

Strength and Conditioning for Table Tennis

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Most people in the USA are surprised by the fact that table tennis is a very physically demanding sport. When general physical fitness tests for all sports are done in developed Table Tennis countries, Table Tennis is frequently considered to have the best overall fit athletes. To create a strength and conditioning program for table tennis, we have to look at what all levels of athletes need in terms of physical requirements.

Typically a player has 0.5 seconds to react to a ball hit at 60 MPH from a distance of nine feet. The ball can also have up to 9000 RPM of spin, and the table is five feet wide. In a race of 100 meter it is speed. Table tennis is much faster than that, dealing with quickness and explosiveness similar to combat. To react fast and remain in balance, you need to be low, lean forward, with your knees bent to about 90 degrees depending on your height. Quick lateral movements are used almost exclusively with one step back and forth for balls close to the net. A defending player is doing much more work inwards and outwards compared to an offensive player and the rallies are longer. A close match in seven games takes about 45 minutes. Due to the physical efforts required, ITTF rules state that in a tournament no player should be required to play more than four matches in a day. USA tournaments play more matches than anywhere else in the world, sometimes up to 15 matches in a day. The athlete's level of play makes a huge difference in terms of physical output. Normally players below 1500 love to play all day long, because they do not expend much energy. At 1500-2000 players use more energy but not even close to the higher-level players. At 2000-2250 it becomes more physical, and over 2250 physical preparation is essential. It is important for the tournament organizers to understand this as well. In USA high-level players are frequently treated the same in terms of number of scheduled matches in a day as intermediate-level players. An over-2400 player should not have more than four tough seven-games matches in a day. A player below 2000 can easily play 10 matches in a day.

So how to properly prepare for these physical challenges?

For fastest improvement each athlete has to carefully evaluate what his/her training time should be used for.

- 1) **Below 1500:** Technical work at the table is the best use of time. That level has not yet acquired good footwork, the skills to consistently hit the ball hard, how to read spin, and therefore will not expend much energy, and should focus the majority of the time on technical development. If you are stuck at this level get a coach to improve your technique. If you cannot return a serve why waste time on physical training?
- 2) **1500-2000:** Physical fitness starts to be important. Your fitness might limit you to what you can do technically. Start with aerobic conditioning. You should do aerobic workouts from 20 min – 40 min 1-2 times week, like swimming, cycling, walking, or running. Running is preferred but also the most demanding. The body is not designed to run slow. You need to run at least at a 10-minute mile (6 MPH) pace, to do somewhat a full stride. At a slower pace the body will be susceptible to injuries from incorrect running techniques. If you cannot run at

that pace, walking is a good alternative. Lighter calisthenics like jumps, push-ups, and crunches are also good. Each set needs to be at least 15 repetitions; otherwise it is too easy or heavy. When you use your own body weight as a measure of resistance it is often conflicted with the notion that it is easier than using weights. For example push-ups can be compared to bench press. At 200 pounds, a push-up is the equivalency of doing a 160 lbs. bench press lift. If you are overweight, using your body weight will almost always be too heavy. Using a weighted bar can make it easier. For a younger and smaller but fit athlete it might be easy to use his/her own body weight.

- 3) **2000-2250:** Weight training starts to be more important. One of the most important effects of proper weight training, besides the obvious in strength, is increased flexibility, increased explosiveness, and increased speed. The old notion that weight training makes you slow is today clearly demonstrated erroneous by the large sprinters and football player who are faster than ever. Weight training once/week, where you work your whole body, will help your game. This is assuming you play table tennis three times week. The most important muscle group are the leg muscles. Find a personal trainer who can show you how to correctly do a back squat, meaning having a barbell behind your neck and bend down. For the first six months go to a 100 degree knee angle, after that you go down lower to the ideal table tennis angle of 90 degrees. Other important muscle groups are upper and lower back, abdominal, rotary cuff, and chest. Unimportant muscle groups are forearms, trapezius, lateral deltoids. Secondary muscle groups are biceps and triceps. Your whole workout should be 24 sets and take about an hour.

An example of a full body muscle group split for table tennis is:

Legs 7 sets, Chest 3, Back 3, Shoulders 3, Lower Back 2, Abs 3, Calves 3.

