

BADMINTON

Badminton is not a gender or age specific sport, meaning men and woman of all ages can compete against each other. Due to the nature of the game, universal health benefits associated with badminton include an increase in agility, flexibility, power/strength, speed, stamina and reaction time. Badminton can act as a full body workout, as the movement of the racquet exercises the upper torso. It also works the core and lower body through a player's movement around the court. As badminton can be played in pairs, it is an excellent way to develop communication skills and learn to work effectively with other people.



The small area of the badminton court in comparison to other racquet sports such as tennis and squash results in maximum speed being difficult to reach, however, the small space also creates a fast paced game environment. Badminton can be considered an intermittent activity with short bursts of activity followed by periods of inactivity. For game purposes, the coach/volunteer may also want to consider developing badminton teams with patients of different chronic diseases and/or different functional abilities.

Warm up (10 minutes)

At low intensities, the warm up can include:

- Walking or brisk walking for 2-3 minutes x 2, with 2 minutes light walking break
- Arm and wrist cycles with the racket
- Extended arm small circles at the shoulder level
- Trunk rotations with hands on the waist
- Jogging on the spot (based on the level of the patient)

Main Session (45 minutes)

Flexibility

Flexibility exercises are used to increase the range of motion of a joint. Stretching up until the range of motion is crucial to preventing injury and enhancing muscular performance and therefore should form part of any player's training. Stretching will help reduce the risk of injury when the body is placed in awkward, unfamiliar positions. Stretching can also be used to improve footwork and agility, which are two essential skills of the game.

During the badminton training, as highlighted in table 1, the exercises can be performed at the start and the end of the training session by any patient with a chronic disease:

Table 1: Exercises Based on a Badminton Session for Patients with Chronic Disease

Static stretches	All round body stretches: hamstrings, quads, triceps, shoulders.
Movement stretches	Walking combined with arm stretches – single arm rotation and double arm rotation, 20m (22yd)
Dynamic stretches (for progression)	Walking lunges x 6, 20m (22yd), walking lunges with torso twist x 6, 20m (22yd), backward lunges x 6, 20m (22yd)
Dynamic stretches (for progression)	Jogging, heel butt kicks 20m (22yd), knee raises x 20m (22yd), hurdle action 20m (22yd), knee to shoulder twists

Static stretching generally means a slow stretching effort in which the patient reaches a point of a light stretching sensation. The patient should then hold the position for about 20-30 seconds, repeated two or three times.

Static stretches that are advised to be part of a player's (and in this occasion a patient's) regime: Shoulder and chest stretch, arm and shoulder stretch, hamstring stretch, hip and inner thigh stretch, groin stretch, upper body twist and stretch, hip and quads stretch, calf and Achilles stretch.

Cardiorespiratory Fitness

Although fitness can be improved whilst playing the sport as practise, interval training would mimic badminton play and is considered the best type of specific fitness training for the sport as interval training is the most effective way to increase anaerobic and aerobic fitness. Equipment machinery such as treadmills, rowing machines, stationary bikes and steppers may be used for interval training.

Interval training duplicates the style of discontinuous activity associated with badminton and usually involves brisk walking and/or running (according to the patients' functional ability) intervals followed by periods of rest. Most research indicates that these intervals are best accomplished with a work: rest ratio of 1:2.

Table 2 illustrates examples of interval training on a treadmill which can be used for any patient. Please note that the following intensities can be further upgraded once the patient improves their level of fitness. Small increments should be utilised at all times.

Table 2: Interval Training for patients with chronic disease based on Badminton

Activity	Duration	Speed	Rest Interval
Walk	3 minutes	2.0 mph (3.2km/h)	None
Brisk Walk	1 mile	2.5 mph (4.0km/h)	2 minutes
Brisk Walk	1 minute	3.0 mph (4.8km/h)	2 minutes
Brisk Walk	1 minute	3.0 mph (4.8km.h)	2 minutes
Brisk Walk	1 minute	3.0 mph (4.8km/h)	2 minutes
Brisk Walk/Jogging	1 minute	3.5 mph (5.6km/h)	2 minutes
Brisk Walk/Jogging	1 minute	3.5 mph (5.6km/h)	2 minutes
Brisk Walk/Jogging	1 minute	3.5 mph (5.6km/h)	2 minutes
Brisk Walk/Jogging	1 minute	3.5 mph (5.6km/h)	2 minutes
Brisk Walk/Jogging	1 minute	4.0 mph (6.4km/h)	2 minutes
Brisk Walk/Jogging	1 minute	4.0 mph (6.4km/h)	2 minutes
Brisk Walk/Jogging	1 minute	4.0 mph (6.4km/h)	2 minutes
Brisk Walk/Jogging	1 minute	4.5 mph (7.2km/h)	2 minutes
Brisk Walk/Jogging	1 minute	4.5 mph (7.2km/h)	2 minutes

Instead of using the treadmill, patients can also exercise on the ground as highlighted in table 3.

