

# Hues

Your guide to a  
functional body of Health

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Disclaimer:

This book is for informational purposes only and does not substitute a proper consultation with a certified healthcare professional. When in doubt, always consult your NKF physician or exercise specialist. Any application of the recommended material in this book is at the sole risk of the reader, and the reader's discretion.

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# Our Vision & Mission

## Giving **Life** & **Hope**

*through*

affordable, sustainable & quality renal care

*and*

education & prevention of kidney disease

*in*

partnership with the community

This book fills a very important part of the holistic care that we provide our patients. It is specially written for renal patients who are at risk of developing muscle atrophy. Read on and take charge! Discover the path towards a functional body. As you progress through the exercises, observe how your body is strengthened over time.

# Our Programmes

Our patients get to participate in a variety of programmes and activities specially designed for them. These include day exercise class, exercise video during dialysis, dialysis centres exercise corner, annual functional fitness assessment and an outdoor event, NKF Health for Life Day.



## On the Mark: Information to Get Started

Developing the right attitude is key.



### Decision

No one can persuade you to exercise. It must be a conscious decision on your part. If you aren't convinced, why not give exercise a try, say for 3 months? During this time, exercise regularly (One exercise session will not help.) As time goes by, you will start to feel the benefit. You will begin to appreciate exercise as a part of your treatment, together with diet and medication.



### Persistence

There will be times that you will miss your exercise sessions for a number of reasons, including the occasional hospitalisations.

Don't give up! Start again from a lower threshold and you will soon work your fitness up again. There will be good days and bad days. If some days you feel very tired, you can exercise for a shorter period of time. Even 5 minutes is better than not exercising at all!



### Time commitment

With a little planning, anyone can work some exercise into his daily schedule.

Remember – it will really help you, so it's worth making it a priority.

## Benefits of exercising

Many patients believe that they cannot exercise. Maybe there are certain exercises that are not suitable for them. It would be unfortunate to write off all exercises as unsuitable or unsafe, and lose the opportunity to reap the benefits of exercises. Why not seek the advice of an NKF exercise specialist? There could be exercises that you can do safely. You just have to tailor the exercises to your health condition and circumstances.

The benefits of regular exercise are just too many to be covered on this page. Here are a few to fire you up. Exercise:

- ❑ gives you more energy
- ❑ makes you stronger
- ❑ improves your mood and quality of life
- ❑ reduces stress and helps you sleep
- ❑ helps your digestion and prevents excessive weight gain

- ❑ helps control blood pressure
- ❑ reduces cholesterol levels and your chance of developing heart disease
- ❑ strengthens your heart and bones
- ❑ helps reduce your blood sugar
- ❑ improves the efficiency of dialysis (for kidney patients)

## Do you know?

Overall, exercise makes you feel good! Our body releases endorphins during exercise. Endorphins are commonly linked to feelings of happiness.

## Watch and protect your body!

### Do not exercise

- ❑ after your dialysis as your blood pressure may be low.
- ❑ if you are feeling unwell.

Whenever in doubt, consult your doctor.

### When you exercise,

- ❑ execute movements in a slow and controlled manner.
- ❑ ensure full range of motion whenever possible.
- ❑ ensure normal breathing during exercising.
- ❑ engage abdominal, lower back and buttocks by tensioning whenever lifting up lower limbs.

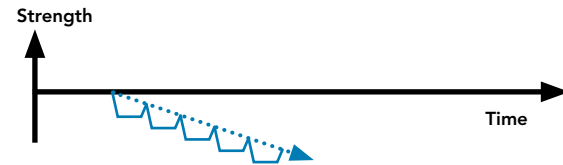
Whenever in doubt, consult your NKF exercise specialist.

## Introducing F-I-T-T

### Breaking it down:

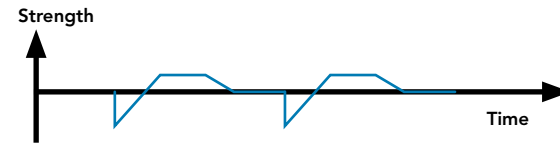
Frequency (F)	=	the number of times a physical activity is done each week
Intensity (I)	=	the level of difficulty of the physical activity (light, moderate, vigorous)
Time (T)	=	the duration of the physical activity in minutes  Aim for 30 minutes a session
Type (T)	=	the kind of physical activity selected  Choose from a range of strength or aerobic activity

## Frequency



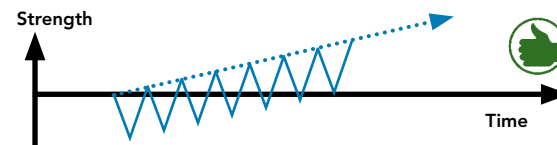
Indicates over-training. Before a recovery time of between 24 to 48 hours, the next training session commences.

