

When Building Muscles, Start at the Core

- Dr. Clint Steel, USA Hockey June/July 2001 (also includes material from USA Hockey 1998)

One of the areas that most players, especially young players, don't work on is an area commonly referred to as the core.

The core consists of the abdominal muscles (which include the rectus abdominus and probably more important, the transverse abdominus), the internal and external obliques, the lower back and the hips.

The Core obviously links the lower body to the upper body. But more importantly, a strong core allows a hockey player to transfer the power generated by the lower body to the upper body, absorb and generate impact, and skate efficiently. A strong core will allow all your movements to be more powerful, quicker and more precise.

A Strong Core is important for...

Skating

Strong core muscles make you more stable on your skates and give you more balance. As you begin to skate, you must first be able to hold your midsection and upper body in a position that allows you to extend your legs. This also helps in the recovery by helping to pull the leg back to the midsection. When skating, the core/trunk area is in a constant state of isometric contraction which allows the skater to better control his/her movements.

Shooting

Before you can take a slap shot, the core muscles must contract to help stabilize your body. As you follow through with the slap shot, much of the force generated is created in the core muscles.

Injury prevention

A strong core will also help decrease your risk of injury.

How to train the core...

There are many different factors and motions that contribute to having a strong and stable core area. This area should be trained in a fashion such that is multi-dimensional and multi-plane. Always train all of the muscle to avoid imbalances.

Types of Motion

1. Flexion
2. Extension
3. Lateral Flexion
4. Hyperextension
5. Rotation
6. Diagonal Rotation
7. Stabilization (isometrics)

All of these motions must be targeted in order to prepare for... shots on goal, falls, changes of direction, etc. Take caution when training the core and remember that we are trying to prevent injuries, not have them occur.

Tips:

- Make sure you warm up properly before attempting any core exercises.

Core/Abdominals

- Abdominal and core work should be done before any heavy lifting to aid as a warm-up and to make sure it gets done.
- Work Lower Abs before Upper Abs
- Do Twisting (Oblique) Upper Abs before Straight Upper Abs Exercises
- The goal, whether it is more muscular endurance or strength, will decide the reps, sets, and intensities.
- Total control of the torso is necessary to get the most benefit out of these exercises. Slow and controlled motion is required on all except the Medicine Ball twists and throws.
- You are not looking for speed. On applicable exercises, hold your position and isolate the muscles before proceeding on to the next repetition.

Core/Abdominals Program

3 times per week

Before lifting

A. General Warm-up

B. Dynamic Flexibility

C. Lower Abdominals Select up to 3 Exercises, perform 3 sets total

D. Obliques Select up to 3 Exercises, perform 3 sets total

E. Upper Abdominals Select up to 3 Exercises, perform 3 sets total

F. Back Exercises 1 set of Superman Pushups and 1 set of Aquaman Push-ups

G. Bridging Exercises

a. Back: Select up to 2 exercises, perform 2 sets total

b. Side: Select 1 of the exercises, perform 1 set total

c. Stomach: Select 1 of the exercises, perform 1 set total

H. Rotation Select 1 of the exercises, perform 1 set total

I. Push-ups Select up to 3 Exercises, perform 3 sets total

Abdominals Index – Taken in part from UW-Madison, 1998

Lower Abdominal Exercises

Select up to 3 Exercises, perform 3 sets total:

<u>Reps/Secs</u>	<u>Name</u>	<u>Description</u>
25-30	Leg Raises	Hands under hips, legs straight, feet do not touch ground
30-35	Throw downs	With partner: alt front, R & L, legs straight don't touch ground
20-25	Pikes	Arms/Legs straight, reach to touch ankles above torso, don't touch ground
20-25	Alternating Pikes	Same as pikes except opposite hand to opposite foot
30-40 s	Vertical Flutter Kicks	Straight legs, quickly scissor kick legs up and down
30-40 s	Horizontal Flutter Kicks	Straight legs, quickly cross L over R & R over L
25-30	Straight Leg Hip Raises	With hips off ground, imagine putting footprints on ceiling
20-25	Hanging Knee Ups	Bend knees & lift them all the way to chest, curl pelvis
10-15	Hanging Leg Raises	Slight knee bend, raise legs until knees to chest, curl pelvis

