

Quality “Abb” Training

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ABSTRACT

In this article we are going to look at what rectus abdominis (RA) is designed to do, then take a look at some quality exercises for training RA. Some of the exercises featured in this article are exercises that I have picked up over the years, some of the exercises I have designed myself, while some of the exercises I have redesigned to add further progressions or to make them biomechanically more effective.

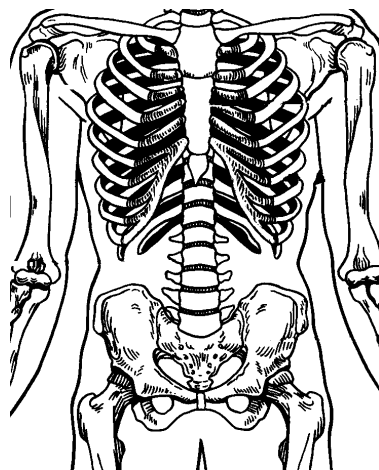
Rectus Abdominis

RA is two bands of muscle (left side and right side) whose origins are the crest of the pubis and insertions are the cartilage of the fifth, sixth and seventh ribs and the xiphoid process.

RA actions are lumbar flexion which involves both left and right sides, lateral flexion to the right which involves the right side of the muscle and lateral flexion to the left which involves the left side of the muscle.

What is Rectus Abdominis designed to do?

- 1) I like to think of RA as a hinge right in the centre of the body. When lying supine, if the lower body is stable, RA pulls the ribcage to the pelvis, if the upper body is stable, RA pulls the pelvis to the ribcage and with a little experience you can stabilise the lumbar region of the spine and pull your pelvis and rib cage together at the same time.
- 2) RA also helps to protect your internal organs. If we look at the anterior section of the torso (in particular the section directly under RA), you'll notice a large open section between the 7th rib and the anterior section of the pelvis (pubis). Within this large opening lies our intestines and other internal organs, posteriorly and laterally these organs are protected by our rib cage, anteriorly they are covered and protected by RA. In one of my sporting disciplines “Muay Thai”, RA can be trained to take the impact of a round kick that is powerful enough to break a wooden baseball in half.



- 3) RA is also responsible for holding the pelvis in set positions, as mentioned previously if the upper body is stable, tension from RA will move the pelvis, excessive tension on RA will produce excessive posterior pelvic tilting while a weak and lengthened RA will produce excessive anterior pelvic tilting. Our body is designed to work most efficiently with the spine in the neutral position; this is only possible when there is sufficient abdominal strength to hold the pelvis in its correct position.
- 4) RA also works with Transversus abdominis (TA), assisting in core stability and stabilising the trunk. Abb bracing is an exercise where the participant contracts RA, making RA ridged which in turn helps to stabilise the trunk, this voluntary contraction also exerts downward pressure onto TA which assists in building intra abdominal pressure. RA also assists in core stability in instances where the body is in an upright position, applying near maximal to maximal force, while at the same time being under a considerable amount of compressive force (exercises such as squats, deadlifts, military press, cleans etc). This involuntary contraction by RA works the same way a weight belt works, acting as an external corset by holding everything in place and as it contracts, giving TA a firm base to contract against, this involuntary contraction by RA is another form of Abb bracing

You can easily test this out yourself, the next time your clients are performing squats or deadlifts, stand behind them and firmly press your finger tips into their RA region, on a 10 RM you will notice very little contraction of RA, on a 5RM you will notice a partial contraction of RA, on a 1-2 RM you will notice that RA is rock hard.

Posterior pelvic tilting

Posterior pelvic tilting (PPT) is where the top of the pelvis (ilium) tilts posteriorly and the base of the pelvis (pubis) tilts anteriorly. PPT is achieved through stabilising the upper body and pulling the pelvis to the rib cage. The easiest way to learn a PPT is to lay supine on the ground with your knees up and your feet flat on the ground and close to your buttocks, you then flatten your lumbar curve by pressing it into the ground as you pull your pelvis to your ribcage.



