Exercise and Abdominal Circumference Reduction

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T.I.M.S
Relationship between Changes of Visceral Fat and Total Fat Mass During Weight Reduction

Diet Restriction or Aerobic Exercise = Weight Reduction = ↓ Central Obesity
Aerobic Exercise or Diet Restriction

The Impact of Exercise Training Compared to Caloric Restriction on Hepatic and Peripheral Insulin Resistance in Obesity, J Clin Endocrinol Metab, November 2009.


Aerobic Exercise Without Weight Loss and Central Obesity

The Impact of Exercise Training Compared to Caloric Restriction on Hepatic and Peripheral Insulin Resistance in Obesity, J Clin Endocrinol Metab, November 2009.


Exercise for overweight or obesity, Cochrane Database Syst Rev, 2006.
Aerobic Exercise
Intensity
and
Central Obesity Reduction
Moderate Intensity (Aerobic Exercise):

40-60\%(MHR-RHR)+RHR

MHR=220-age
Aerobic Exercise Intensity

Influence of Exercise Intensity on Abdominal Fat and Adiponectin in Elderly Adults, Metabolic Syndrome and Related Disorders, 2009. (differences: yes)


Inactivity, exercise, and visceral fat, J Appl Physiol , 2005. (differences: no)

Aerobic Exercise vs. Resistance Exercise and Central Obesity
AT was more effective than RT at improving visceral fat, total and subcutaneous abdominal fat and trended toward a greater reduction in liver fat score. RT resulted in a decrease in subcutaneous abdominal fat but did not significantly improve the other variables.

The effects of AT/RT were statistically indistinguishable from the effects of AT.

Effects of aerobic vs. resistance training on visceral and liver fat stores, liver enzymes, and insulin resistance by HOMA in overweight adults from STRRIDE AT/RT, Am J Physiol Endocrinol Metab, 2011.

These data show that, for overweight and obese individuals who want to reduce measures of visceral fat a moderate amount of aerobic exercise is the most time-efficient and effective exercise mode.

Effects of aerobic vs. resistance training on visceral and liver fat stores, liver enzymes, and insulin resistance by HOMA in overweight adults from STRRIDE AT/RT, Am J Physiol Endocrinol Metab, 2011.

In my opinion, there is something that may be best described as a “scotoma” in research on various training methodologies; if we don’t consider the extremely wide range of different exercise executions, we risk underestimating the importance and the effects of the different kinds of exercise.

Calorie restriction diets have been shown to reduce RMR by as much as 30%, decrease FFM, and actually contribute to gains in adipose tissue subsequent to the intervention.

Lean skeletal muscle is known to have an average daily resting energy expenditure of approximately 17.6 kcal/kg.
Several studies have examined the effects of RET on body composition and RMR and have found that RET does in fact promote increases in both FFM and RMR, as well as decreases in total FM, with the preferential mobilization of VAT and SAT in the abdominal region.
Overall, the findings of these studies offer strong support for the use of RET as a means to reduce total and regional adipose tissue as well as increase FFM and hence RMR.


Resistance Training Is an Effective Tool against Metabolic and Frailty Syndromes, Advances in Preventive Medicine, 2011, review.
Increases in muscular mass and strength can contribute to longer EET sessions, thereby allowing for greater calorie expenditure and further promoting weight loss and weight maintenance.

The American Heart Association, the American College of Sports Medicine, and the American Association of Cardiovascular and Pulmonary Rehabilitation, now recommend RET as part of a comprehensive exercise program designed for the prevention of cardiovascular disease in individuals at high risk and the rehabilitation of those with established heart disease.

Abdominal Exercise
The abdominal wall is made up of several muscles: the rectus abdominis, transversus abdominis, internal oblique, external oblique, and the aponeurosis.
The abdominal exercise group (AG) (n=12) performed 7 abdominal exercises, for 2 sets of 10 repetitions, on 5 d·wk(-1) for 6 weeks. The control group (CG) (n=12) received no intervention, and all participants maintained an isocaloric diet throughout the study.
There was no significant effect of abdominal exercises on body weight, body fat percentage, abdominal circumference, abdominal skinfold and suprailiac skinfold measurements. The AG performed significantly greater amount of curl-up repetitions compared to the CG on the posttest.
Bent-knee and extended-knee sit-up exercises have been shown to be effective in activating the rectus abdominis and internal and external oblique musculature.