Core/Abdominals

Oblique's (Twisting Exercises) – work the external upper abs

Select up to 3 Exercises, perform 3 sets total:

<u>Reps/Secs</u>	<u>Name</u>	<u>Description</u>
30-40	Side Crunches	Lie on one side, raise torso “up” toward ceiling, at end of set hold for 10 sec. (isometry) then do 10 smaller crunches
30-40	Opposite Elbow to Opposite Knee	Lying straight on one side, rotate lower elbow to bent upper knee
30-40	Same Elbow to Same Knee	Lying straight on one side, crunch forward to touch upper elbow to bent knee
25-50	Russian Twist - Walking	
25-50	Seated Solo Half Twist	
25-50	Seated Solo Full Twist	
10-15	Russian Twists (Seated Twists)	Use 10 lb plate, keep arms straight, feet off ground, be sure to rotate torso with plate
25-50	Medicine Ball Sit Up and Twist	
25-50	Rocky Half Twist	
25-50	Rocky Full Twist	
25-50	Standing Side to Side Passes	
25-50	Partner Straddle Sit Passes	
25-50	Hammer Throw	
30-40	Crunches: Beginner – Obliques	Bent-knee sit-up position, raise shoulders, upper back and R hip towards L knee, hold for at least 1 sec, slow return, alternate sides

Upper Ab Exercises – work the upper abs only

Select up to 3 Exercises, perform 3 sets total:

<u>Reps/Secs</u>	<u>Name</u>	<u>Description</u>
25-50	Crunches: Toe Touches	
25-50	Crunches: Beginner Beginner (feet in air) Intermediate Advanced	Bent knee, slowly raise shoulders/upper back 30° off ground and hold for 1 sec., return to start. Don't pull head. 1 rep should take 2 sec.
25-50	Medicine Ball Overhead Crunch	
25/15/10	Crunch and Holds	25 crunches, hold for 25 sec – 15 crunches, hold for 15 sec – 10 crunches, hold for 10 sec
10-15 ea	Crunches: Beginner - Alternate Elbow/Knee:	Bent R leg over straight L leg, raise L leg up and crunch. Alternate using bent L leg over straight R leg
25-50	1/2 Twist	Knees and hips at 90° bend, torso off ground at 45° rotate right elbow to left knee.
ea. side		
30-45s	Bicycle	Quickly touch opposite elbow to opposite knee, extend legs straight, feet up
25-30	Rocky's	With partner sitting on shins, person on floor with hands at side of head, twist torso to touch elbows to partners extended hands which are in front of face
25-50	1/4 Sit Ups	Sit up position, so knees and hips at 90° bend, raise and lower torso as quick as possible – Difference is “UP” with torso rather than “to the knees” as with crunches
30-40s	V-Sit	Straight legs at 45° off ground, straight arms pointing same way as legs
30-40	Froggers	Assume V-Sit position, extend body almost flat yet keeping shoulders/legs off ground, bend knees to chest and touch outside ankles
30-40	Toe Touches Vertical	Legs straight above head, small move to quickly reach for toes

Core/Abdominals

Back Exercises – Be sure to work back muscles which “oppose” and balance ab muscles

Perform 1 set each of Inch worm, Superman Pushups and Aquaman Push-ups:

<u>Reps/Secs</u>	<u>Name</u>	<u>Description</u>
15-20	Superman Push-ups: Beginner	
15-20	Superman Push-ups: Intermediate	
15-20	Superman Push-ups: Advanced	
2 X	Inch Worm	
15-20	Aquaman Push-ups	

Bridging Exercises

Back: Select up to 2 of the following exercises, perform 2 sets total:

<u>Time</u>	<u>Name</u>	<u>Description</u>
1:00-3:00	Back Bridge	
0:30-2:00	One-Legged Back Bridge	
1:00-3:00	Lift Bridge	
0:30-2:00	Alternate Leg Lift Bridge	
1:00-3:00	Seal Bridge	
1:00-3:00	Seal Bridge with Leg Lift	
0:30-2:00	Side Bridge – Bent Arm	
0:30-2:00	Side Bridge – Straight Arm	
0:30-2:00	Side Glute Bridge	

