

Exercising before surgery

Information for patients



We have given you this booklet because you may be having a surgical procedure in the future with University Hospital Southampton NHS Foundation Trust (UHS). It explains the importance of exercising before your surgery and how to increase your exercise levels safely and effectively. We hope it helps to answer some of your questions. If you have any further questions or concerns, please contact us using the details at the end of this booklet.

Why do I need to exercise before my surgery?

Exercising before having surgery has been shown to improve fitness, allowing the body to cope better with the stress of surgery.

Exercise is also beneficial for your long-term health and can help reduce the risk of many chronic diseases like diabetes, heart disease, stroke, and cancer.

Being more active may also lead to:

- improved energy levels
- reduced stress
- improved sleep quality
- improved confidence
- increased sense of wellbeing
- weight loss

By following the information in this booklet, you can feel confident that you are doing everything you can to stay healthy and prepare for your surgery.

What is physical activity?

Physical activity is any body movement that uses energy. It is important to remember that this can include sport and exercise but also activities in your everyday life, such as walking, gardening and housework.

What is exercise?

Exercise refers to planned and structured physical activity that aims to improve physical fitness. This may include going to the gym, running, or attending an exercise class.

Exercising safely

It is important to take care of yourself when exercising. Here are a few rules you should follow:

Don't exercise if you:

- have been unwell
- have an infection or the flu
- have recently developed new symptoms of dizziness, chest pain or chest tightness

Stop exercising if you start to experience:

- dizziness or nausea (feeling sick)
- chest pain or chest tightness
- breathing problems or you become very short of breath
- unusual joint or muscle pain

Contact your general practitioner (GP) or NHS **111** for advice if you have any concerns or develop any of the symptoms listed above.

If you have any pre-existing health problems, you should consult your GP before starting any physical activity or exercise programme.

What type of exercise should I do before my surgery?

Aerobic exercise

Aerobic exercise should be prioritised before having surgery. Aerobic exercise refers to activities that increase your heart rate and breathing rate and cause your muscles to work harder.

Examples of aerobic exercise include:

- brisk walking
- jogging
- running
- cycling
- swimming

Aerobic exercise can be performed at different intensities and can be continuous (without breaks) or interval-based (with short recovery periods).

We recommend interval training as the most effective way to improve your fitness before your surgery. For more information about this, please see the 'high-intensity interval training (HIIT)' section on page 8.

You can improve your cardiovascular fitness (how well your heart and lungs supply the oxygen you need while you exercise at medium to high intensity) by doing aerobic exercise three times a week for four to six weeks. Some people may start to notice an improvement after just two weeks, especially those who are less active.

What if I am currently not very active?

If you are not currently able to perform moderate-intensity exercises, light-intensity activities have also been shown to have some health benefits and are worth doing.

We recommend increasing the time and frequency of light-intensity activities you do throughout the day and reducing the amount of time you sit down for (this is known as sedentary time). This will help you to remain active throughout the day.

You should aim to do a mixture of light-intensity activities every day. For example:

- the sit-to-stand exercise (for more information about this exercise, visit: www.nhs.uk/live-well/exercise/strength-exercises)
- short walks (even around the house)
- stair climbing
- strength and balance exercises (for example, tai chi, yoga or lifting cans of beans or weights)
- walking
- housework
- gentle gardening
- standing for short periods of time

When you first start to do these activities, it is better to focus on increasing how long you do them for, rather than how hard you push yourself. We recommend starting with 5 minutes, then slowly building up to 10 minutes, eventually working up to 30 minutes in total.

How is the intensity of exercise measured?

The Borg Rating of Perceived Exertion (RPE) scale

The Borg RPE scale is a way of measuring the intensity of exercise. When using the Borg RPE scale, think about how out of breath you feel when exercising, as well as how tired your muscles are. This will help you to understand what exercise intensity level you are performing at.

It's important to exercise at a moderate to high-intensity level to get the most health benefits. The higher the intensity of your exercise, the more your heart rate and breathing rate will increase (this is a normal response during exercise).