- ❑ This results in a decreased level of strength over time.



Indicates under-training. Although there is an increased level of strength after the first training session, the lapse between two training sessions is too long.

- ❑ This results in no increase of strength over time.



Indicates good recovery between two training sessions. Allow 24 hours before your next training session.

- ❑ You will have an increased level of strength over time.

## How hard should you exercise?



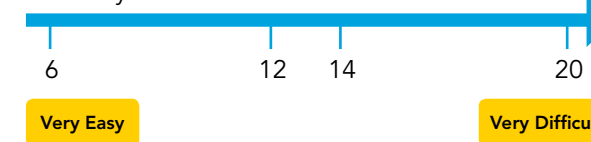
### a) Gauging intensity with Borg Rating of Perceived Exertion Scale (BRPE)

This is a simple but effective tool to measure exercise intensity after a sustained period of exercise. For instance, after you have done a 20-minute walk on the treadmill, you can rate how you feel and use this as a feedback for future sessions. If the rating is '6', you could consider walking at a faster pace in your next session.

#### Ranges from 6 to 20

6 : Very easy

20: Very exhausted and could do no more



Aim between 12 to 14: Steady exercising pace.



### b) Exercise and the heart

Exercise generates physical exertion on your body, and causes the heart to beat faster. If the heart beat is in a healthy, safe and effective target heart rate zone, this means that you have achieved the right level of exertion.

The most direct way to know this is by measuring your heart beat.

But first, let's take a look at a key term called Heart Rate Maximum, or  $HR_{max}$  in short.

$$HR_{max} = 220 - \text{Age}$$

If you are 60 years old, your  $HR_{max}$  would be  $220 - 60 = 160$  beats per minute.

As heartbeats generate pulses in the arteries, your pulses can act as a gauge of your heart rhythm. Read on to discover ways to take pulses.



**Radial Pulse**

- ❑ Place pads of two fingers on the inside of the wrist, just below the wrist creases at the base of the thumb.
- ❑ Press lightly till you feel a pulse. If needed, move fingers around till you feel the pulse.

**Brachial Pulse**

- ❑ Place pads of two fingers on the inside of the upper arm, just above the elbow creases.
- ❑ Press lightly till you feel a pulse. If needed, move fingers around till you feel the pulse.



**Carotid Pulse**

- ❑ Place pads of two fingers on either side of the neck.
- ❑ Press lightly till you feel a pulse. If needed, move fingers around till you feel the pulse.



Whichever way you use, note down the pulse beats in a minute.

Then calculate your heart rate:

$$\text{Heart rate} = \frac{\text{pulse beats per minute}}{\text{HR}_{\text{max}}} \times 100\%$$

This rate will guide you in adjusting the intensity (%) of the exercises you do. As a rule of thumb:

Heart rate should not exceed 80%

If it breaches this mark, you may consider doing less or slowing down the next time round. Consult your NKF physician or exercise specialist if in doubt.

**Recommended exercise intensity for apparently healthy adults**

Physical Activity/Exercise Level	Heart Rate Maximum (%)	Perception of Effort
Sedentary/no habitual activity or exercise/ extremely deconditioned	57 – 67%	Light – Moderate
Minimal physical activity/no exercise/ moderately-high deconditioned	64 – 74%	Light – Moderate
Sporadic physical activity/no or suboptimal exercise/moderately to mildly deconditioned	74 – 84%	Moderate – High
Habitual physical activity/regular moderate to vigorous intensity exercise <b>(*Not to be attempted by patients on renal dialysis)</b>	80 – 91%	Moderate – High
High amounts of habitual activity/regular vigorous intensity exercise <b>(*Not to be attempted by patients on renal dialysis)</b>	84 – 94%	Somewhat hard – Hard

**NOTE:**

- Individuals with medical conditions should consult a registered medical practioner before attempting to intensify their exercise efforts.
- These recommendations are consistent with the United States Department of Health & Human Services Physical Activity Guidelines for American. Adapted from ACSM’s Guidelines for Exercise Testing and Prescription (8th Ed).