Side: Select 1 of the following exercises, perform 1 set total:

<u>Time</u>	<u>Name</u>	<u>Description</u>
0:30-2:00	Side Bridge – Bent Arm	
0:30-2:00	Side Bridge – Straight Arm	
0:30-2:00	Side Glute Bridge	

Stomach: Select 1 of the following exercises, perform 1 set total:

<u>Time</u>	<u>Name</u>	<u>Description</u>
0:45-1:30	Superheroes	
1:00-2:00	Alternating Superheroes	10 sec shifts & alternate x 3ea
0:45-1:30	Crosses	

Rotation

Select 1 of the following exercises, perform 1 set total:

<u>Reps</u>	<u>Name</u>	<u>Description</u>
10-15 each way	Pendulum Swings	
15-20 each way	Bent Knee Pendulum Swings	
10-15 each way	Leg Circles	
10-15 each way	Side Bridge Leg Circles	

Core/Ab Exercises Explained

Lower Abdominal

Leg Raises

Hands under hips, legs straight, feet do not touch ground



Throw downs

With partner: alt front, R & L,
Legs straight don't touch ground

Pikes

Arms/Legs straight,
Reach to touch ankles above torso,
(Both legs and arms move toward each other)
Don't touch ground



Alternating Pikes

Same as pikes except opposite hand to opposite foot



Vertical Flutter Kicks

Straight legs,
Quickly scissor kick legs up and down



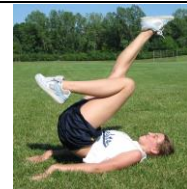
Horizontal Flutter Kicks

Straight legs,
Quickly cross L over R & R over L



Straight Leg Hip Raises

Start with hips off ground, legs straight and together
with feet directly above head.
Push hips upward
Imagine putting footprints on ceiling



Core/Abdominals

Hangin Knee Ups

Hanging from pull-up bar,
Bend knees & lift them all the way to chest by
curling pelvis

Hangin Leg Raises

Hanging from pull-up bar,
Keeping a slight knee bend throughout exercise,
Raise legs by curling pelvis until knees are to the
chest and toes point straight up.

Upper Abdominals – Obliques

Side Crunches

Lie on one side,
Raise torso “up” toward ceiling
At end of set hold for 10 sec. (isometry) then do 10
smaller crunches



Opposite Elbow to Opposite Knee

Lying straight on one side,
Rotate lower elbow to bent upper knee



Same Elbow to Same Knee

Lying straight on one side,
Crunch forward to touch upper elbow to bent knee



with Medicine Ball...

Russian Twist - Walking

Starting Position: Start with the ball extended away
from the chest.

Movement Description: Walk forward and swing
the ball to the side of the front leg, alternating the
ball with each step.

Rhythm/speed: Moderate

Weight 6.6 lbs for a beginner
of ball: 11 lbs for advanced



Seated Solo Half Twist

Core/Abdominals

Starting Position: Sitting with your knees bent at 45°, feet flat on the floor and ball at chest height.

Movement Description: Twist torso until ball touches floor both left and right.

Rhythm/speed: Moderate to fast

25-50 reps.

Weight of ball: 4.4 lbs for a beginner
11 lbs for advanced

Seated Solo Full Twist

Starting Position: Sitting with your knees bent at 45°, feet flat on the floor and ball at chest height.

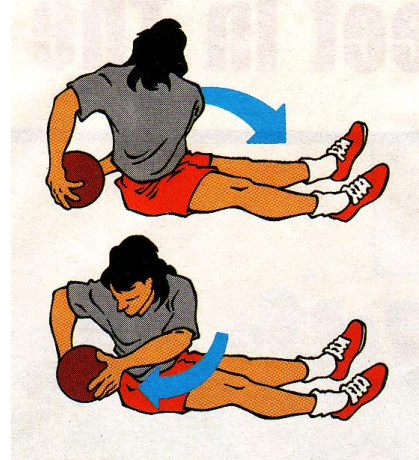
Movement Description: Rotate the torso and place ball behind back. Twist other direction and retrieve ball. Continue in same direction.