Table 3: Aerobic Exercises based on a Badminton Training Session for Patients with Chronic Disease

Repetitions	Mode	Progression	Distance	Rest between Repetitions	Rest after set
6	Brisk Walking	Jogging	30 yards	30 sec	3 min
6	Brisk Walking	Jogging	15 yards	20 sec	3 min
10	Brisk Walking	Jogging	5 yards	10 sec	3 min

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Strength

Badminton is a sport that requires strength, along with speed and agility, to develop explosive movement and hit with power and control. Gains in strength may be made through using heavy weights and low repetitions and slow movements.



Players may train using weights with exercises such as the overhead press, squats and knee press ups. These movements may cause injury, so lower intensities are necessary to develop strength. As such, the strength exercises that should be utilised should include the exercises highlighted in table 4 with the use of machines – instead of free weights – in order to prevent injury.

The following examples of strength training exercises can be utilised for patients:

Table 4: Strength Exercises based on a Tennis Training Session for Patients with Chronic Diseases

Exercise	Time/Reps	Progression	Frequency	Break
Squats	8-10	15-20	2-3 times	30 sec
Squats with Medicine Ball	8-10	15-20	2-3 times	30 sec
Slight knee bend (minimal squat) and Jump	8-10	15-20	3 times	1 min
Lunges	8-10	15-20	3 times	30 sec
Pull-ups with rope assistance	10	20	3 times	1 min
Light Weight Bench Press or Knee Push-ups	8-10	15-20	3 times	1 min
Brisk Walking with Weight	10 meters	20 meters	5 times	30 sec

Comments

Squats

In patients with lower functional disabilities do not bend much and focus on technique*

Squats with Medicine Ball

In patients with lower functional disabilities do not bend much and focus on technique*

Slight knee bend (minimal squat) and Jump

*In patients with lower or upper functional disabilities** do not bend or raise arms much and focus on technique*

Lunges

In patients with lower functional disabilities do not bend much and focus on technique*

Pull-ups with rope assistance

*In patients with lower and or upper functional disabilities** do not bend much or extend arms much and focus on technique*

Light Weight Bench Press or Knee Push-ups

*Medicine ball or dumbbells can be used. In patients with upper functional disabilities** do not bend arms much and focus on technique*

Brisk Walking with Weight

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* lower functional disabilities: inflammation/osteoarthritis of the knee, hip, recent lower body surgery that causes pain and prevents appropriate range of motion

** upper functional disabilities: inflammation/osteoarthritis of the shoulders, elbow, trunk, recent upper body surgery that causes pain and prevents appropriate range of motion

Jumping is an extremely important power movement in badminton, so this can also be adopted for patients. Instead of plyometric training that is used in badminton training, jumping on the spot may be beneficial for patients, provided that functional ability permits such an action. For this type of exercise, the knees should be flexed to cushion and control the movement. Knees and hips should be well aligned to reduce the possibility of injury. All or combination of the following exercises may be used to help condition the body:

Two-footed jumps forward – 3 sets of repetitions

Side to side jumps (progression over a low height hurdle) – 3 sets of repetitions

Long strides whilst walking – 3 sets of repetitions

Use of bench to step up and down – 3 sets of repetitions

Use of bench to step right and left – 3 sets of repetitions

From a bench, jump off backwards, and immediately jump back on with feet at shoulder width apart – 3 sets of repetitions

Work: rest ratio should be a minimum of 1:6. Players should not attempt to do these exercises with weights until they are physically mature.

Cool Down (10 minutes)

Slow walking around the court. Rotate arms and wrists while walking and focus on controlled breathing.

General Comments

It is unheard that badminton has been used for rehabilitation of patients with chronic diseases. So it is important to note that when the coach/volunteer introduces the game and the training to the patient, he/she should explain to the patient that the training will be progressive. Matches and games should be avoided at the start of a training programme until the patient is more fit and has better functional ability. After the 3rd month, the patients can start getting involved with more badminton specific training such as games with pairs, but this should only be done if the patient does not have any difficulties with any movements, which is possible. Due to the high intensity of this the game, it is important for the coach/volunteer to explain to the patient that a training period of 2-3 month exercising at least 2 times per week aerobically and 1 times per week using strength training, is necessary to build up the physical components that are needed to avoid injury and get involved with this sport.

Badminton Walking Concept

An alternative variation of badminton is walking badminton, an easier way of enjoying this game which is similar to walking football. The rules can be tailored by coaches/volunteers, but in general, patients should always walk (no running/jumping is allowed), whereas the shots should always be hit from underneath (no smashes or above the head shots allowed to avoid overextension/injury). The games could also be played to 11 rather than 21, to reduce the intensity of the overall game.