When strength in RA is significantly developed from performing this type of movement, not only can the lumbar region of the spine be pushed into the ground and flatten out, the pelvis can also be raised off the ground at the same time.



RA isolation exercises “ribs to pelvis while pelvis is stable”

CURL UP – In this exercise the participant lies supine with their knees up and their feet flat on the ground and close to their buttocks, the participant straightens their arms and places their hands on their thighs, initially the participant slowly curls up (with their spine in the neutral position) to see how high they can run their hands up their thighs. For consistency we need some sort of gauge to work to ie.

- 1) Finger tips to the top of the knees.
- 2) First knuckle joint to the top of the knees.
- 3) Second knuckle joint to the top of the knees.
- 4) Base of the fingers to the top of the knees.
- 5) Base of the thumb to the top of the knees.
- 6) Wrist to the top of the knees
- 7) 1 inch past the wrist to the top of the knees
- 8) Able to sit right up.

Once the participant has established their gauge, they conduct their curl up with a 2-3 concentric contraction, a 1-2 second pause and a 2 second eccentric contraction.

The participant continues to perform their curl ups until they can no longer keep form.

If the only way the participant can reach their gauge is to speed up the movement, then it's time to stop.

If the participant can reach their gauge and cant hold for 1-2 seconds, then it's time to stop.

If the participant cant maintain a neutral spine throughout the exercise, then it's time to stop.

If the participant can reach 15 repetitions while maintaining good form, then it's time to go on to their next gauge/progression.



PPT & CURL UP – In this exercise a PPT is performed before the curl up, you may find that the extra effort required to perform the PPT may reduce the height (your gauge) you previously achieved. Initially the PPT is performed on the concentric phase only, then with a little more experience you will be able to maintain a PPT through both the concentric and eccentric phases.

(Now that the lumbar section of the spine is flattened out neutral spine refers only to the thoracic and cervical section of the spine)

WALL CRUNCH – In this exercise the participant lies supine with their feet flat on a wall with their knees and hips at approximately 90 degrees, the participant places their fingertips on their shoulders and points their elbows at their knees, then slowly crunches up in an attempt to touch their thighs with their elbows. If the participant can't touch their thighs with their elbows, they need to move their buttocks closer to the wall, if the participant can easily touch their thighs with their elbows, the participant needs to move their buttocks further away from the wall, ideally the participant is set up so they can just reach their thighs with their elbows.

Once the participant has established their gauge, they conduct their crunches with a 2-3 second concentric contraction, a 1-2 second pause and a 2 second eccentric contraction.

The participant continues to perform their crunches until they lose form.

If the participant can no longer touch their thighs with their elbows, then it's time to stop.

If the only way they participant can touch their thighs with their elbows is to speed up the movement, then it's time to stop.

If the participant can touch their thighs with their elbows but can't hold for 1-2 seconds, then it's time to stop.

If the participant can no longer hold a neutral spine, then it's time to stop.

If the participant can reach their repetition goal with ease, while maintaining good form they need to move their buttocks further away from the wall.



PPT & CRUNCH – In this exercise a PPT is performed before the crunch, you'll find that it is somewhat easier to perform your PPT when attempting crunches as the 90-degree bend at the hips assists in flattening out your lumbar curve. Initially the PPT is performed on the concentric phase only, then with a little more experience you will be able to maintain a PPT through both the concentric and eccentric phases.

(Now that the lumbar section of the spine is flattened out neutral spine refers only to the thoracic and cervical section of the spine)

RA isolation exercises “pelvis to ribs while ribs are stable”

REVERSE CURL – In this exercise the participant lies supine with their arms out straight over their head and parallel with the ground (to build a stable base for the upper body), knees are pulled into the chest to the point where the pelvis is just in contact with the ground. The objective here is initiate the reverse curl by performing a PPT and pushing the lumbar region of the spine into the ground, then continue the movement by bringing the pelvis as close as possible to the ribcage, then returning to the start position. This exercise is conducted with a 2-3 concentric contraction, a 1-2 second pause and a 2 second eccentric contraction.



