Local Metro Adelaide Palliative Care Services

Managing fatigue associated with chronic illness

A resource for clients

Government of South Australia

SA Health

Part A: An intervention using fish oil, protein and resistance exercise

What is fatigue?

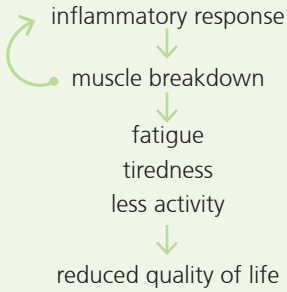
Often people dealing with a chronic illness lose weight unintentionally. When muscle is lost along with fat, fatigue, weakness and loss of appetite can occur. This can make it difficult to carry out everyday tasks, which can affect quality of life.

The program outlined in this booklet is a multi-modal approach that combines fish oil supplements, protein supplements and resistance exercise. It has been shown to have a positive response from clients and has been adopted widely for a range of health conditions. The purpose of this booklet is to provide information about how you can incorporate this approach into the management of your condition, and what the potential benefits may be. While we believe this is a low risk therapy, each case needs to be considered individually and we recommend talking to your doctor before proceeding.

Muscle wasting

The body's first line of defence against disease is to induce what is called an inflammatory response. However, if this goes on for too long the body starts to break down muscle. Muscle is made up of protein. When muscle is broken down, the protein released into the bloodstream 'feeds' this inflammatory response. Less muscle also means you can't fight any infections as well as you normally would.

If the inflammatory response can be slowed down, then the protein that you eat has more potential to be used to re-build muscle, when combined with resistance exercise.



Three steps to improve your quality of life

> Slowing down the inflammatory response
> Giving your body what it needs to rebuild muscle
> Building muscle

Step 1: Slowing down the inflammatory response

Fish oil

Fish oil contains eicosapentanoic acid (EPA), a substance known to reduce inflammation. By making sure we have enough EPA from fish in our diet the inflammatory response may be slowed down. The recommended intake of EPA to reduce inflammation is 1.4-2.0 grams per day. Use the guide in the table on page 7 to see how easy it is to get enough EPA in your diet. You may do this using supplements or everyday foods, the choice is yours.

Step 2: Giving the body what it needs to rebuild muscle

Protein

Proteins are made up of 20 amino acids. When we eat protein it is broken down in the body into these amino acids and reassembled into proteins our body requires. There are many supplements on the market that contain varying amounts of protein. However, protein requirements can easily be met by eating everyday foods. Protein can be found in a variety of animal and plant foods (see table on page 8).

Supplements

If you choose to use supplements in your diet, whey protein may be of benefit because:

> it is easily absorbed by the body
> it is high in special types of amino acids called branched chain amino acids. These are essential for the body to make proteins, such as muscle
> whey protein is also high in an amino acid called cysteine. This particular amino acid goes on to make a substance called glutathione, which may play a vital role in improving immunity and slowing down the inflammatory response.

Whey protein supplements vary widely in cost and are available from health food stores and most supermarkets. The whey protein content doesn't vary much between brands, but the more expensive products have other types of protein added as well as extra amino acids, vitamins and minerals.

Protein requirements

The National Health and Medical Research Council (2006) recommends that adults have between 0.75 and 1.07 grams of protein per kilogram of body weight every day.

We recommend an intake of 1.2–2.0 grams of protein per kilogram of body weight every day to help regain lost muscle where muscle wasting has been experienced. This is in accordance with the ESPEN Guidelines on Enteral Nutrition (2006).

For example, for a 60 kilogram person to rebuild muscle we recommend the following:

60 x (1.2–2.0 grams) = 72–120 grams protein per day

Example of what 72 grams of protein looks like over one day (incorporated into your normal varied diet)

> 3/4 cup milk (on cereal).
> + 1 tin of salmon (95g).
> + 2 slices of bread.
> + 60g whey powder added to 1 cup of milk.
> + 50 gms meat/chicken.

Step 3: Building muscle

Resistance exercise

The role of physical activity in relation to health is well known. When done regularly, exercise has a positive effect on the body's immune system, as well decreasing inflammation.