The crunch exercise has been recommended in place of sit-up exercises.
Nontraditional Abdominal Exercises

(A) Ab Revolutionizer double crunch, (B) Ab Revolutionizer oblique crunch

(C) Ab Revolutionizer reverse crunch, (D) Ab Revolutionizer reverse crunch with weights.

In general, all exercise variations of the Ab Revolutionizer device produced abdominal muscle activity similar to that produced by the crunch, bent-knee sit-up, and reverse crunch flat exercises.

Lower rectus abdominis muscle EMG activity
External oblique muscle EMG activity
Internal oblique muscle EMG activity (and Transverse abdominis)
<table>
<thead>
<tr>
<th>RANKING</th>
<th>EXERCISE</th>
<th>MEAN % OF ACTIVITY</th>
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<tbody>
<tr>
<td>1</td>
<td>Bicycle Maneuver</td>
<td>248</td>
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<tr>
<td>2</td>
<td>Captain's Chair</td>
<td>212</td>
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<tr>
<td>3</td>
<td>Exercise Ball</td>
<td>139</td>
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<tr>
<td>4</td>
<td>Vertical Leg Crunch</td>
<td>129</td>
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<tr>
<td>5</td>
<td>Torso Track</td>
<td>127</td>
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<tr>
<td>6</td>
<td>Long Arm Crunch</td>
<td>119</td>
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<tr>
<td>7</td>
<td>Reverse Crunch</td>
<td>109</td>
</tr>
<tr>
<td>8</td>
<td>Crunch with Heel Push</td>
<td>107</td>
</tr>
<tr>
<td>9</td>
<td>Ab Roller</td>
<td>105</td>
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<tr>
<td>10</td>
<td>Hover</td>
<td>100</td>
</tr>
<tr>
<td>11</td>
<td>Traditional Crunch</td>
<td>100</td>
</tr>
<tr>
<td>12</td>
<td>Exercise Tubing Pull</td>
<td>92</td>
</tr>
<tr>
<td>13</td>
<td>Ab Rocker</td>
<td>21</td>
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ACE-COMMISSIONED STUDY, San Diego State University Biomechanics Lab, 2001
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<td>Ab Rocker</td>
<td>74</td>
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ACE-COMMISSIONED STUDY, San Diego State University Biomechanics Lab, 2001
Safety of Abdominal Exercises
High challenge-to-compression ratio

Crunch with feet anchored
Crunch with feet free
Bicycle crunch
Hanging straight leg raise

High challenge
higher compression

Straight-leg sit-up
Bent-leg sit-up

Low challenge-to-compression ratio (not recommended!)

Supine straight-leg raise
Supine bent-leg raise
Static cross-knee crunch
Hanging bent-leg raise

Low compression
lower challenge

Crunch with feet anchored
Crunch with feet free

Low Back Loads Over a Variety of Abdominal Exercise, Official Journal of the American College of Sports Medicine, 1996
Hula Hooping
Effective Workout Hooping or Child’s Play? By Jordan Holthusen, M.S., John Porcari, Ph.D., Carl Foster, Ph.D., And Scott Doberstein, M.S., www.ACEfitness.org
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<table>
<thead>
<tr>
<th>Study</th>
<th>% HRmax</th>
<th>( \dot{V}O_2 ) (ml/kg/min)</th>
<th>Kcal/min</th>
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</thead>
<tbody>
<tr>
<td>Hooping</td>
<td>84 ± 9.0</td>
<td>20.6 ± 3.31</td>
<td>7.0 ± 1.44</td>
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<tr>
<td>Advanced Pilates</td>
<td>62 ± 4.0</td>
<td>17.3 ± 1.40</td>
<td>5.5 ± 0.97</td>
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<tr>
<td>Power Yoga</td>
<td>62 ± 5.4</td>
<td>18.7 ± 1.30</td>
<td>5.9 ± 1.03</td>
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<tr>
<td>Cardio Kickboxing</td>
<td>86 ± 0.0</td>
<td>25.7 ± 2.65</td>
<td>8.1 ± 1.24</td>
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<tr>
<td>Step Aerobics</td>
<td>75 ± 4.7</td>
<td>23.4 ± 2.10</td>
<td>5.9 ± 0.86</td>
</tr>
</tbody>
</table>
Development of a perirenal hematoma after hula-hooping: A case report

Exercise-induced acute spinal subdural hematoma: A case report

Which one are you?

Thank you!