INCLINE REVERSE CURL – This exercise is the next progression from the reverse curl and uses gravity for extra resistance. This time the participant positions themselves in an incline position and repeats the protocol for the reverse curl, each time a set height is mastered for a set number or repetitions the participant further increases the height of the incline.



FEET TO CEILING – In this exercise the participant lies supine with their arms out straight over head and parallel with the ground (to build a stable base for the upper body) and their legs stretched out straight 90 degrees at the hips, the participant then performs a PPT pushing the lumbar region of the spine into the ground and raising the pelvis which pushes the feet in an upwards direction towards the ceiling. The participant must ensure that the movement is isolated to the pelvis with no hip flexion or hip extension, the objective here is to raise the feet vertically as high as possible without the legs moving forwards or backwards.



RA & hip flexors “ribs to pelvis while pelvis is stable”

SITUPS – In this exercise the participant lies supine, with both knees and hips at a 90 degree angle and their feet firmly anchored under something, the participant places their hands on their opposite shoulders and sits up bringing their elbows over their knees while maintaining posture (spine in the neutral position).



Progressions for this exercise are either holding weight to your chest or increasing the length of your body's lever. Progressions for increasing the length of your body's lever are

- 1) Hands on the opposite shoulders behind your head.
- 2) One hand on the opposite shoulder behind your head and one arm out straight.
- 3) Both arms out straight.
- 4) Both arms out straight holding a weight.

Remember, you must still be able to hold posture (spine kept in the neutral position) when you increase the length of your bodies lever

DECLINE SITUPS – This exercise can be used as a next progressing to situps and uses gravity for extra resistance instead of using weight or lengthening your body's lever. The participant this time positions themselves on an incline bench, in the decline position and repeats the protocol for the situp, each time a set height is mastered for a set number of repetitions, the participant further increases the height of the incline and if maximal height of the incline bench is achieved, the participant then has the option of adding weight or increasing the length of their body's lever.



FIT BALL SITUPS – In this exercise the participant sits on a fit ball, with both knees and hips at 90 degrees, the participant sits as high as possible on the ball, while still being able to keep balance throughout the exercise. The participant places their hands on their opposite shoulders and does a full situp (body upright) while maintaining posture (spine in the neutral position). Progressions for this exercise are either holding weight to your chest or increasing the length of your body's lever



Ribs and pelvis coming together at the same time

DOUBLE CRUNCH (RA & Hip Flexors) – In this exercise the participant lies supine with their arms stretched out straight over head (parallel with the ground) and their legs stretched out straight (parallel with the ground).

- 1) The participant slowly raises their arms and legs simultaneously keeping perfectly symmetrical.
- 2) The participant stops raising the legs once the legs are vertical (90 degrees to the body), with the arms also vertical (90 degrees to the body).
- 3) The participant then performs a curl up raising their shoulders off the ground, reaching up and touching their toes (legs must stay vertical).
- 4) After the participant touches their toes, their outstretched arms and legs slowly return to the ground to the start position.
- 5) This sequence is then repeated

The raising and lowering of the legs should take 3-5 seconds; touching the toes with the fingertips should be a 1-2 second pause. The timing of the movement should be that the arms and legs leave the floor at the same time, reach the vertical position (90 degrees to the body) at the same time and return back to the ground at the same time.



A more advanced version of this exercise is to perform a PPT pushing the feet to the ceiling simultaneously (legs must stay vertical) as the participant lifts their shoulders off the ground to touch their toes, at this point the flattened out lumbar section of the spine is the only part of the body still in contact with the ground.

A further progression to this exercise is to maintain a PPT for as long as possible when the legs are being lowered to the ground (the eccentric phase). If the participant can maintain a PPT while the feet are on the ground the participant then attempts to maintain a PPT through both the concentric and eccentric phases of the exercise.

In some instances participants wont be able to touch their toes due to a longer ratio of leg length to arm length and or tight hamstrings, if this is the case the participant reaches as high up the lower leg (shin) as possible, the height is then marked on their leg with a pen and the mark then becomes the gauge to work to.