- For **moderate-intensity exercise**, you should aim for an exertion rating in the range of 5 to 7.
- For **high-intensity exercise**, you should aim for an exertion rating in the range of 8 to 10.



The Borg Rating of Perceived Exertion (RPE) scale

Exercise intensity level	Exertion rating		Description
Low	0	Nothing at all	You will not be out of breath.
	1	Just noticeable	You could continue the exercise or activity all day.
	2	Very slight	You could continue the exercise or activity for hours.
	3	Slight	You will be able to hold a conversation without getting out of breath.
	4	Slight to moderate	You will be able to speak a few sentences while carrying out the exercise or activity.
Moderate	5	Moderate	You will still be able to hold a conversation, but you will need to make an effort to keep going with the exercise or activity.
	6	Some difficulty	You will find it slightly harder to breathe and you will find it takes more effort to keep going with the exercise or activity.
	7	Moderately severe	You will be able to speak in short sentences, but you will need to make a constant effort to keep going with the exercise or activity.
High	8	Severe	You will struggle to say more than two to three words at a time, and you will need to concentrate fully to keep going with the exercise or activity.
	9	Very severe	You will be almost completely out of breath and find it difficult to speak at all.
	10	Maximal shortness of breath	Maximal effort. You will be completely out of breath and unable to talk.

Maximum heart rate (HRmax)

If you want to make sure you are exercising at the right intensity, you can use your maximum heart rate (HRmax) as a guide. To calculate your predicted HRmax, you need to subtract your age from 220 ($220 - \text{your age} = \text{HRmax}$).

- For **moderate-intensity exercise**, your heart rate should be between 55% and 75% of your predicted HRmax.
- For **high-intensity exercise**, your heart rate should be more than 75% of your predicted HRmax.

Please note that if you take medications that slow your heart rate down, such as beta blockers, it is best to avoid using your heart rate to guide your exercise intensity level. We recommend that you use the Borg RPE scale as a guide instead, as it will be more accurate for you.

What are the different intensity levels of exercise?

Intensity level	Physical activity examples
Sedentary	Sitting and watching television
Light	Cleaning and yoga
Moderate	Walking and cycling
High	Swimming and running
Very high	Sprinting and weights

High-intensity interval training (HIIT)

High-intensity interval training (HIIT) is a type of exercise that involves brief periods of high-intensity exercise followed by recovery periods. HIIT provides similar health benefits as longer workouts but in a shorter period. You can do HIIT while walking, running, cycling or swimming.

- During **high-intensity periods**, you should exercise at more than 75% of your HRmax or at a Borg RPE scale exertion rating of 7 to 9.
- During **recovery periods**, you should exercise at a moderate-intensity level of around 45 to 55% of your HRmax or at a Borg RPE scale exertion rating of 3 to 4.

If you haven't had a cardiopulmonary exercise test, also known as a CPET (a non-invasive exercise test performed to assess the function of the heart and lungs during strenuous exercise), or are worried about starting HIIT, talk to a healthcare professional first. If you've had a CPET, the physiologists will let you know if it's safe for you to exercise at a high intensity.

How should I increase my exercise levels before surgery?

Over a period of one week, adults should aim for:

- **150 minutes (20 minutes a day)** of moderate-intensity aerobic exercise (for example, fast walking) **or**
- **75 minutes** of vigorous-intensity aerobic exercise (for example, running, swimming, or climbing the stairs) **or**
- a combination of moderate and vigorous-intensity aerobic exercise

If you haven't exercised for a while, you should start with 10 minutes a day and gradually build up to achieving these goals.

Strength and resistance exercises should also be performed at least twice a week, exercising all the major muscle groups in the body:

- | | |
|---------|----------------------|
| • chest | • abdominals (tummy) |
| • back | • legs |
| • arms | • shoulders |

Examples of strength and resistance exercises:

- Upper body exercises - bicep curls, triceps extension and shoulder press
- Abdominal exercises - abdominal curls and plank
- Leg exercises - squats, lunges and heel raises

Balance and flexibility exercises should also be performed at least twice a week.

Examples of balance and flexibility exercises:

- Stretching
- Yoga
- Tai chi
- Pilates

It is also important that you minimise how much time you sit down for (sedentary time). You can reduce sedentary time by doing light activities such as walking or standing at regular intervals throughout the day.