Resistance training is exercise performed using weights. This type of exercise challenges the muscles and when adequate dietary protein is present, increases muscle mass, improving strength. This has the potential to decrease fatigue and tiredness, which in turn may lead to increased activity and therefore improve quality of life.

A set of six resistance exercises are performed that train the major muscle groups. Not everyone will be able to perform all six exercises. The physiotherapist will advise on which are suitable, how many sets to do and the number of repetitions required. There is also an option for bed bound clients. Further information about the exercise program can be found on page 9.

Are there any risks?

Potential risks of using fish oils:

Fish oil can increase the effect of some medications (eg blood thinning medications, such as warfarin). Please check with your doctor.

Large doses of fish oil may cause diarrhoea, reflux, bad aftertaste, and nausea in some people.

Cod liver and halibut liver oils are not suitable supplements for this program as they contain vitamin A, which is toxic in high doses.

Fish oil supplements are not a major source of mercury (refer to page 7 for more information on mercury in fresh fish).

Concerns about protein

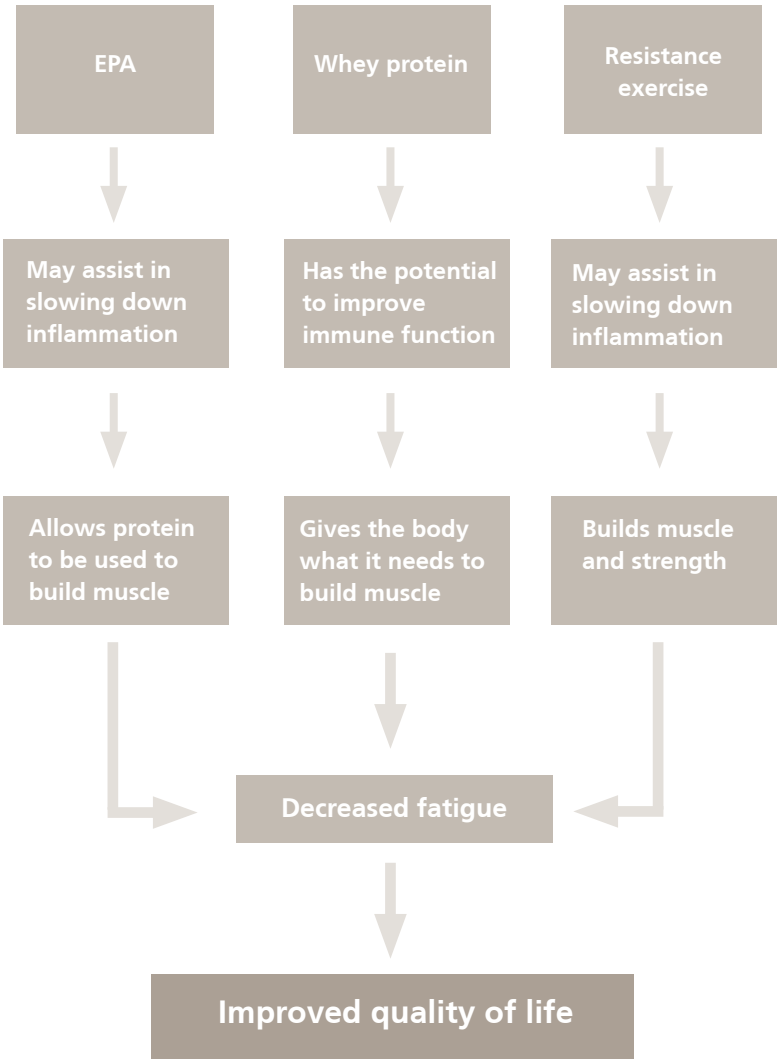
Some conditions (such as kidney disease) may require protein restrictions. Please check with your doctor.

Always make sure your diet has lots of variety

Include foods from the following food groups everyday as they contain a wide variety of vitamins, minerals, fibre and antioxidants known to benefit health.