Strength training for sports is very different than bodybuilding. Sports need to have as much of the whole body involved as possible and use multi-joint exercises. An excellent exercise is squats. The obvious work is on the legs, but you also work on gluts, lower back, mid back, and a little bit of calves. In general athletes working out to increase strength should avoid machines like "leg extension" and "leg curls." That motion is never used on the table. Free weights is much more advantageous. Free weights are more difficult technically to do, which improves balance. Use dumbbells for chest and shoulders workouts. Always measure your weight with your weak side first, to give that side a chance to catch up, and do the same reps on the stronger side. If your strength is unbalanced so will you be at the table, and it is an increased injury risk. To start with you should use one exercise per upper body part. Almost all players have one weak leg. The legwork should emphasize hard work on the weak leg to create balance in your movements at the table.

- 4) **Over 2250:** Aerobic and weight training is now very important. Season planning is essential. It takes about six months of training to create a peak performance. You divide that in four parts:
- **Off-season** has the goal of building muscle mass and basic aerobic conditioning for about ten weeks.
 - **Pre-season** is redefining the strength and conditioning to speed and explosiveness for about eight weeks.
 - **In-season** uses more time on the table and only maintains what you have in strength for about four weeks.

- **Transition period** is an active rest period with a minimum loss of conditioning for about two weeks.

OFF-SEASON

An example of a 2-day/week table tennis strength routine:

Day 1: Legs 10 sets, Calves 6, Abs 6.

Day 2: Chest 5 sets, Back 5, Shoulder 5, Lower back 3, Arms 4.

This should be your routine in the Off and Pre-season for the first year. The weight should be measured by how many maximum repetitions can be done before you have to stop. The first set should be 15 reps, then 10-12 reps with more weights. The aerobic training should be done the same number of days as weights. Run from 20 minutes to one hour at one speed with a pulse of about 70-80% of your maximum heart rate.

The second year for players over 2400 (and over 17 years old), do weight training three times/week. This assumes a five sessions a week table tennis load together with the three sessions of weight training/week and three sessions of aerobic training a week. You work each body part only once a week. The rest time is crucial in strength training, and technical training will also work on those muscle groups, so be careful of over-training.

An example of a three-day/week table tennis strength routine:

Day 1: Quadriceps & Hamstrings 10 sets, Calves 6, Abs 4.

Day 2: Chest 6 sets, Shoulders 6, Triceps 3, Lower back 3, Abs 4.

Day 3: Back 6 sets, Biceps 3, Abs 4, Gluts 5.

The most common injuries for table tennis athletes are in shoulders, lats, and lower back. Back injuries can come from an imbalance in their upper body from having a weak non-playing arm side or in-balance in “starting” to “breaking” muscles. We have muscles that start the motions. On the forehand they are the chest, biceps, and quadriceps. Then we have muscles that break the motion, which on the forehand are: rear deltoids, lats, triceps and mid gluts in the hips. If you play well and have been able to hit the ball harder than normal in a tournament then those are the muscles that are sore. If you had to work hard with longer rallies at your normal level, many times you feel sore in your legs and gluts.

Pre-Season

This training period emphasizes development of speed and explosiveness. In the weight routine you put in about 50% of explosive sets for each muscle group, which means slow at the negative movement and maximum speed at the positive movement of the exercise. The weight needs to be lowered to 50% of your 1 rep maximum and 10 repetitions per set. Example for bench press: You go down slow towards your chest, and fast up to straight arms. In the aerobic training you start interval training that resembles the times we have in table tennis. An 11-point game takes an average of 3-4 minutes, which is an equivalent time that most advanced players can run ½ mile. Then a rest time of one minute and repeat that 3-7 times, resembling table tennis rest-times and games.

In-Season

This training period is when important tournaments are taking place. Do both whole body

weight training and aerobic training once a week each. The technical work is more demanding so most of your energy is used there. The goal is to maintain what you built up during the season.

Transition Period

Two weeks twice a year of active rest. Play table tennis once a week maximum, and run easy for 20 minutes three times/week. Play other sports once a week. Often athletes take a complete rest and lose almost all their fitness, and when they start the next season they lose a lot of valuable training time.

To execute the correct movements and techniques on a high level in table tennis it is very physically demanding. Often experienced players focus more time on their fitness compared to earlier in their careers. Eric Owens' preparation when he won the 2001 Nationals in Men's Singles and Doubles was mainly weight training and much less time on the table compared to previous years. Werner Schlager trains table tennis in his off seasons only 3 times/week, but spends time with physical training every day. Europe cannot copy the high-level national Chinese training environment with professional practice partners and hours of multi-ball each day, but they keep up with more advanced physical training preparation. The Chinese now realize that and have started a new National Strength and Conditioning program in all sports. In the future the Chinese, with an improved physical training routine, might be invincible.