Where can I get additional support with exercising?

Maggie's (Southampton)

Maggie's is a charity that provides free cancer support and information in centres across the UK and online. If you have been affected by cancer, you may be interested in receiving extra support from the Maggie's centre at Southampton General Hospital. There's no need to book an appointment, simply just turn up.

Telephone: **023 8212 4549** (Monday to Friday, 9am to 5pm)

Email: southampton@maggies.org

Website: www.maggies.org/our-centres/maggies-southampton

Gyms

- Basingstoke Aquadrome (Basingstoke) - www.basingstokeleisure.com/basingstoke-aquadrome
- BH Live Active (Southampton, Bournemouth, Poole and Portsmouth) - www.bhliveactive.org.uk
- Cancer United (Littlehampton) - www.cancerunited.org.uk
- Everyone Active (various locations) - www.everyoneactive.com
- Freedom Leisure (Southampton and the New Forest) - www.freedom-leisure.co.uk
- Gang Warily Recreation and Community Centre (Fawley Parish) - www.gang-warily.co.uk
- Horizon Leisure Centre (Havant, Waterloo and Guildford) - www.horizonlc.com
- Places Leisure (Andover, Southampton, Ferndown and Gosport) - www.placesleisure.org
- Wiltshire Council leisure centres - www.wiltshire.gov.uk/leisure-leisure-and-sport-centres
- Inclusive gyms (various locations) - www.activityalliance.org.uk/get-active/inclusive-gyms

Websites

- NHS - www.nhs.uk/live-well/exercise
- Couch to Fitness - www.couchtofitness.com
- WheelPower - www.wheelpower.org.uk/get-active/exercise-at-home

Apps (free)

- NHS Couch to 5K (a progressive nine-week, three-times a week running programme)
- NHS Active 10 (a walking app)
- EXI (a personalised workout plan app)
- Go Jauntly (a walking app)

Exercise programme: Warming up

Before starting any exercise, it's important to warm up properly. Warming up helps prepare your body for exercise by increasing blood flow to your muscles, reducing the risk of injury and muscle soreness.

A warm-up routine should:

- take roughly 5 to 15 minutes
- start at a low-intensity level
- include an activity that gradually increases your heart rate
- include some stretches

If you are warming up before using a stationary exercise bike, you should cycle for five minutes at a low-intensity level.

If warming up for a brisk walk, you can either do an indoor warm-up routine or start with five minutes of slow walking.

Warm-up routine example

You can do this warm-up routine while sitting or standing. When doing chair-based exercises, you should sit upright, don't lean against the back of the chair, and keep your feet flat on the floor. If standing, you should stand upright with your feet shoulder-width apart. If balance is an issue, stand in front of a chair for support.

1. **Marching:** March on the spot for one minute, lifting your knees and swinging your arms.
2. **Side toe taps:** Stand with your feet shoulder-width apart and your hands on your hips. Step to the side with your left leg and then bring it back to the middle. Repeat this with your right leg. Do this for one minute.
3. **Calf raises:** With your hands resting on the front of your thighs, lift both of your heels up and then lower them back down. Repeat this 10 times.

4. **Trunk twists:** Cross your arms, touching the opposite shoulders or elbows. Rotate your body to the left as far as feels comfortable and back to middle and then to the right. Do this for one minute.
5. **Shoulder shrugs:** Raise both shoulders up to your ears and then back down. Do this 10 times.

Exercise programme: Walking

Walking is a good way to exercise, and you can do it in different ways. You can either walk outside or use a treadmill inside. We recommend walking three to five times a week.

Moderate intensity (Borg RPE scale exertion rating of 5 to 7)

Walk for at least 30 minutes a day at a speed of more than two miles per hour. If you are using a treadmill, adjust the incline to increase intensity.

High intensity (Borg RPE scale exertion rating of 8 to 10)

To increase the intensity, you can increase the speed, distance or duration of your walk. You could also try walking up hills for a more intense workout. For example, walk up a hill for two to three minutes at a brisk pace, walk down the hill to recover and repeat five to 10 times.