> Meat, chicken, fish, nuts or legumes
> Breads, wholegrains, rice and pasta
> Dairy foods (cheese, milk, yoghurt or calcium fortified soy products)
> Plenty of fruit and vegetables

How it all fits together



Where to find EPA

Foods/supplements that contain EPA	Serve size	Grams of EPA
Fish oil capsules	8–11 capsules	1.4–2.0
Fish oil liquid	2–21/2 teaspoons	1.8–2.2
Oily fish (sardines, salmon, mackerel)	100g tin, 150g fillet	0.66 1.0
High energy supplements (Resource Support, Prosure)	1 carton (approx 240 mls)	1.0

Mercury in fresh fish

Mercury may accumulate in some large predatory fish. The following is a guideline to the different types and quantities of fresh fish that can safely be consumed.
www.foodstandards.gov.au

Recommendations for adults

One serve of fresh fish equals 150 grams. May consume two to three serves per week of any fish and seafood except shark (flake), billfish (swordfish/broadbill and marlin) – only one serve per week of these fish and no other fish for that week.

Fish oil capsules, liquid and supplements containing fish oil are not a source of mercury.

Where to find protein

Foods that contain protein	Serve size	Grams of protein
Red meat/chicken (cooked)	150g	40
Fish (fresh cooked or canned)	100g	18–26
Nuts	1/2 cup	14
Skim milk – fresh	250ml	10
Full cream milk – fresh	250ml	8
Lentils, beans (cooked)	1 cup	6–8
Bread	2 slices	6–8
Egg – whole	1 large	6
Cheese	1 slice – 20g	5
Rice, brown or white (cooked)	1 cup	5
Egg – white only	1 large	3
Supplements		
Sustagen (Hospital Formula) – added to skim milk*	60g 250ml	14 24
Novartis Resource Support Abbott Prosure	237ml 240ml	21 16
Skim milk powder – added to skim milk*	30g 250ml	11 21
Whey powder – added to skim milk*	60g 250ml	8 18
* Using full cream milk will provide extra kilojoules, but slightly less protein.		

Part B: Progressive resistance exercise and functional activities

What is progressive resistance exercise?

Progressive resistance exercises help build muscle strength using light weights, and repeated movements. You can do them while sitting, standing up, or even when you are out doing your normal activities.

Why should I do progressive resistance exercise?

Progressive resistance exercises have lots of benefits for your health generally, which include:

> feeling less tired
> better mobility
> fewer falls
> strengthens bones
> more independence with everyday activities
> improved quality of life.

Progressive resistance exercises may also slow down the weight loss experienced by many clients with chronic conditions or cancer (Al-Majid and Waters 2008).

How does resistance exercise work?

Experts tell us that using your muscles against resistance with light weights helps to stop muscle wasting and build muscle.

Current research also tell us that combining resistance exercise with protein supplements may help this process (Little and Phillips 2009).

Who can help me with resistance exercises?

The physiotherapist linked with your palliative care team can help you decide which exercises are best for you.

Are there alternatives to structured exercise?

It may be that you are unable to complete a structured resistance exercise program due to:

> difficulty fitting these in to your daily routine

or

> maybe this is something you are not motivated to do.

However it is worth knowing that there are benefits from the exercise you receive while doing your day to day activities. Modifying your daily, 'functional' activities may be a great way to maintain your independence and improve your muscle strength.

Examples may include:

> gardening – four toe raises whilst reaching up to hanging plants
> shopping – lift shopping bags from boot of car.

You will find more information about modifying 'functional' activities on pages 14 and 15.

General guidelines for resistance exercises

> Each exercise should not take more than two minutes – remember to rest between exercises.
> Three times a week is optimal – a rest day between exercises is important.
> None of the exercises should cause you pain.
> Slow, steady and smooth movements throughout the exercise – three seconds up and three seconds down.
> Try to avoid holding your breath during the exercises.
> Your exercise plan needs to be flexible: if you are feeling particularly unwell, be prepared to change and do your exercises another day.

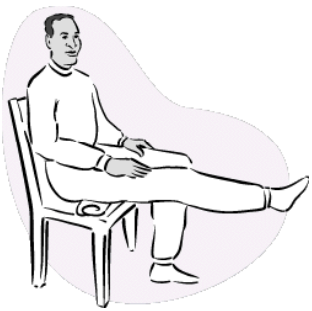
How should I progress my exercises?