# Get Set

You are very close to embark on an exciting journey. Before that, please fill in the following form to ensure that you are ready to start.

## PAR-Q & YOU

(A questionnaire for people aged 15 to 69)

YES

NO

1. Has your doctor ever said that you have a heart condition and that you should only do physical activity recommended by a doctor?
2. Do you feel pain in your chest when you do physical activity?
3. In the past month, have you had chest pain when you were not doing physical activity?
4. Do you lose your balance because of dizziness or do you ever lose consciousness?
5. Do you have a bone or joint problem (for example, back, knee or hip) that could be made worse by a change in your physical activity?
6. Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?
7. Do you know of any other reason why you should not do physical activity?

If you answered **YES to one or more questions**, talk to your doctor BEFORE you start becoming much more physically active or BEFORE you take part in a fitness appraisal. Tell your doctor about the PAR-Q and which questions you answered YES to.

- ❑ You may be able to do any activity you want as long as you start slowly and build up gradually. Or, you may need to restrict your activities to those which are safe for you. Talk with your doctor about the kinds of activities you wish to participate in and follow his/her advice.
- ❑ Find out which community programmes are safe and helpful for you.

**Delay becoming much more active:** If you are not feeling well because of a temporary illness such as a cold or a fever – wait until you feel better; or if you are or may be pregnant – talk to your doctor before you start becoming more active.

**Please note:** If your health changes so that you then answer **YES** to any of the above questions, tell your fitness or health professional. Ask whether you should change your physical activity plan.

If you answered **NO honestly to all the questions**, you can be reasonably sure that you can:

- ❑ Start becoming much more physically active – begin slowly and build up gradually. This is the safest and easiest way to go.
- ❑ Take part in a fitness appraisal – this is an excellent way to determine your basic fitness so that you can plan the best way for you to live actively. It is also highly recommended that you have your blood pressure evaluated. If the reading is over 144/94, talk to your doctor before you start becoming much more physically active.

**Informed use of the PAR-Q:** The Canadian Society for Exercise Physiology, Health Canada, and their agents assume no liability for persons who undertake physical activity, and if in doubt after completing this questionnaire, consult your doctor prior to physical activity.

**NOTE:** This physical activity clearance is valid for a maximum of 12 months from the date it is completed and becomes invalid if your condition changes so that you would answer **YES** to any of the seven questions.



## Signing in!

Fill up your information below:

Name : \_\_\_\_\_

Age : \_\_\_\_\_

BMI : \_\_\_\_\_  
[Weight (kg)/Height (m) x Height (m)]

"This one step – choosing a goal and sticking to it – changes everything."  
~ Scott Reed

### GOAL SETTING

My Goal: \_\_\_\_\_  
\_\_\_\_\_

Weight isn't just a number on a scale. It can be a signal of chronic diseases like hypertension, diabetes and certain types of cancer.

BMI (kg/m <sup>2</sup> )	Health Risk
Below 18.5	At high risk of developing nutritional deficiency and osteoporosis
18.5 – 22.9	Ideal range. At low risk of developing nutritional deficiency, osteoporosis and chronic diseases
23.0 – 27.4	At moderate risk of developing chronic diseases
Above 27.5	At high risk of developing chronic diseases

## My Daily Log

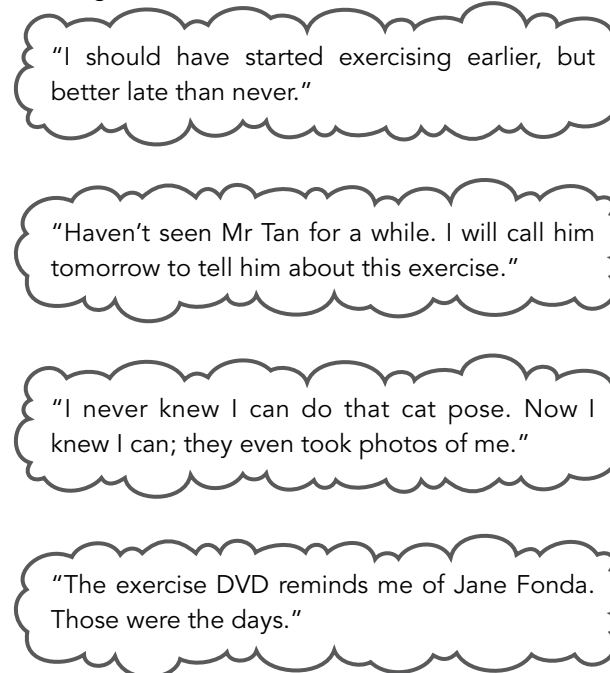
Now that you are raring to go, here's a resource that you can use during your exercise days.