DOUBLE CRUNCH (RA isolation exercise) variation 1– In this exercise the participant lies supine with their hands behind their head and their knees pulled close to their chest so the lower pelvis is just in contact with the ground, simultaneously the participant performs a PPT and a curl up bringing the pelvis and ribcage as close together as possible, at this point the pelvis and upper back are off the ground and the flattened out lumbar section of the spine is the only part of the body still in contact with the ground. This exercise is conducted with a 2-3 concentric contraction, a 1-2 second pause and a 2 second eccentric contraction.



DOUBLE CRUNCH (RA isolation exercise) variation 2– In this exercise the participant positions themselves as if they were doing a “Double Crunch (RA & Hip Flexors)”.

- 1) This time the start position is supine, with the legs vertical (90 degrees to the body) and arms also vertical (90 degrees to the body).
- 2) The participant then performs a PPT pushing the feet to the ceiling (legs must stay vertical) simultaneously as the participant lifts their shoulders off the ground to touch their toes, at this point the flattened out lumbar section of the spine is the only part of the body still in contact with the ground.
- 3) This sequence is repeated until participant loses form

This exercise should be conducted with a 2 second concentric contraction a 1-2 second pause and a 2 second eccentric contraction.

Once again in some instances participants wont be able to touch their toes due to a longer ratio of leg length to arm length and or tight hamstrings, if this is the case the participant reaches as high up the lower leg (shin) as possible, the height is then marked on their leg with a pen and the mark then becomes the gauge to work to.

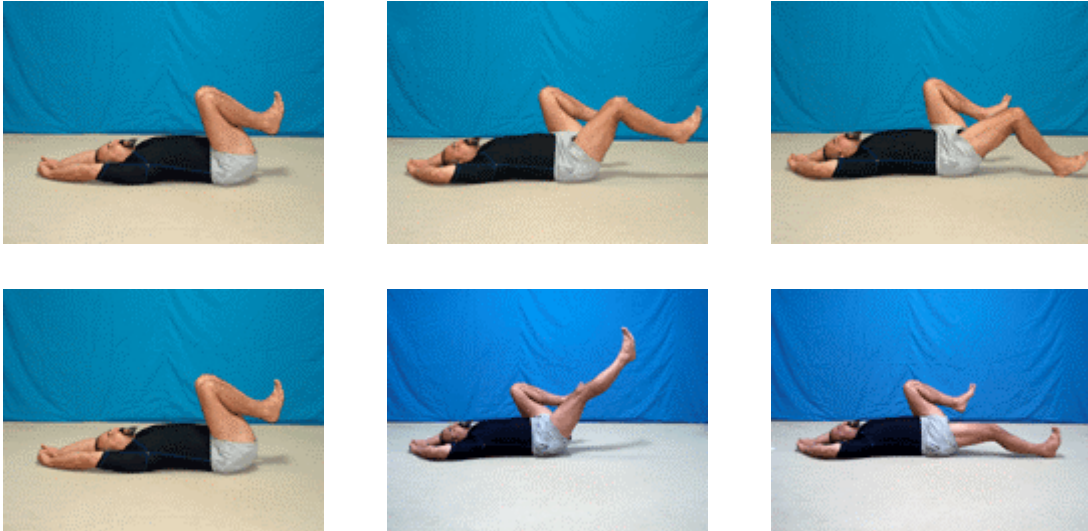


Advanced PPT

HEELTAPS – In this exercise the participant lies supine with their hands behind their head, their knees pulled close to their chest and their heels pulled close to their buttocks. The participant then performs a PPT then lowers the heel of one leg to the ground keeping the heel close to the buttocks. The objective here is to get the heel as close to the ground as possible while maintaining a PPT, if there is any loss of the PPT, the foot is lowered no further and the participant changes legs and repeats the movement, alternating legs for a set number of repetitions or until the participant loses form.



If the participant achieves heel to ground for a set number of repetitions the next progression is to move the heel further away from the buttocks (lengthening the lever), the heel is moved far enough away from the buttocks that the participant is again challenged. Each time a progression is achieved the heels are moved further away from the buttocks until the legs are locked out straight. The next progression from here is to stop alternating legs and use both legs together (locked out straight).



