

FITNESS & WELL-BEING

CRASH CORES

Gadgets and workout regimens promise washboard abs, but which one really works? Backed by studies, **Jeanette Wang** crunches the numbers

pilates double leg stretch



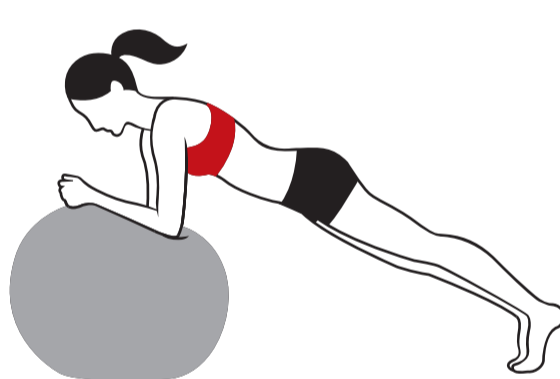
pilates hundred



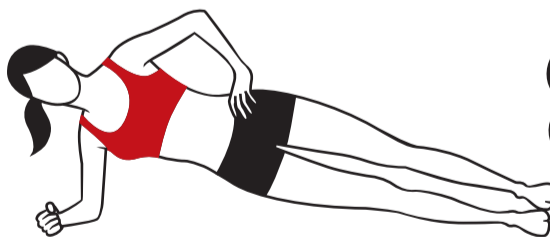
yoga boat



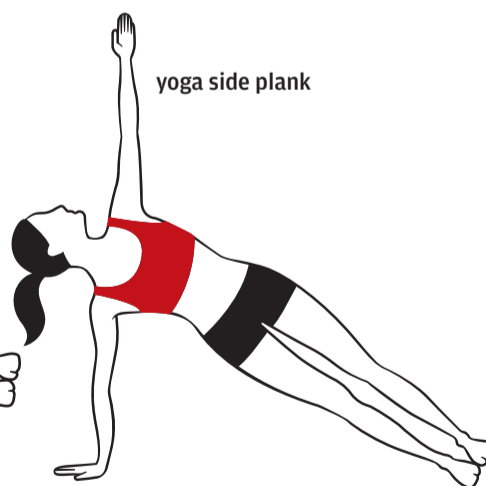
yoga dolphin plank on ball



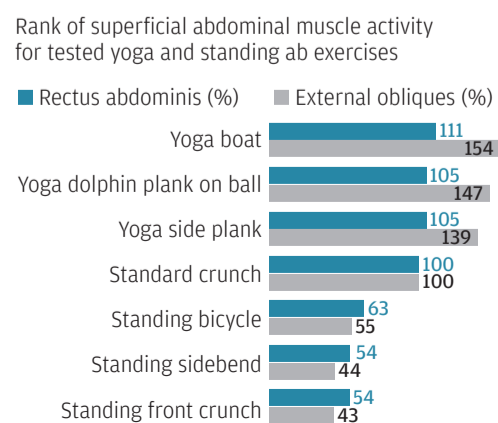
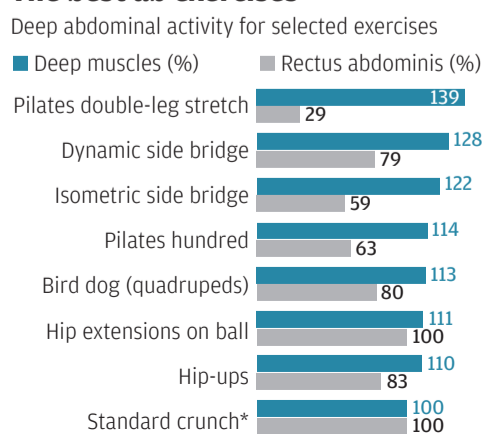
side bridge



yoga side plank



The best ab exercises



*Standard crunch expressed at a reference value of 100 per cent

If there's one thing that most people want – apart from money, success and happiness – it's six-pack abs. Not only attractive and sexy, it's seen as a sign of good health and fitness.

The obsession over a ripped midsection has spawned an entire multimillion-dollar industry that includes machines, pills, creams, fat-melting gadgets, fad diets and surgical procedures.

It has also inspired a whole encyclopaedia of exercises that claim to deliver the coveted washboard. But exactly which move will snag you that six-pack?

Researchers at Auburn University Montgomery in Alabama set out to determine the effectiveness of popular abdominal exercises using a test known as electromyography. The study is published in the July/August issue of the American College of Sports Medicine's *Health and Fitness Journal*.

Electromyography involves placing electrodes on the skin over the abdominal muscles. Electrical energy triggers the muscle to contract, and this contraction is captured, recorded and analysed. The greater the intensity of the electrical signal, the higher the degree of muscle activity.

It's not the first time such technology has been used. Since the 1990s, there has been a trend towards more evidence-based fitness programming, resulting in a stark change in ab exercises.

Sit-ups have long been struck off the list, due to the stresses they place on the spine and neck. The traditional crunch – a partial curl-up with unanchored feet – was also found to be ineffective, based on a 2001 study by researchers from San Diego State University's Biomechanics Lab that used electromyography.

The study, sponsored by the American Council on Exercise, put 30 healthy subjects aged 20 to 45 through 13 of the most common ab exercises, some involving equipment. The top three exercises were the bicycle manoeuvre, captain's chair and crunch on exercise ball.