> Start at four repetitions of each exercise and build up to a maximum of two lots of eight repetitions.
> Start the exercises with 0.5 kilogram weights. Doing the exercises with no weights is also helpful.
> When a movement is no longer challenging, and you are already completing two sets of eight repetitions in a controlled way, increase the weight by 0.5kg.
> Remember – slow, steady, smooth, three seconds up, three seconds down.

Try some of these exercises …

Knee strength

This exercise helps to strengthen the muscles around your knees, which can help with mobility.



> Sit in chair, with both feet on the floor.
> Take three seconds to lift one foot off floor, by straightening your knee as much as possible.
> Hold one – two seconds, then slowly bend your knee to lower your foot.
> Repeat with your other leg.

Side hip raise

This helps to strengthen the muscles at the side of your hips (important for walking and balance).

> Stand behind a tall chair and hold for balance.
> Take three seconds to slowly lift one leg out to the side, taking care not to tilt your body. Keep your foot pointing forward as it lifts to the side.
> Pause, then slowly lower the leg again, taking three seconds.
> Repeat with other leg.

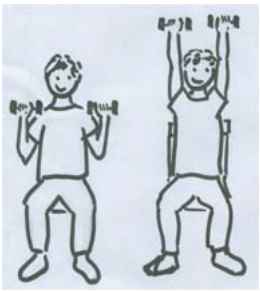
Toe raises

This exercise helps to strengthen your ankles and calf muscles. It can help you with walking.

- Stand behind a chair with your hands holding the back.
- Slowly lift both heels as high as possible, until standing on your tippy-toes.
- Hold position one – two seconds, then slowly lower onto your heels.

Overhead arm raise

This exercise helps to strengthen your shoulders and upper arms. It can help you with overhead activities.



- Sit or stand with arms bent at elbows, palms at shoulder height facing out and holding your starting weight.
- Slowly, taking three seconds, push your hands upwards towards the ceiling, straightening both elbows. Remember to keep the neck relaxed.
- Take three seconds to slowly bend the elbows and bring the hands back to shoulder height.

Biceps curl

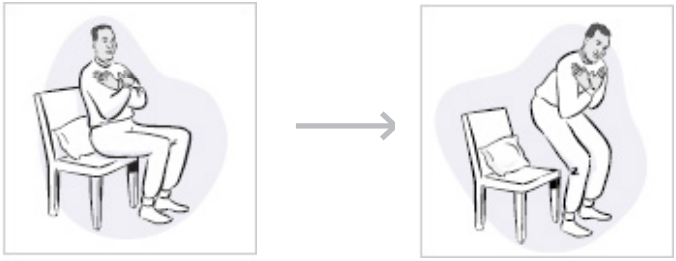
This simple exercise helps to strengthen your upper arm muscles.

- Sit in a chair, holding a weight in each hand and palm facing upwards.
- Slowly lift the weight by bending at the elbow.
- Hold one – two seconds, then slowly lower the weight.
- Repeat on the other side, or do both arms at the same time.

Chair stand

This exercise strengthens your legs to help you safely get into and **out of chairs.**

> Start in seated position with your knees bent and feet flat on the floor.
> Move your bottom forwards on the chair seat.
> Bring your feet back towards the chair legs.
> Move your shoulders forwards over your knees and push through your legs to stand up in slow motion (take three seconds). You may use your arms if you need to.
> Feel the chair on the back of your knees, and reach back for the armrest.
> Slowly lower back into the chair, taking three seconds to sit down.



Images courtesy of National Institute of Ageing 2006

Use of functional activities as exercise

Functional activities can be used to supplement the resistance based exercise program or as a substitute, where you may be wishing to maximise your ability to perform purposeful everyday activities and improve your quality of life. The type of everyday activities you choose to do should:

> be easily incorporated into your daily routine
> be meaningful
> be considered in conjunction with your carer and their roles
> apply the appropriate amount of resistance
> be able to be progressed over time
> encourage slow steady and smooth movement
> be safe for your physical abilities.

Who can help me with functional activities?

The occupational therapists linked with your palliative care team can help you decide which functional activities are the best form of exercise for you.

Graded activity tables

Grading allows a person to complete an activity or stages of an activity within their capacity. The activities tabled on the next page have been modified with each option increasing in the degree of difficulty.

