The ROYAL MARSDEN
NHS Foundation Trust

Resistance training and protein intake after a cancer diagnosis

Therapies department

Patient Information

NHS

Introduction

This guide is for people who have been seen by a Physiotherapist, Exercise Instructor, or Dietitian at The Royal Marsden.

It provides guidance about efficient exercise training and rest. It offers advice and ideas about how to add protein to your diet to help you build muscle efficiently when doing your resistance exercises. This includes guidance on the type, timing, and amount of protein you should be eating. It also advises how to contact a healthcare professional with a qualification in cancer nutrition when you need further support.

What is resistance exercise?

Resistance exercise involves using some form of resistance (such as weights, resistance bands, or your body weight) to put physical stress through a group of muscles in your body. This attempts to work and tire (fatigue) the muscles to a point where they will adapt to become stronger and more efficient.

There are many types of resistance exercises, some of which are proven to be more effective for muscle strengthening than others. Resistance training creates small microfibre tears in the muscle you train, which can sometimes feel like muscle soreness. The body then repairs these micro-tears in the muscle causing it to adapt and become stronger. Having adequate protein and nutritional intake, along with sufficient rest, speeds up this recovery and adaptation.

You are unlikely to see any differences in your muscles within the first 6–8 weeks of resistance exercises, however you will likely start to feel stronger after 2 weeks of exercise.

How much should I be doing?

People often count the number of repeated movements of a given exercise (reps or repetitions), take a short rest (between 30–90 seconds) and then repeat this process / these repetitions a few times (sets).

To improve muscle strength, we recommend:

- completing between 8–12 repetitions
- resting for 30–60 seconds
- repeating for 2–3 sets for each resistance exercise.

You should be aiming to slightly fatigue your muscles within these 8–12 reps or feel able to squeeze out 2–3 more repetitions if you needed to, rather than comfortably finish each set. You will need to adjust the amount of resistance depending on how many repetitions you can do in each set.

If you are new to resistance exercise, we suggest not to focus too much on how many repetitions you do. Practice your exercise technique with resistance in a good and relaxed posture and focus on the muscles you are trying to build. This will help you use just the correct muscles for that exercise and build muscle memory.

How often do I need to do this?

People can see benefits from resistance training by doing exercises at least 2 days per week although we recommend doing resistance training 3 days per week, for best results. Ideally, space these days out so that you have rest days in between.

Some people prefer to exercise more often than this and have a daily routine. There are benefits to this, however it is important not to do resistance training if you have muscle aches or soreness from the previous day. This is a sign that your muscles are still recovering and adapting. Some people exercise specific muscle groups on different days (such as upper body muscles one day, lower body the next day) which can work well to avoid over-training.

This QR code will direct you to our sessions for strength training as examples:

www.royalmarsden.nhs.uk/your-care/living-and-beyond-cancer/strength-training

Sleep and rest for regeneration

Good sleep allows the body to repair and restore cells (including muscle) that become depleted throughout the day. It has been shown that many functions in the body such as muscle repair and protein synthesis occur during sleep. If your sleep is disrupted, consider what is interrupting it and how it can be improved. Good sleep is important for more reasons than just muscle repair, so if you need support with this, talk to your GP, your clinical team, or your rehabilitation therapist at The Royal Marsden.

What is protein and why is it important?

Protein is a macronutrient that plays a vital role in the growth and repair of tissues and cells. It is essential for building and maintaining muscle, healing tissues, and for a healthy immune system. During digestion, protein is broken down into amino acids, which are the building blocks used for muscle growth. Protein also plays a role in maintaining immune function.

What foods contain protein?

There are a range of protein sources in our diet which can be broadly categorised as animal-based (meat, fish, eggs, and dairy) and plant-based (beans, lentils, soya, and nuts). You will also find small amounts in other foods such as bread, pasta, cereal and so on. Animal-based sources tend to contain all the

essential amino acids, however, plant-based sources may only contain a handful. This is why it is important to have a range of plant-based protein sources in your diet.

When should I eat it?

Protein should be eaten throughout the day rather than in one big meal. At high doses, not all the protein can be used by the muscles. Therefore, it is better to eat protein multiple times a day.

There is also ongoing research that suggests having some protein before sleep can prevent muscle breakdown overnight and therefore support muscle maintenance. The most beneficial form of protein for this is casein; this is a slow-release protein that can be bought in powder form or found in dairy foods such as milk and yogurt.

How much protein do I need to eat?

In the UK, the Reference Nutrient Intake (RNI) is 0.75g per kg body weight per day for adults. However, for individuals with cancer and individuals participating in resistance exercise, protein needs are increased to 1.2–2g per kg body weight per day.

Below shows an example of someone weighing 60kg and the calculations for their protein needs:

Weight 60kg

60 x 1.2 = 72g

60 x 2 = 120g

This demonstrates the protein requirements for someone weighing 60kg are between 72g and 120g per day.

Portion sizes of 15–25g at a time should be ideal for muscle growth and repair, with larger individuals tending to aim toward the larger portion size. If you are unable to eat a portion of the protein that provides 15–25g you should aim to eat your protein with a carbohydrate source such as bread, pasta or rice.