Complete both left and right

Rhythm/speed: Fast

25-50 reps.

Weight of ball: 6.6 lbs for a beginner
11 lbs for advanced



USA Hockey 2000

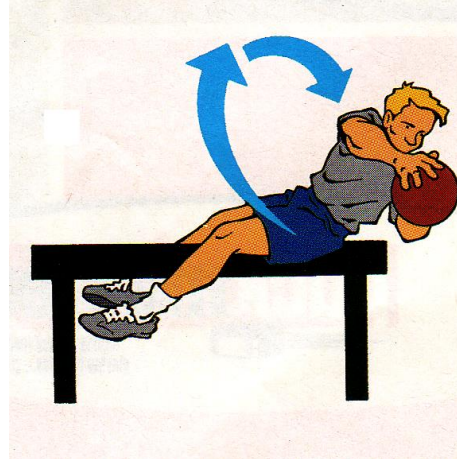
Russian Twist - Sitting

Starting Position: Straddle sit position with knees bent and the body inclined at 45°. Hold the ball away from your chest with your feet hooked under a bench.

Movement Description: Keep the legs and hips stationary and the arms extended, twist the torso around to the right and then to the left. Pause one count in front of the body to begin each repetition.

Rhythm/speed: Moderate

Weight of ball: 4.4 lbs for a beginner
11 lbs for advanced



USA Hockey 2000

Medicine Ball Sit Up and Twist

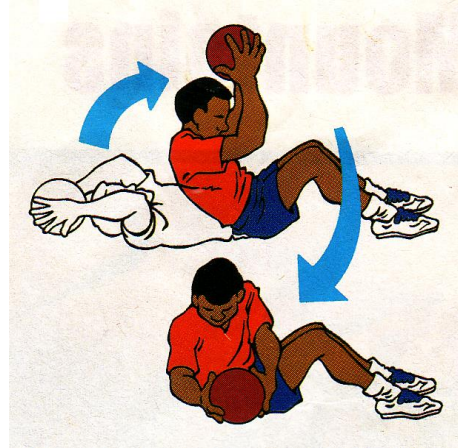
Starting Position: Sitting with your knees bent at 45°, feet flat on floor and ball extended overhead.

Movement Description: Sit with back to the ground. Hold the ball overhead, sit up and twist, touching the ball to the right. Return to starting position and repeat to the left.

Rhythm/speed: Moderate to fast

25-50 reps

Weight of ball: 4.4 lbs for a beginner
11 lbs for advanced



USA Hockey 2000

Rocky Half Twist

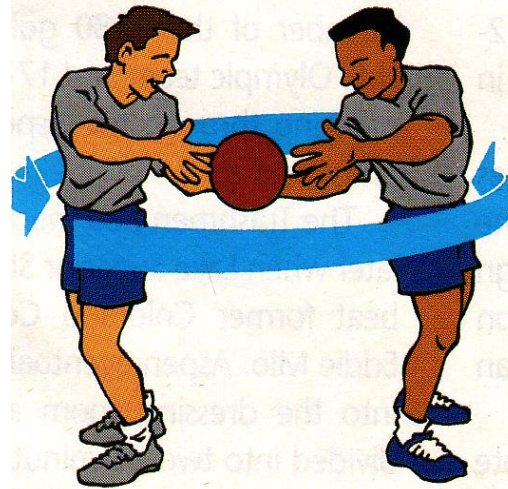
Starting Position: Standing with your back to the partner an arm's length away with the ball held extended out from the chest.

Movement Description: Keeping the feet and hips stationary, twist the torso and pass the ball to the partner who twists in the same direction. The pass is executed right to left and left to right

Rhythm/speed: Moderate to fast.