This latest Auburn University study looked at the more popular ab exercises today, such as Pilates, yoga and standing abdominal manoeuvres. It also investigated the deeper abdominal muscles, known as "the core". These muscles are more important than the superficial ones – such as the rectus abdominis or "six-pack" – because they function like a corset, supporting and stabilising the lower trunk and spine.

In general, they found that Pilates and yoga-style exercises were effective for abdominal training and conditioning. The top exercises for producing increased deep

muscle activity with lower superficial muscle activity were the Pilates double-leg stretch, dynamic side bridge, isometric side bridge and Pilates hundred (see table).

The researchers highlight that the best moves are low on trunk flexion, with many being bridging or plank-style exercises. These place lower forces on the spine's shock-absorbing discs compared with flexion-oriented sit-ups and curls.

For the superficial ab muscles, three yoga moves – boat pose, side plank and dolphin plank on a stability ball – came out on top. The intensity of these poses ranged from 63 per cent to 96 per cent of maximum muscle output, meaning you get more bang for your buck for conditioning those abs.

Riding on the "crunch-free" ab exercise trend, standing

96%

Muscle output can reach this much by doing the boat pose, side plank and dolphin plank

exercises such as side bends and rotational movements have become very popular in recent times, the researchers note.

But the study shows that the standing front crunch, bicycle and side bend activated the ab muscles to a "significantly lower degree" – producing only about 20 per cent of maximum muscle output – than the standard crunch and yoga exercises.

The researchers caution that many standing ab exercises place several loads and forces on the shock-absorbing spinal discs, and could lead to wear and tear.

Ultimately, if you want that six-pack, just doing ab exercises isn't enough. A taut tummy comes from having a low body fat percentage. Eating a low-fat, nutritious diet helps.

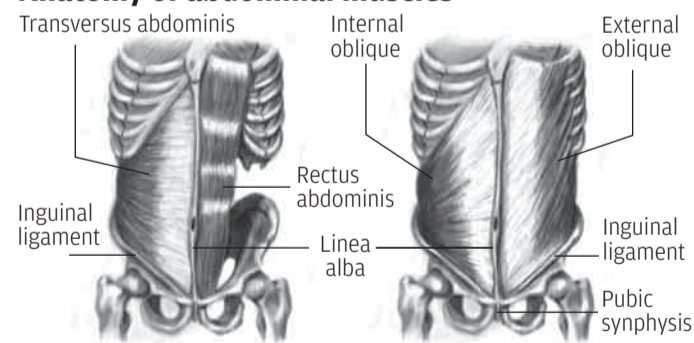
Ab exercises, however, have no significant effect on weight, fat percentage or other measures of body composition, according to a 2011 study in the *Journal of Strength & Conditioning Research*.

Another study of nearly 200 overweight sedentary adults published in 2011 in the *American Journal of Physiology* shows that your best bet for losing belly fat is aerobic exercise, such as running.

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The best moves are low on trunk flexion, many being bridging or plank-style exercises

Anatomy of abdominal muscles



Source: Human Kinetics

SCMP

Illustration: Kailz Lee

Anatomy of abs

The abdominal region is composed of several key muscles that contribute to spine stability in a variety of postures, providing the ability to flex, side bend, and rotate the trunk. These muscles also serve to protect the abdominal organs.

Rectus abdominis

The superficial muscle made famous in pop culture as the "six-pack". It flexes and rotates the trunk.

Transversus abdominis

The deepest of the three flat abdominal muscles. It provides core stabilisation and compresses the abdominal wall.

Obliques

These muscles rotate and sidebend the trunk. The external oblique is the most superficial muscle of the three flat abdominal muscles. The internal oblique also provides spine stability.

Source: *Core Assessment and Training* by Jason Brumitt (Human Kinetics, 2010)

HEALTH BITES

Melody modulates choir members' heart rate

Better health could be going for a song. A new study from the Sahlgrenska Academy at University of Gothenburg, published in the journal *Frontiers in Neuroscience*, shows how musical melody and structure influences the heart rate of choir members. "Singing regulates activity in the so-called vagus nerve,



which is involved in our emotional life and communication with others. Songs with long phrases achieve the same effect as breathing exercises in yoga. Through song we can exercise a certain control over mental states," explains Björn Vickhoff, lead author of the study.

Physical activity reorganises the brain

Researchers at Princeton University have uncovered another reason for the running high: exercise alters the brain so that its response to stress is reduced and anxiety is less likely to interfere with normal brain function. In the study in the *Journal of Neuroscience*, mice that exercised regularly and experienced a stressor –



exposure to cold water – showed a spike in the activity of neurons that shut off excitement in a brain region shown to regulate anxiety.

People's diets show a sugar-fat see-saw

We're often told to cut our intake of fat and sugar, but new research shows most people just can't do it. According to a study review of 53 scientific papers published in the journal *Critical Reviews in Food Science and Nutrition* there's an inverse association in the percentage of energy coming from fats and sugars, a phenomenon called the "sugar-fat see-saw". Dr Michele Sadler, who led the research team, says: "A key reason that we see this sugar-fat see-saw is likely to be because sources of sugars such as fruit, breakfast cereals and juices are low in fat, while sources of fat such as oils and meat products are low in sugar." Jeanette Wang

