

Strengthen your players' core to prevent injuries

Soccer-specific training for abdominal muscles
by **Christoph Anrich**, teacher and youth coach

Well-defined abdominal muscles are often seen as the true measure of fitness. A "six-pack" signifies an attractive physical image, and according to the literature, the abs are one of the muscle groups that tend to be weak. These are the reasons why the abs are so comprehensively covered in every workout program and fitness book. Many writers give tips on effective training, and so many fitness experts have written about the abdominal muscles that it's impossible to keep track of it all.

One result is that ab training is done sloppily or not at all, even though the abdominal muscles need extra attention to meet the demands of modern soccer. Christoph Anrich gives them that attention in this article, reevaluating some old prejudices and providing exercises for a range of ability levels.

What do the exercises do?

Functional training provides a perspective for assessing whether exercises actually achieve the desired effect and which muscle groups they activate. It allows us to distinguish between "good" and "bad" exercises. Muscle paths are traced from beginning to end, and exercises are classified accordingly: Does the exercise train the desired muscles at all? Which other muscle groups does it train? For example, does a strengthening exercise for the abdominals activate the groin muscles as well? What are the health risks of bad exercises?

Analysis

Functional training provides valid results. However, concepts from physical therapy and rehabilitation also have a strong influence (too strong, in my opinion) on everyday soccer training. It has become impossible to escape the impression that playing soccer itself constitutes a major health risk! And functional

concerns are greatly exaggerated. For instance, even a slight hyperextension of the spine is frowned upon, even though this occurs normally during throw-ins and headers. The structure of the spine allows a range of motion of about 250 degrees. If you want to avoid health problems, you have to avoid overstressing the spine or any part of it. However, it's also important to stabilize the spine through its entire range of motion with strength training. As much as possible, this range must be preserved so soccer-specific movement sequences can be performed fully and completely. A wind-up for a throw-in or header should not be problematic. These actions should not cause pain unless prior injuries exist.

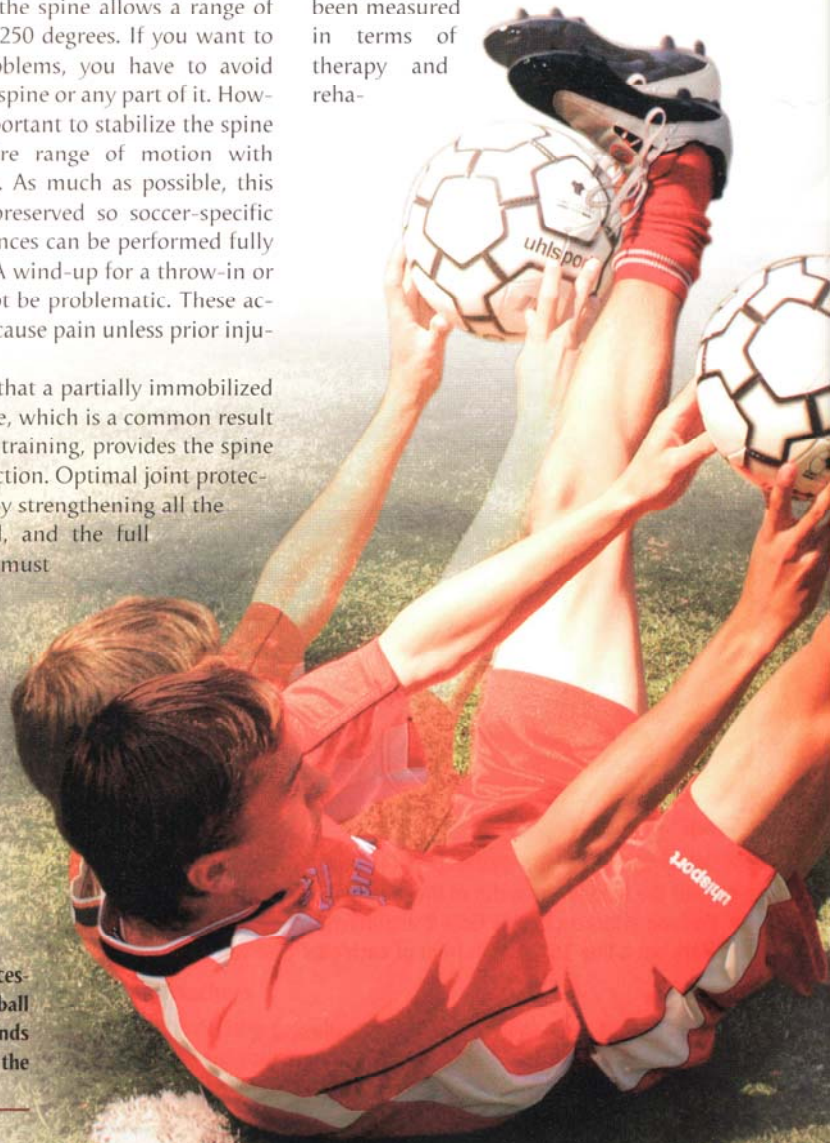
It's also not true that a partially immobilized torso musculature, which is a common result of static strength training, provides the spine with better protection. Optimal joint protection is achieved by strengthening all the muscles involved, and the full range of motion must be preserved so that passive structures are strengthened as well. This is one of the reasons why, as a general rule, the groin muscles should not be