The table below shows examples of food portions that contain 20g of protein.

Food	Portion
Beef, lamb, pork	2 medium slices (75g)
Chicken (cooked weight)	1 small breast (75g)
Fish (grilled)	1 medium fillet (100g)
Tuna/salmon (tinned)	1 small can (100g)
Semi-skimmed milk	1 pint (600ml)
Low-fat yogurts	200g pots
Eggs	3 medium eggs
Baked beans	1 large can (400g)
Unsalted nuts/seeds	2 handfuls (100g)
Quorn mince	6½ tablespoons (165g)
Lentils	1¼ cup (225g)

Alternatively, you can use your hands as a guide to portion size – a portion of protein should equal the size of your palm.

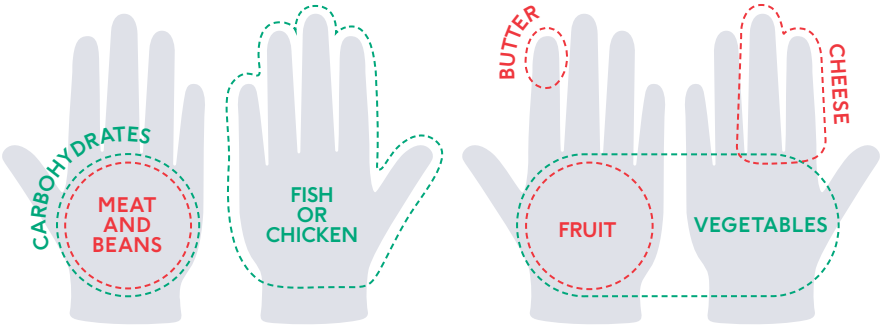

Image used courtesy of the British Heart Foundation
www.bhf.org.uk

Frequently Asked Questions (FAQs)

Do I need protein supplements?

If you have a good appetite and oral intake you should be able to meet all your protein needs through food and drink without protein supplements. However, those who have a poor appetite or oral intake may require nutritional shakes or supplements. If you are concerned you have a poor oral intake and are not eating sufficient protein, please request a discussion with a registered dietitian.

How do I increase my protein intake?

These small changes may boost your intake:

- Have Greek yogurt with your breakfast cereal
- Have high protein yogurts for dessert
- Add nut butter to your toast
- Ensure a good protein source at each meal
- Melt cheese into soups, sauces, scrambled eggs, and mashed potatoes
- Purée lentils and add to soups, stews, and sauces
- Drink high protein drinks such as milk and milkshakes
- Fortify milk with skimmed milk powder and use with tea/coffee/cereal
- Add protein powder to cereal, porridge, yogurts
- Add seeds and nuts to salads, soups, porridge.

Is too much protein bad for me?

For healthy individuals and those with cancer, research shows high protein intake will not cause any kidney damage. However, if you already have kidney disease or kidney damage due to treatment side effects it is recommended to not have excessive protein intake. It is also recommended to opt for plant-based sources of protein for those with kidney damage.

If you are concerned you are eating too much protein, please speak with your registered dietitian.

Should I take any supplements?

It is not recommended to take supplements during chemotherapy or radiotherapy treatment for cancer unless otherwise advised by a dietitian or doctor. If you feel you are not able to eat enough nutrients through your diet, please discuss appropriate multivitamins with your dietitian. Please use this QR code to find out more information on diet and supplements during cancer treatment:

https://patientinfolibrary.royalmarsden.nhs.uk/cancer-and-dietary-supplements

Further information and support

The Royal Marsden, Eating well

www.royalmarsden.nhs.uk/your-care/living-and-beyond-cancer/eating-well

Cancer Research UK, What is a healthy diet?

www.cancerresearchuk.org/about-cancer/causes-of-cancer/diet-and-cancer/what-is-a-healthy-diet

Contact details

If you have any questions, please contact the following teams at The Royal Marsden.

Dietitians

Tel 020 7808 2814

Email rmh-tr.rmdietetics.chelsea@nhs.net

Physiotherapists

Tel 020 7808 2821 (answerphone)

Email physiotherapy.referrals@rmh.nhs.uk

The Royal Marsden Macmillan Hotline: 020 8915 6899

You can ring the hotline 24 hours a day, 7 days a week.

Call us straight away if you are feeling unwell or are worried about the side effects of cancer treatments.

This service provides specialist advice and support to all Royal Marsden patients, as well as to their carers, and both hospital and community-based doctors and nurses caring for Royal Marsden patients.

References

This booklet is evidence based wherever the appropriate evidence is available, and represents an accumulation of expert opinion and professional interpretation.

Details of the references used in writing this booklet are available on request from:

The Royal Marsden Help Centre
Telephone: Chelsea 020 7811 8438 / 020 7808 2083
Sutton 020 8661 3759 / 3951
Email: patientcentre@rmh.nhs.uk

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Should you require information in an alternative format, please contact The Royal Marsden Help Centre.

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