The principle behind grading is to simplify an activity and set it at option1, then progress through option two and three by making the activity more fatiguing as you feel able. There is no set rule which explains how to grade, it is up to you to set stages that are progressive and achievable.

For an extra challenge, resistance exercises can be added to each activity. These too can be progressed in terms of level resistance and number of repetitions. The general guidelines for resistance exercise should be followed for these.

Gardening		
Option	**Activities**	**Resistance exercise (build up from 4x)**
1	Watering plants	Using watering can, lift up and down before each plant
2	Light pruning plus watering plants	Toe raises up to prune higher plants
3	Potting soil and planting plants	Leg raises if seated for activity

When to contact your physiotherapist or occupational therapist

If you are uncertain, or have any questions about the resistance exercises or functional activities, please feel free to contact us.

The physiotherapists and occupational therapists linked with your palliative care team can be contacted using the details on the back of this brochure.

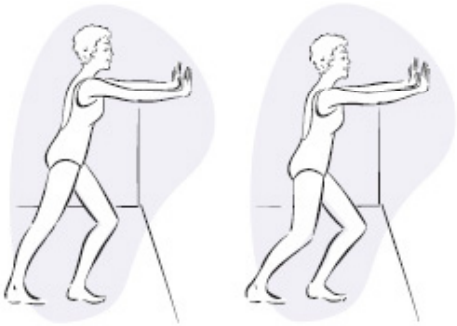
If you notice any of the following, we recommend that you seek further assistance from us or your qualified health practitioner:

> unusual or new pain
> swelling/redness
> problems with your breathing or your heart
> if you are uncertain about how to complete any of the exercises.

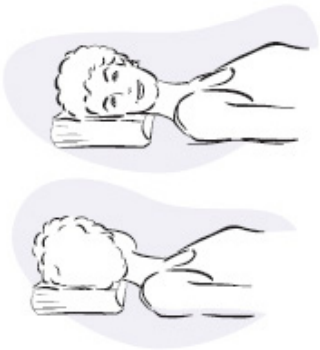
What other exercises can I do?

Some general stretching will help you to prevent muscle tightness.

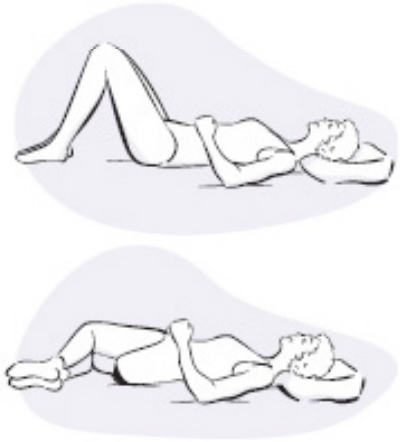
These are some suggestions of good stretches to do.



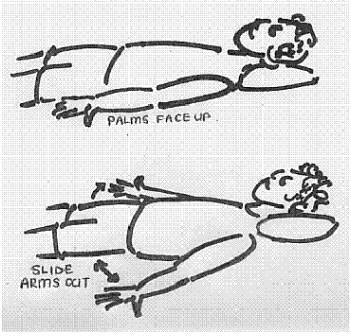
Calf stretch



Neck stretches



Back stretches



Chest stretches

Images courtesy of National Institute of Ageing 2006

Notes

References

Little, JP & Phillips, SM 2009, 'Resistance exercise and nutrition to counteract muscle wasting'. *Applied Physiology, Nutrition and Metabolism,* vol. 34, pp. 817-828.

Oldervoll, L, Loge, J, Paltiel, PT et al. 2006, 'The effect of a physical exercise program in palliative care: A phase II study.' *Journal of Pain and Symptom Management,* vol. 31, no. 5, pp. 421-430.

National Institute of Aging (2006), Chapter 4: Sample Exercises, Accessed 10/6/2011 at: www.nia.nih.gov/HealthInformation/Publications/ExerciseGuide/chapter04.htm

Acknowledgement

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For more information

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Tel: (08) 8275 1732

If you do not speak English, request an interpreter from SA Health and the Department will make every effort to provide you with an interpreter in your language.

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