Simple training accessories such as the ball can take players' minds off the intensity of the exercise.

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ignored and should be integrated into both mobility and strength training.

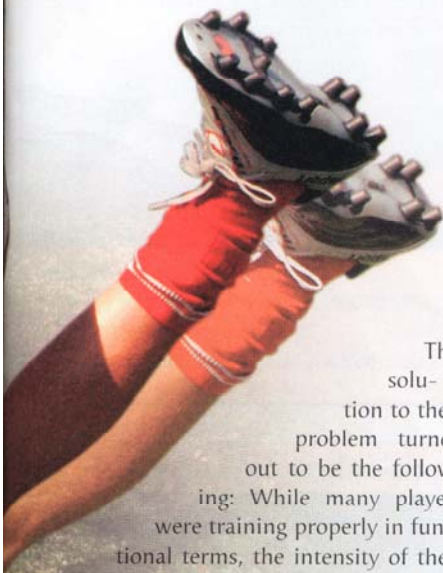
In the past, it seems, the value of athletic exercise has often been measured in terms of therapy and reha-



bilitation rather than anatomy and the qualities required for match play. Of course it is still true that anyone who suffers from chronic pain needs expert care and a well-balanced rehabilitation program. But that's not the job of a soccer coach! To be completely clear: This article is not about reintegrating an injured player into your training program.

Objectives

The primary objective is to achieve the stability required to play soccer. Abdominal muscle training should prevent injuries and improve performance. To do so, it must match the intensity levels encountered while playing the game. An example: Between 2000 and 2003 I examined approximately 250 youth players (U16 and U18) from the German national team and other upper-level leagues. About 50 percent of these players suffered from back problems. I had not expected such a high proportion of players with problems, because most of them were doing regular strength training and abdominal training both at practice and on their own.



The solution to their problem turned out to be the following: While many players were training properly in functional terms, the intensity of their training did not correspond to the intensity of their games. Fifty to 80 repetitions are enough to train power reserves and the physique, but they don't do much to stabilize the joints!

Raising the intensity level

Intensity and power requirements go up as players graduate to the U16 level. After the "golden age of learning" between ages 10 and 14, young adults need to master technical movement sequences. Explosive sprints and powerful moves in all situations become necessary as well. Unfortunately, most players

do not have the strength to meet these demands on their coordination and condition, and the stability of active and passive structures suffers as a result. Exercises to stabilize the joints for the increased workload are an essential part of advanced training. For players at this age level, the usual exercises for strengthening the abdominal muscles are not enough. The intensity of strength training must be increased accordingly and individually tailored so that joint and back problems never occur in the first place. But be careful: Players who have never done functional strength training must be brought up to speed gradually, or else they risk overexerting themselves.

The danger of overexertion is minimal in exercises using the body's own weight and simple training accessories (such as the ball). Still, if the intensity is set too high, these exercises can become extremely uncomfortable and even cause pain. Even though they are not necessarily hazardous to health, their "side effects" quickly ruin players' enjoyment of training.

The importance of the abdominal muscles in soccer

- Stabilization of the pelvic axis: The abdominal muscles help stabilize the spine. With training, the negative effects of swayback can be reversed.
- The abdominal muscles are involved in all movements of the torso: Better mobility is an advantage for 1 v. 1 situations and ball control as well as technical sequences (e.g. headers and throw-ins).
- Well-trained abdominal muscles improve performance: They enable players to maintain proper position during takeoff power-intensive movements (especially passing and shooting) and 1 v. 1 play.
- Prevention: Lower back pain and many leg muscle injuries are caused in part by weak torso muscles; this can be prevented. Good abdominal muscles provide the necessary torso stability to absorb the shock of collisions and landings.
- Rehabilitation: Together with the strengthening of other muscles (e.g. back muscles), abdominal strengthening can have a positive impact on posture. Exertion levels should be controlled during rehabilitation so that joint structures such as ligaments and capsules have time to adapt to increased demands.

