; synergy of neuro-muscular system
2. Strengthening of **hip abductor** (primary), hip extensor & knee extensor (secondary) musculature
3. Improving body control & coordination by enhancing trunk & hip stabilizers and gliding neutralizers
4. Improving flexibility
5. Improving skill and balance foundation for complex movements

DESCRIPTION

1. Position barbell chest level on the rack; add resistance (plates) and attach safety clips
2. Take an **athletic stance**; stand straight, **feet are just wider than shoulder-width apart**; knees slightly flexed; toes point slightly outward (10° - 20°)
3. Use a pronated grip (palms facing down) and place hands slightly wider than shoulder-width apart on the bar
4. Move head underneath the barbell and position barbell superior to the spine of the scapulae (on the top shelf created by the trapezius); do not place barbell on top of the cervical spine!
5. In athletic stance step sideways to the right, and drop hips in the center into the squat; knees are **outside** shoulders; keep weight on heels
6. Step out of the squat position to the right back to athletic stance
7. Step back into the position to the left by dropping hips in the center into the squat; knees are **outside** shoulders
8. Step out of the squat position to the left back to athletic stance

COMMON ERRORS

- Posterior pelvic tilt occurs; buttocks “tucks under”
- Bar is placed on top of cervical spine
- Flexion of thoracic spine (rounded back) during motion
- Athlete loses balance

DEGREE OF DIFFICULTY

- 1

REQUIRED EQUIPMENT

- 1 Rack
- 1 Barbell
- Plates
- 2 Safety Clips

RELEVANCE

- Results in faster running speed and better agility (change of direction) on the court due to more efficient energy transfer
- Improved accuracy and power when athlete is out of position during groundstroke production

KEY FACTORS

- Focus on perfect movement mechanics and range of motion
- Keep knees outside shoulders
- Distribute weight through heels
- Maintain neutral spine position
- Maintain neutral head position

FUNCTIONAL RANGE LIMITING FACTORS

1. Hip Flexibility (tight glutes & hamstrings)
2. Gluteus Medius & Minimus Flexibility
3. Upper Hamstring Flexibility
4. Weak Hip Extensors
5. Too Much Resistance

TARGETED MUSCULATURE

1. Gluteus Medius & Minimus
2. Gluteus Maximus
3. Hamstrings
4. Quadriceps

RECOMMENDED EXERCISES

Hamstring Flexibility

1. Straight leg Kicks
2. Romanian Deadlift
3. Supine Towel Hamstring

Gluteal Flexibility

1. Bilateral Squat
2. Deadlift
3. Supine Cross-Over



COMPENSATORY ACTION

1. Limited hip & knee flexion
2. Posterior Pelvic Tilt: buttocks tucks under during hip flexion
3. Posterior Pelvic Tilt: buttocks tucks under during hip flexion
4. Knees move medially (inwards)
5. Knees move laterally (outwards)

ACTION

1. Hip Abduction
2. Hip Extension
3. Hip Extension
4. Knee Extension

PLANE OF MOTION

1. Frontal
2. Sagittal
3. Sagittal
4. Sagittal

BREATH IN & OUT

- IN: Before Hip Flexion
- OUT: During Hip Flexion

1

RESISTANCE TRAINING: TOTAL-BODY

Exercise	Sets	Reps	Intensity (% of 1 RM)	Rest (in sec.)	Duration (in min.)
Forward Lunge	3	6/leg	70	90	6 ½
(assisted) Pull-ups	3	12	70	90	6 ½
Lateral Lunge	3	6/leg	65	90	6 ½
Incline DB Bench Press	3	12	70	90	6 ½
SL RDL	2	6/leg	65	90	4
Shoulder Shrugs	3	12	70	90	6 ½
Cable Bicep Curls	3	12	70	90	6 ½
Tricep Pushdown	3	12	70	90	6 ½
Supine Hip Lifts	3	12	-	90	6 ½
Russian Twist	3	12	20-45lb	90	6 ½
Supine Toe Touches	3	12	-	90	6 ½
Total:	32	132		16 ½ min	69 min

This training plan is based on exercises presented in chapter 6, “Resistance Training”, of „Advanced Concepts of Strength & Conditioning for Tennis”.

Keep in mind that in order to maximize training results and efficiency it is extremely important to perform the above mentioned exercises with absolute precision rather than **amount of weight** lifted.

If you are unfamiliar with how to properly perform the presented exercises or want to have more background information on how stretching and weightlifting minimize the risk of injuries, increase your range of motion and therefore enhance your power potential and ultimately your overall on-court performance, ask your personal trainer or buy a good book. We recommend „Advanced Concepts of Strength & Conditioning for Tennis” by the same author.

Advanced Concepts of Strength & Conditioning for Tennis

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1

FORWARD LUNGE

SUMMARY

The Forward Lunge is a compound exercise, which focuses on improving the synergy of the neuro-muscular system, strengthening the hip extensor & knee extensor musculature, improving body control & coordination, flexibility as well as improving skill & balance foundation for complex movements.

Note: If the athlete has flexibility issues drop body as low as possible. Exercise can also be performed by using body weight only!