Weight of ball: 6.6 lbs for a beginner
11 lbs for advanced

Variations: Kneeling
Sitting



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Rocky Full Twist

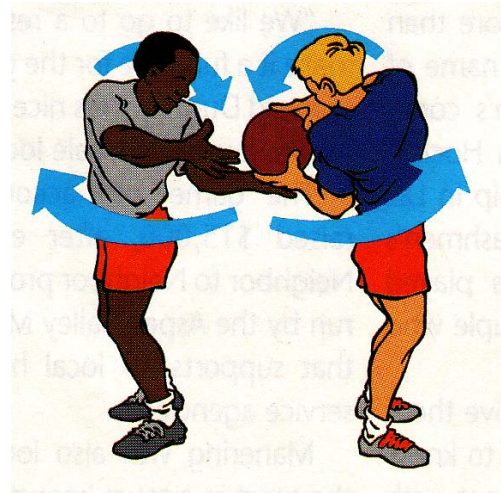
Starting Position: Stand with your back to a partner an arm's length away with the ball held extended out from the chest

Movement Description: Keeping your feet and hips stationary, twist the torso and pass the ball to the partner who twists the opposite direction. The pass is executed right-to-right and left-to-left.

Rhythm/speed: Moderate to fast

Weight of ball: 6.6 lbs for a beginner
11 lbs for advanced

Variations: Kneeling
Seated



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Core/Abdominals

Standing Side to Side Passes

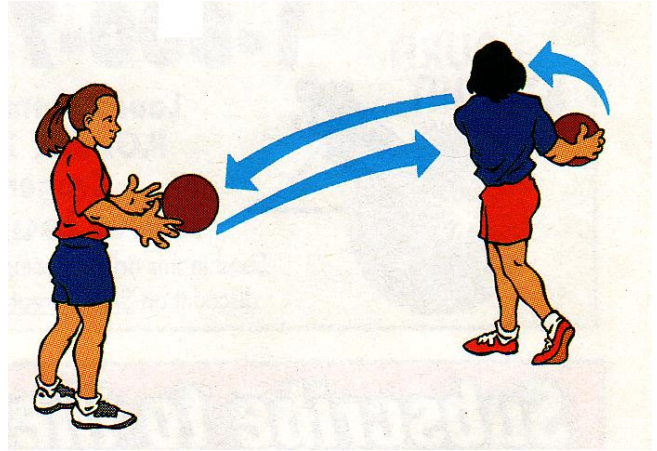
Starting Position: Standing with the ball held waist high off the hip.

Movement Description: Pass the ball to the outside of the partner's opposite hip forcing the partner to twist to that side upon catching the ball. Throw back to the same side from which the throw originated.

Rhythm/speed: Controlled

Weight of ball: 6.6 lbs for a beginner
11 lbs for advanced

Variations: Kneeling
Against a wall w/out partner



USA Hockey 2000

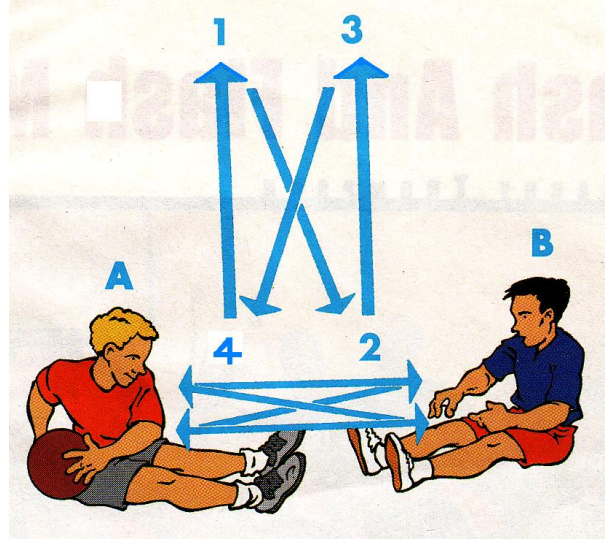
Partner Straddle Sit Passes

Starting Position: Seated facing a partner with the ball held at the side just off the hip.

Movement Description: Partner A passes ball down the side to partner B. Partner B passes the ball diagonally across to partner A's opposite side. Partner A then passes to B down this side and B returns ball diagonally to A at starting point. Repeat for the desired number of repetitions and switch the pattern so that each partner is doing the opposite action

Rhythm/speed: Moderate, emphasizing stretch upon catching the ball.