HIIT for beginners

If you want to try HIIT when walking, start by walking at a moderate-intensity for four minutes, followed by one minute of fast walking at a vigorous-intensity. You should aim to repeat this three to five times to achieve 15 to 25 minutes of walking in total.

Lamp post interval training

Week one	Walk from one lamp post to the next at a moderate pace. After reaching the next lamp post, walk as fast as you can to the next one. Repeat this for 10 to 15 minutes, two to three times a day.
Week two	Walk at a moderate pace from one lamp post to the next. Then walk as fast as you can to the next two lamp posts. Repeat this for 10 to 15 minutes, two to three times a day.
Advanced	Walk for three minutes at a moderate pace, then walk at a fast pace for two minutes. Repeat this pattern until you have walked for 30 minutes. To track your progress, time yourself once a week while walking a one-mile route. Try to beat your previous weeks.

Exercise programme: Cycling

Cycling can be done outdoors on a push bike or indoors using a stationary bicycle.

Moderate intensity (Borg RPE scale exertion rating of 5 to 7)

- Outdoor cycling: Cycle continuously for 30 to 60 minutes at a speed that feels like 5 to 7 on the Borg RPE scale. The speed at which you cycle will depend on the type of surface you are riding on.
- Indoor cycling: Maintain a steady speed or resistance at a moderate level for 30 to 40 minutes.

High intensity (Borg RPE scale exertion rating of 7 to 9)

- Outdoor cycling: Cycle continuously for 20 to 30 minutes at a speed that feels like 7 to 9 on the Borg RPE scale. Going uphill will make your workout harder. The speed at which you cycle will depend on the type of surface you are riding on.

- Indoor cycling: Maintain a steady speed or resistance at a high-intensity level for 15 to 20 minutes.

HIIT indoor cycling

A HIIT indoor cycling session involves changing the resistance on an exercise bike to make it harder for short periods while cycling at the same speed. If the bike doesn’t have adjustable resistance, you can cycle faster and use the Borg RPE scale to guide the intensity level.

Try to do a HIIT indoor cycling session three to five times a week.

Weeks one to two	Cycle at a moderate resistance (Borg RPE scale exertion rating of 3 to 4) for three minutes, then increase to a high resistance (Borg RPE scale exertion rating of 7 to 9) for two minutes. Repeat the above until you have cycled for 20 to 30 minutes in total.
Weeks three to four	Increase the total time cycling to 30 or 40 minutes by adding in another interval. If the high interval is becoming easier, increase the resistance or speed at which you are cycling.

Breathing exercises

After your surgery, you may find that it is difficult to take deep breaths and cough. This is normal, but it can affect your lung function and lead to complications, such as pneumonia (inflammation of the lungs). To help prevent this, it is important that you do a breathing exercise called the ‘active cycle of breathing technique (ACBT)’ every hour that you are awake while you are in hospital.

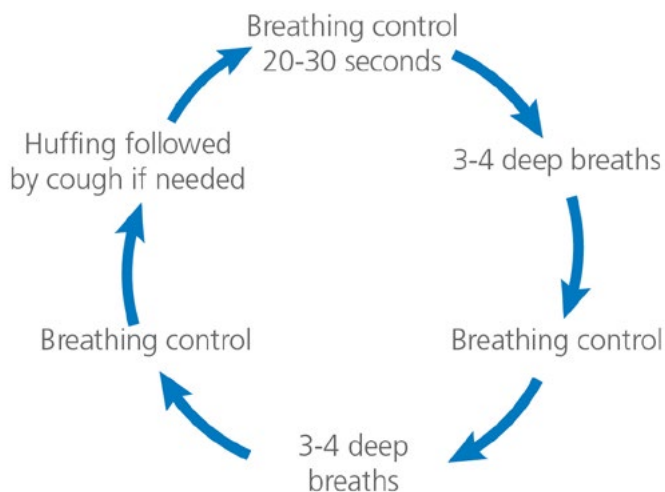
The ACBT is made up of three parts that form a cycle (as shown below):

- breathing control
- deep breaths
- huff or cough

For more information about the ACBT, please visit: www.uhs.nhs.uk/Media/UHS-website-2019/Patientinformation/Respiratory/The-active-cycle-of-breathing-technique-ACBT-747-PIL.pdf

We recommend that you start doing this breathing exercise before your surgery to help build up your muscle strength.