PURPOSE

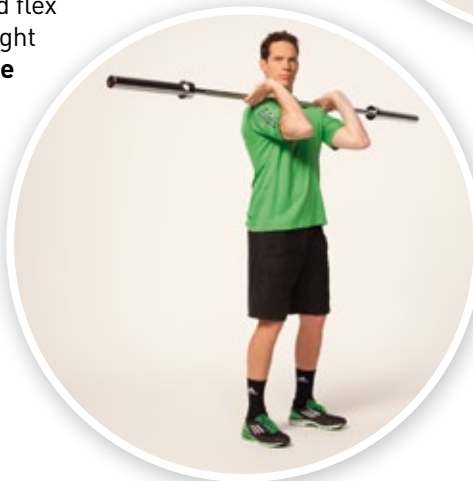
1. Improving transfer of energy; synergy of neuro-muscular system
2. Strengthening of **hip extensor** (glutes/hamstrings primary) & **knee extensor** (quadriceps secondary) musculature
3. Improving body control & coordination by enhancing stabilizers and gliding neutralizers
4. Improving flexibility for complex movements (e.g. gluteal flexibility for split-jerk)
5. Improving skill (hip flexion/extension) and balance foundation for complex movements

DESCRIPTION

1. Position barbell chest level on the rack; add resistance (plates) and attach safety clips
2. Take an **athletic stance**; stand straight, **feet are shoulder-width apart**; knees slightly flexed; toes point slightly outward (10° - 20°)
3. Use a pronated grip (palms facing down) and place hands slightly wider than shoulder-width apart on the bar
4. Move head underneath the barbell and position barbell superior to the spine of the scapulae (on the top shelf created by the trapezius); do not place barbell on top of the cervical spine! Move away from the rack
5. From athletic stance, step forward with the left foot and flex the right knee until right knee is at 90° and left knee is at 90° ; **hips drop down towards the ground in a straight line**; keep weight on heel of the front foot; knee must not move beyond toes; toes point forward
6. Push-off with the left foot, return to athletic stance, step forward with the right foot and flex the left knee until left knee is at 90° and right knee is at 90° ; **hips drop down towards the ground in a straight line**; keep weight on heel of the front foot; knee must not move beyond toes; toes point forward
7. Step out of the lunge position with front foot and return to athletic stance

REQUIRED EQUIPMENT

- 1 Rack
- 1 Barbell
- Plates (if necessary)
- 2 Safety Clips (if necessary)



LATERAL LUNGE

SUMMARY

The Lateral Lunge is a compound exercise, which focuses on improving the synergy of the neuro-muscular system, strengthening the hip abductors, hip extensor & knee extensor musculature, improving body control & coordination and flexibility and adductor dynamic range as well as improving skill & balance foundation for complex movements.

Note: If the athlete has flexibility issues and/ or for teaching purposes, a wider stance is warranted. Exercise can also be performed by using body weight only!

PURPOSE

1. Improving transfer of energy; synergy of neuro-muscular system
2. Strengthening of **hip abductors** (primary), hip extensors & knee extensor (secondary) musculature
3. Improving body control & coordination by enhancing trunk & hip stabilizers and gliding neutralizers
4. Improving flexibility and adductor dynamic range
5. Improving skill and balance foundation for complex movements

DESCRIPTION

1. Position barbell chest level on the rack; add resistance (plates) and attach safety clips
2. Take an athletic stance; stand straight, **feet are just wider than shoulder-width apart**; knees slightly flexed; toes point slightly outward (10° - 20°)
3. Use a pronated grip (palms facing down) and place hands slightly wider than shoulder-width apart on the bar
4. Move head underneath the barbell and position barbell superior to the spine of the scapulae (on the top shelf created by the trapezius); do not place barbell on top of the cervical spine!
5. Step sideways with the left foot and bend the left knee until left knee is at 90° and right leg is straight; keep weight on heels; knee must not move beyond toes; toes point slightly outward (10°-20°)
6. Push-off with the left foot, return to athletic stance, and lunge to the right side until right knee is at 90°; knee must not move beyond toes; toes point slightly outward (10°-20°)
7. Step out of the lunge position to the left back to athletic stance

DEGREE OF DIFFICULTY

- 1

REQUIRED EQUIPMENT

- 1 Rack
- 1 Barbell
- Plates (if necessary)
- 2 Safety Clips (if necessary)

RELEVANCE

- Results in faster running speed and better agility (change of direction) on the court due to more efficient energy transfer
- Improved accuracy and power when athlete is out of position during groundstroke production

KEY FACTORS

- Focus on perfect movement mechanics and range of motion
- Keep knees inside shoulders
- Distribute weight through heels
- Maintain neutral spine position
- Maintain neutral head position

RECOMMENDED EXERCISES

Hamstring Flexibility

1. Straight leg Kicks
2. Romanian Deadlift
3. Supine Towel Hamstring

Gluteal Flexibility

1. Bilateral Squat
2. Deadlift
3. Supine Cross-Over

COMMON ERRORS

- Posterior pelvic tilt occurs; buttocks “tucks under”
- Bar is placed on top of cervical spine
- Flexion of thoracic spine (rounded back) during motion
- Athlete loses balance

BREATH IN & OUT

- IN: Before Hip Flexion
- OUT: During Hip Extension

TARGETED MUSCULATURE

1. Gluteus Medius & Minimus
2. Gluteus Maximus
3. Hamstrings
4. Quadriceps

ACTION

1. Hip Abduction
2. Hip Extension
3. Hip Extension
4. Knee Extension

PLANE OF MOTION

1. Frontal
2. Sagittal
3. Sagittal
4. Sagittal



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