Weight of ball: 6.6 lbs for a beginner
11 lbs for advanced



USA Hockey 2000

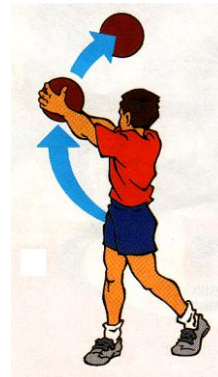
Hammer Throw

Starting Position: Standing in a straddle position with a medicine ball held waist high off the hip and with your back to a partner or wall.

Movement Description: Swing the ball from the hip and throw over the opposite shoulder to a partner or against the wall.

Rhythm/speed: Fast and explosive

Weight of ball: 4.4 lbs for a beginner
11 lbs for advanced



Upper Abdominals

Crunches: Toe Touches

Start by laying flat on your back with legs straight up, tailbone on the ground.



Core/Abdominals

Slowly reach up and touch toes, lifting your shoulders off the ground.

Keep legs straight.

25-50 reps.



Crunches: Beginner

- Start by laying flat on your back, and bend your knees so your feet are flat on the ground.
 - Slowly lift your shoulders off the ground, forcing your chest to move towards your knees.
 - Stop when back is 30° off ground
 - Hold for at least 1 second
 - Slow return
 - Entire rep should take 2 sec.
 - A great way to picture the movement is to pretend someone has a string attached to your upper chest. As they stand above you they pull on the string, forcing your shoulders off the ground.
 - Keep your head looking up and try not to flex it forward.
 - Keep your arms crossed on your chest.
- 25-50 reps.



Variations: **Feet in Air:** Feet off the ground, knees bent at 90° and a 90° angle at the hips. Crunch up until shoulder blades are off the ground. Keep low back in the ground.

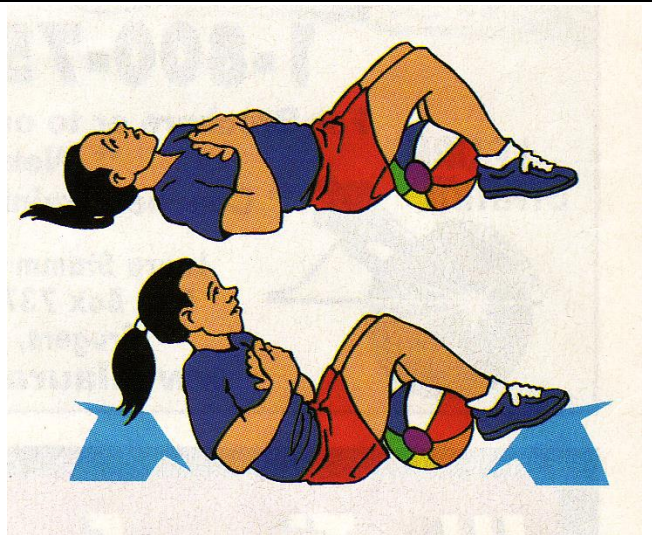
Obliques: To work obliques, you will want to alternate touching the opposite knee and elbow as you rise off the floor.

Alternate Elbow/Knee: Sit-up position with right foot on left knee. Bring left elbow to right knee. Do not pull on head. Complete each side.

Wide Leg: Legs are straight instead of bent and feet are spread apart

Crunches: Intermediate

- Find a beach ball or a Swiss training ball, if you have access to one. If not, you may even use a basketball or soccer ball.
- Position yourself as described above. Place the ball under your knees so that you can pinch the ball with your feet up against the back of your legs.
- Simply perform the crunch as described in the beginning section, but now you also want to lift the ball off the ground as you raise your shoulders off the ground.
- This does two things. First, it allows you to work the very important lower core muscles. Second, it allows you to focus on your core muscles without working the upper leg muscles that are often worked when doing crunches and sit-ups.
- To work the obliques, simply twist your knees as your feet come off the ground and again attempt to touch opposite elbow to knee.



Crunches: Advanced

- You will probably want to use a smaller ball for this exercise. Instead of a beach ball or Swiss ball, try using a soccer ball.
- Lie flat on your back with the ball in your hands. Raise your feet so that your legs are straight and your feet are above your body.
- Raise your upper body off the ground with the ball in your hands and attempt to place the ball between your feet.
- Leaving the ball between your feet, slowly lower your upper body to the floor. As soon as your shoulder blades touch the ground, perform the process again, only this time pulling the ball away from your feet.
- To work the obliques, put both hands on one side of the ball when placing or taking the ball between the feet.
- Be sure to work both sides.