After your surgery, the physiotherapists or nurses on the ward will remind you how to do the exercise and check your technique to make sure you are doing it correctly.



Setting exercise goals (week one)

Setting exercise goals before your surgery can help you to stay motivated and focused. To make sure your goals are effective, they must be SMART:

Initial goal

Specific

When setting a goal, it's important to have a clear and detailed plan. What exactly will you be doing?

Measurable

You can keep track of your progress in a diary, a smartphone app, or a fitness tracker. Choose the one that works best for you.

Achievable

Can you achieve the goal within the given timeframe? How will you make sure that you meet the deadline?

Relevant

When thinking about your goal, how does it relate to what you want to achieve?

Timely

Set a realistic start and finish date for your goal.

Exercise diary

Keep track of your activities and exercises using the exercise diary in this booklet. The exercise diary can help you monitor your activity levels better, and you can share the diary with your healthcare professional.

Remember to:

- aim to exercise three to five days a week
- exercise at a moderate to high intensity
- aim for at least 150 minutes (20 minutes a day) of moderate-intensity exercise a week
- focus on aerobic exercises to increase your cardiovascular fitness

Week one

Day	Type of activity or exercise	Using the RPE scale (0 to 10), how hard was the activity or exercise?	Time spent exercising (minutes)	Comments
Monday				
Tuesday				
Wednesday				
Thursday				
Friday				
Saturday				
Sunday				

Week two

Day	Type of activity or exercise	Using the RPE scale (0 to 10), how hard was the activity or exercise?	Time spent exercising (minutes)	Comments
Monday				
Tuesday				
Wednesday				
Thursday				
Friday				
Saturday				
Sunday				

Week three

Day	Type of activity or exercise	Using the RPE scale (0 to 10), how hard was the activity or exercise?	Time spent exercising (minutes)	Comments
Monday				
Tuesday				
Wednesday				
Thursday				
Friday				
Saturday				
Sunday				

How to stay motivated to reach your exercise goals (week three)

To help you stay motivated to reach your exercise goals, it's important to reflect on your progress so far. Looking back over the last three weeks will also allow you to make any necessary adjustments to be able to meet your goals by the end of week six.

Initial goal

SMART goal

Evaluate

How are things going for you so far? What has been working well and what has been difficult?

Re-adjust

If you're struggling to achieve your goal, take a moment to pause and reconsider. What can you change to make progress towards your goal easier?

Week four

Day	Type of activity or exercise	Using the RPE scale (0 to 10), how hard was the activity or exercise?	Time spent exercising (minutes)	Comments
Monday				
Tuesday				
Wednesday				
Thursday				
Friday				
Saturday				
Sunday				

Week five

Day	Type of activity or exercise	Using the RPE scale (0 to 10), how hard was the activity or exercise?	Time spent exercising (minutes)	Comments
Monday				
Tuesday				
Wednesday				
Thursday				
Friday				
Saturday				
Sunday				

Week six

Day	Type of activity or exercise	Using the RPE scale (0 to 10), how hard was the activity or exercise?	Time spent exercising (minutes)	Comments
Monday				
Tuesday				
Wednesday				
Thursday				
Friday				
Saturday				
Sunday				

Contact us

If you have any questions or concerns about exercising before your surgery, please contact us.

Perioperative medicine team

Telephone: **07464 516933** (Monday to Friday, 8am to 5pm)

Email: [**PREHAB@uhs.nhs.uk**](mailto:PREHAB@uhs.nhs.uk)

Notes

If you are a patient at one of our hospitals and need this document translated, or in another format such as easy read, large print, Braille or audio, please telephone **0800 484 0135** or email **PFSH@uhs.nhs.uk**

For help preparing for your visit, arranging an interpreter or accessing the hospital, please visit **www.uhs.nhs.uk/additionalsupport**

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