If this last progression is achieved, the participant maintains a PPT with their legs out straight (perpendicular to the floor) and raises and lowers their legs approximately 30 cm, slowly and controlled for a set number of repetitions with a 2-3 concentric and eccentric contraction.



If this last progression is achieved, the participant then holds a small DB between their ankles and repeats the 30-cm movements slowly and controlled while maintaining a PPT.



These advanced PPT exercises are an excellent way of gauging your abdominal strength.

RA versus the hip flexors

When performing exercises that involve RA and the hip flexors such as the “ribs to pelvis while pelvis is stable” group, the spine is kept in the neutral position throughout the exercise, which means there is no movement involving the ribcage and the pelvis. In these types of exercises RA works isometrically to stop hyperextension of the lower back as the hip flexors raise the upper body. Adding weight or increasing the length of the body’s lever increases the stress on RA to avoid hyperextension of the lower back. RA is also working in conjunction with other postural muscles holding the trunk stable and keeping the spine in neutral position throughout the exercise.

When performing exercises that involve the raising and lowering of the legs such as “double crunch (RA & hip flexors)” and “heel taps” and their progressions, RA is working isometrically to either stabilise the pelvis or perform a PPT. Increasing the length of the lever and or adding weight increases the stress on RA to stabilise the pelvis and or maintain the PPT

Exercise Guidelines

- 1) Slow the repetitions down, visualise the actual movements you are attempting around the pelvis and ribcage and feel each movement happen.
- 2) Gauge your repetitions for consistency and ensure quality otherwise participants will attempt to achieve ridiculous goals such as 100 half-ass repetitions.
- 3) Treat RA in the same manner as you would treat any other muscle group, if you are training the rest of your body with a 6RM training program, then chose an exercise/exercise progression for RA that would equate to a 6RM.
- 4) Don’t bring your chin to your chest when performing abdominal work, bringing your chin to your chest makes the exercise easier to perform by shortening your bodies lever, which inturn means loosing posture through the upper back and neck.
- 5) Levers are just as efficient as adding weight in some RA exercises so long as the participant can hold posture and keep the spine in the neutral position, when using levers there is the additional benefit of extra stability work for the core and surrounding trunk muscles.
- 6) When performing exercises where the upper body is stable and RA is pulling the pelvis to the ribcage (reverse curls & feet to ceiling), keep the arms out straight behind the head (parallel with the ground) and not along side the body. When placing the arms along side the body there is a tendency to push off the ground with the hands, making the exercise easier and taking some of the stress off RA.
- 7) On each exercise I have given a time frame for the concentric phase, the pause between the concentric and eccentric phases and the eccentric phase, these time frames I have found to be effective in ensuring quality, however these time frames can be manipulated to make the exercise more specific to your needs.

Training your upper & lower abbs

I'd like to finish this article by attempting to dispel what I consider to be one of the most famous training myths of all time. Can you specifically train/target the upper or the lower portion of RA?

My answer to this is can you train/target your upper or lower biceps or your upper or lower quapricep? The answer is no, to specifically train/target the upper or lower section of RA you would need to divide RA into two sections (an upper section and a lower section), between these two sections you would need to have some sort of a stable bony structure with a series of origins and insertions from the ribs to the stable bony structure in the centre of RA then from the stable bony structure in the centre of RA to the pubis.

Think of RA as a hinge right in the centre of the body, if the lower body is stable and the upper body is moving, you tend to feel it in the upper portion of RA (even though RA is pulling from both ends). If the upper body is stable and the lower body is moving, you tend to feel it in the lower portion of RA (even though RA is pulling from both ends). When performing exercises where the ribs and pelvis come together at the same time (double crunches and their variations) you tend to feel it at both ends of the muscle.

Conclusion

Treat RA the same way you would treat any other muscle or muscle group, choose appropriate exercises and exercise progressions to help you achieve your desired rep ranges and training goals and remember quality is the key to successful training.