USA Hockey 2001

Medicine Ball Overhead Crunch

Starting Position: Sit-up position, knees bent at 45°, feet flat on the floor and ball extended directly above the chin.

Movement Description: Crunch up, driving the ball to the sky. Slowly return to floor.

Rhythm/speed: Moderate to fast

25-50 reps.

Weight of ball: 4.4 lbs for a beginner
11 lbs for advanced

Crunch and Holds

- 25 crunches, hold for 25 sec
- 15 crunches, hold for 15 sec
- 10 crunches, hold for 10 sec

1/2 Twist

Knees and hips at 90° bend

Torso off ground at 45°

Rotate right elbow to left knee.



Bicycle

Quickly touch opposite elbow to opposite knee,

(Similar to 1/2 Twist, only knees move as well)

Extend legs straight, feet up

Core/Abdominals

Rocky's

With partner sitting on shins,

Person on floor with hands at side of head, Twist torso to touch elbows to partners extended hands which are in front of face

1/4 Sit Ups

Sit up position, knees and hips at 90° bend,

Raise and lower torso as quick as possible

Difference is "UP" with torso rather than "to the knees" as with crunches



V-Sit

Straight legs at 45° off ground,

Straight arms pointing same way as legs

(Similar to Pikes except legs remain stationary)



Froggers

Assume V-Sit position,

Extend body almost flat yet keeping shoulders/legs off ground,

Bend knees to chest and touch outside ankles



Toe Touches Vertical

Legs straight above head,

Small move to quickly reach for toes



Back Exercises

Superman Push-ups: Beginner

- Start by laying face down on the floor.
- Simply raise your body so that your toes and your elbows/forearms are the only areas of your body touching the floor.
- The elbows should be located directly below the upper chest.
- Hold for several seconds and let yourself back down.

15-20 reps

Hold for 30 seconds before moving on to next level



Superman Push-ups: Intermediate

- Perform the same exercise as described in the beginner section but now move your elbows out farther from your feet, more towards the top of your head. This will create more stress on the core muscles.
- Make sure your midsection does not “sag” while you perform this exercise.
- The farther you move your arm out towards your head, away from your body, the more difficult the exercise.



Variation: **Obliques:** To place more stress on the oblique muscles you may want to move your upper body to the left as far as possible and then to the right as far as possible while staying on your elbows.

Superman Push-ups: Advanced

- Lay flat on the floor with arms extended out over your head.
- Now attempt to lift your body off the ground allowing only your toes and hands to touch the ground.
- This is very difficult and most athletes I work with, even some pros, have a hard time performing this exercise.



Inch Worm

- Start in push-up position.
- Simply raise your body so that your toes and your palms are the only areas of your body touching the floor.
- Walk your hands inch by inch, further and further away from your head until you reach the Advanced Superman Push-up position.
- Walk your hands back in under your body

Walk out and back in 2 times

Aquaman Push-ups:

- Same position as Superman’s
- Raise left arm and right leg
- Hold 3-4 seconds
- Repeat with opposite hand and arm
- 15-20 reps.

Beginner, Intermediate and Advanced, just like Superman’s



Bridging Exercises

Back Bridge

Sit-up position.

Push hips toward sky.

(Shoulders remain on ground)

Hold at top with knees, hips and shoulders in a straight line.

Hold 1:00-3:00



One-Legged Back Bridge

Same as Back Bridge only...

Straighten one leg keeping knees together.

Hold 0:30-2:00

Repeat for alternate leg.



Lift Bridge

Sitting on floor, torso vertical with legs straight.

Hands positioned below shoulders.

Push hips toward sky while straightening arms.

Only palms and heels remain on ground

Keep body flat – heels, knees, hips and shoulders in line

Hold 1:00-3:00



Alternate Leg Lift Bridge

Sitting on floor, torso vertical with legs straight.

Hands positioned below shoulders.

Push hips toward sky while straightening arms.

Straighten out one leg so it is parallel to ground.