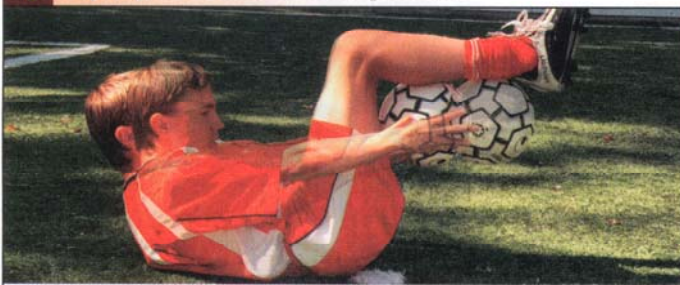
Tips for training

- Work on the abdominal muscles regularly (two to four times per week).

- Pay attention to functionality. Some exercises train the groin muscles more than the abdominals.
- Train slowly. Bouncing can cause muscles to tighten to protect themselves.
- Exhale on each exertion. Ideally, your breathing should maintain a rhythm throughout training. Avoid tensing your diaphragm.
- Vary your exercises. All the parts of the abdominal musculature can be easily trained without weight machines or other accessories. Ab training accessories in particular promise great results but tend to be expensive and eventually become boring.
- When doing exercises lying on your back, your gaze should be directed forward and upward. Never pull on your head or neck, and don't tuck your chin. Only use your abdominal muscles to raise your shoulders and head.
- You can't sprint without good groin muscles! Involving the groin muscles is not necessarily harmful and can be functionally desirable. Be sure to avoid developing a swayback, though.
- Exercises in which the upper body is raised from the floor to a vertical position are not appropriate for beginners because the groin muscles tend to be recruited as well. This can lead to swayback, especially in relatively untrained players, which in turn puts excessive strain on the passive structures of the spine.
- Before increasing the intensity of an exercise, hold the final position of the less intense version for two to four seconds.
- If exercises are too intense, players will execute them incorrectly, which can lead to problems.
- The farther the hands and arms (or legs) are from the center of the body, the more difficult the exercise is.
- If the neck muscles cause problems during training, choose a less strenuous version of the exercise. Sometimes it's a good idea to strengthen the neck muscles as well.
- Training the transversal abdominal muscles typically activates the oblique muscles as well. Isolating one group is generally not possible.
- To avoid developing a pronounced swayback, do a functional test first: Extend your legs and slowly lower them toward the ground. If a partner has trouble pulling his hand out from under your lower back, it's a sign of strong abdominal muscles.
- Using a ball or other accessory (resistance band, goalpost) helps with motivation. Players who are concentrating on holding a ball often don't realize how intense the exercise really is; they are distracted from the physical exertion while avoiding overexertion. Accessories can also help make exercises more focused.

ABDOMINAL STRENGTHENING EXERCISES

1 Lying on back with legs bent



Execution

- Lie on your back with legs bent 90 degrees at the hips and knees.
- Hold a ball under your knees and slowly push it along your calves toward your heels.
- Raise your head and shoulders as you do so.

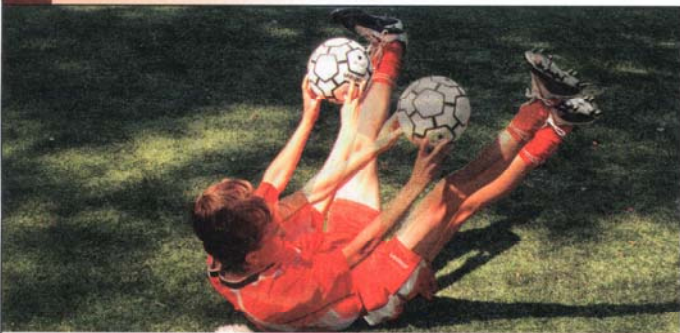
Higher intensity



Execution

- Starting position is the same as at left, except the ball is held overhead with arms extended.
- Raise the ball up and to the left or right, raising your head and shoulders as you do so. Don't tuck in your chin; your forehead should follow the ball.

2 Lying on back with legs extended



Execution

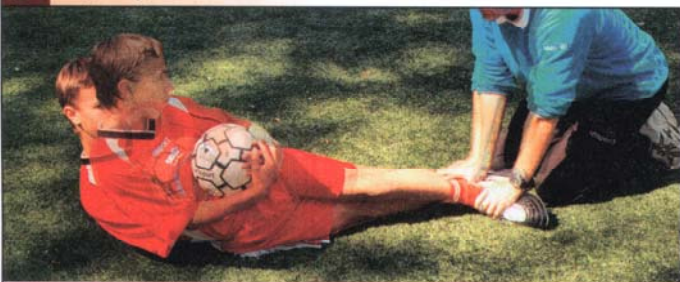
- Lie on your back with legs spread and extended straight up.
- Raise a ball to the left, right and middle.
- Raise your head and shoulders as you do so.

Higher intensity

Execution

- Execution is the same as at left, except you also spread your legs apart with a resistance band around your knees.

3 Lying on side



Execution

- Lie on your side and have someone hold your feet on the ground.
- Hold a ball in your hands in front of your stomach.
- Raise your upper body up to the side as far as you can, then lower it.

Higher intensity



Execution

- Starting position is the same as at left, except the ball is held overhead with arms extended.
- Raise your upper body up to the side, then rotate to face upward.

4 Lying on back and holding ball 1



Execution

- Lie on your back with legs bent 90 degrees at the hips and knees and a ball held between your feet.
- Form a "U" with your arms and raise your head and shoulders up and forward.

Higher intensity



Execution

- Starting position is the same as at left, except an additional ball is held overhead with arms extended.
- Raise your arms, head and shoulders up and forward.

5 Lying on back and holding ball 2



Execution

- Lie on your back with legs extended straight up.
- Extend your arms overhead.
- Raise your arms, head and shoulders up and forward.

Higher intensity



Execution

- Starting position is the same as at left, except an additional ball is held overhead with arms extended.
- Raise your arms, head and shoulders up and forward.

6 Lying on back and raising hips



Execution

- Lie on your back and hold on to a post or a partner's ankles.
- Bend your legs 90 degrees at the hips and knees.
- Raise your hips straight up as far as you can. Do not roll your hips up toward your head.

Higher intensity



Execution

- Starting position and execution are the same as at left, except a ball is held between the feet.

ABDOMINAL STRENGTHENING EXERCISES

7 Lying on back with heels planted 1



Execution

- Lie on your back and plant your heels on the ground so your knees are bent at approximately 90 degrees.
- Cross your arms on top of your torso.
- Slowly raise your head and shoulders while keeping your lower back on the ground (see test under "Tips for training").

Higher intensity



Execution

- Starting position and execution are the same as at left, except one ball is held between the knees and another is held overhead with arms extended.

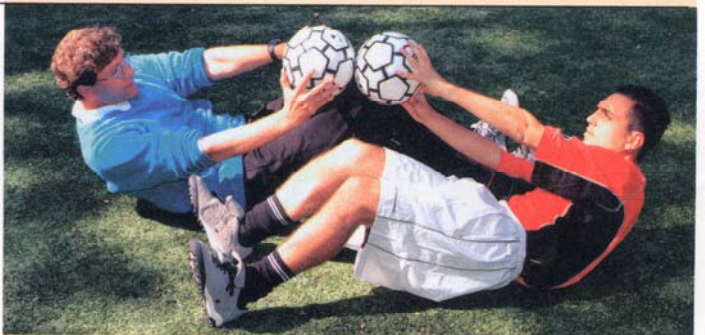
8 Lying on back with heels planted 2



Execution

- Two players lie side by side with heels planted as above, feet pointing in opposite directions and knees lined up. They pass a ball around their knees in a figure-eight pattern while raising their heads and shoulders. Switch directions afterwards.

Higher intensity



Execution

- Execution is the same as at left, except players hold one ball each and press them together in the middle.
- Switch sides afterwards.

9 Lying on back with legs raised



Execution

- Partners hold balls between the insides of their feet and pass their feet around each other, raising their heads and shoulders as they do so.
- Note: Make sure the balls stay above stomach level at all times.

Higher intensity



Execution

- Starting position is the same as at left, except partners cross their arms above their heads and press the outsides of their feet together.
- Switch sides afterwards.

10 Hanging



Execution

- Hang from a bar (e.g. a goal crossbar), slowly raise your thighs toward your upper body and then slowly lower them.

Higher intensity



Execution

- Starting position is the same as at left, except a ball is held between the feet.
- After raising your thighs, extend your feet forward.

11 On all fours



Execution

- Get on your hands and knees with fingers pointing slightly inward and elbows slightly bent.
- Raise your knees slightly off the ground.

Higher intensity



Execution

- Starting position and execution are the same as at left, except your hands are resting on a ball.

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