Hold 0:30-2:00

Repeat for alternate leg



Seal Bridge

Lying on stomach, place forearms on ground under armpits.

Extend the shoulder keeping the forearms flat.

Head up, back flat

Stay up on toes and forearms



Core/Abdominals

Hold 1:00-3:00

Seal Bridge with Leg Lift

Same position as Seal Bridge.

Lift one leg off of ground.

Hold 1:00-3:00

Repeat for alternate leg



Side Bridge – Bent Arm

On side, extend arm out 90° with elbow bent and forearm on the ground.

Keep body in a straight line.

Hold 0:30-2:00

Repeat for alternate side



Side Bridge – Straight Arm

On side, extend arm out straight with palm on the ground.

Keep body in a straight line.

Hold 0:30-2:00

Repeat for alternate side



Side Bridge Straight Arm Leg Circles

On side, extend arm out straight with palm on the ground.

Keep body in a straight line.

Raise upper leg until it is parallel to ground

Keeping leg straight, rotate foot in a 1 foot diameter circle perpendicular to the ground

10-15 circles each direction (CCW & CW)

Repeat for alternate leg.



Side Glute Bridge

On side, extend lower arm out straight pointing away from head, in line with body. Upper hand on upper hip.

Raise hip off of ground.

Hold 0:30-2:00

Repeat for alternate side



Core/Abdominals

Core/Abdominals

Superheroes

Lying face down on floor with arms together pointed straight away from head, in line with body.

Raise arms and legs a couple of inches off of the ground.

Hold 0:45-1:30



Alternating Superheroes

Lying face down on floor with arms together pointed straight away from head, in line with body.

Raise left arm and right leg 1-2 feet off of ground.

Hold 10-20 sec. then alternate to right arm and left leg for 10-20 sec.

3X each



Cross Bridge

Lying face down on floor with arms together pointed straight away from head, in line with body.

Raise arms and legs a couple of inches off of the ground.

While arms are in air, spread them out to the sides of body, in line with shoulders.

Hold 0:45-1:30



Rotation Exercises

Pendulum Swings

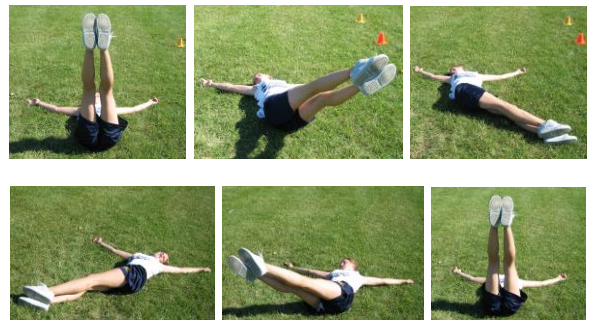
Start lying on back with arms spread out to sides in line with shoulders.

Legs are straight, together and pointing straight up above the hips.

Keeping legs straight and together, swing toes down to touch ground on one side of body.

Return legs back above hips.

10-15 repetitions each way.



Core/Abdominals

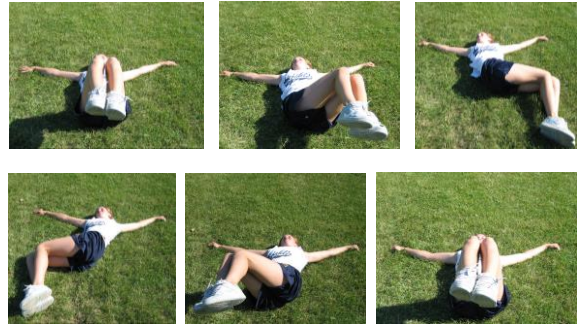
Bent Knee Pendulum Swings

Same as Pendulum swings only bend legs at the knee so knees point directly up and calves are parallel to ground.

Keeping legs together, swing knees down to touch ground on one side of body.

Return knees back above hips.

15-20 repetitions each way.



Leg Circles

Hands under hips, legs straight, feet do not touch ground (similar to leg raises)

Keeping legs straight, together and off the ground at 30°, swing legs in a counter-clockwise motion around your torso.

Try to maintain feet at constant height as low as possible.

10-15 circles each direction (CCW & CW)