Write your thoughts and feelings on the Daily Log after exercising.

'Feelings' can be:



'Thoughts' can be:

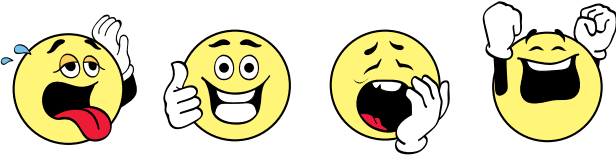


My Daily Log

	Monday	Tuesday	Wednesday	Thursday	Friday
WEEK 1					
WEEK 2					
WEEK 3					
WEEK 4					
WEEK 5					

Saturday	Sunday

Don't restrict yourself to just words; you can use emoticons to indicate your feelings.



\*A sample log is included at the back of the book. You can make copies for your use.

- Why keep a log? A log helps you
- ❑ to be more attuned to your body, feelings and thoughts after exercising.
  - ❑ to identify certain patterns and issues in exercising. You can share this information with someone else who may be able to help you address these issues. For instance, if you are constantly exhausted, there's a possibility that you are over exerting yourself.
  - ❑ challenge yourself further. A record in the log is proof that you have exercised.



# Go! The 7 Hues of Health at a Glance

Stage 2 to Stage 6:

Aim for 2 to 3 times a week.

Progression should be gradual. Two months is about right, before moving to the next stage.

Start

(Stretching Exercises)



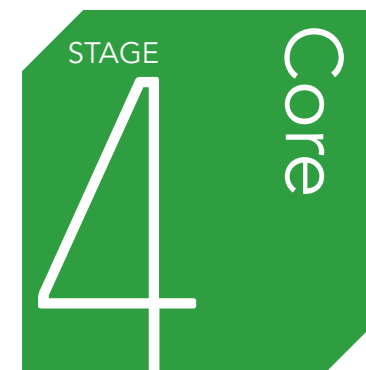
Walking



Muscle Activation Exercises



Strength Exercises



Core Stabilisation Exercises



Strength Exercises (With Weights)



Dynamic Core Stabilisation Exercises



Cardiorespiratory Exercises

- These are low-intensity exercises which you should aim to do every day.
- Do these exercises before each exercise session to warm up your body.
- Do a minimum of 1 to 3 times for each exercise; each stretch should last 15 to 60 seconds.

## CAUTION:

If you are on haemodialysis,  
– avoid doing exercises from Stage 2 to 7 on dialysis days.  
– do not do any of the exercises if you have a permanent catheter as movements may cause catheter damage.

If you are on peritoneal dialysis,  
– do not do exercises from Stage 4 and 6 as the movements may cause catheter damage.



# Stretching Exercises



## Benefits:

Stretching exercises improve range of motion and physical function, hence are critical in countering the loss of motion with ageing.

Stretching should be performed up to just before discomfort sets in within the range of motion, and not any further. This will be perceived as the point of mild tightness of the muscle, without discomfort.

In this section, we introduce you to exercises that help stretch key muscle groups.



## Dose:

- ❑ Minimum 1 to 3 times for each exercise
- ❑ Each stretch should last 15 to 60 seconds



## CAUTION:

- Stretch slowly and smoothly without bouncing or jerking.
- Breathe normally; do not hold your breath.
- You should be in control of each movement and breathing.

## 1) Neck stretch, up and down



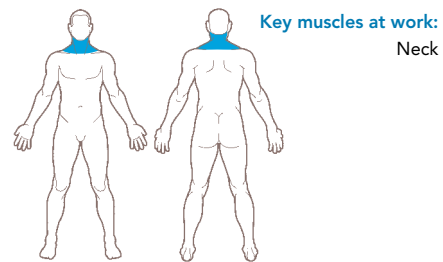
### Start position:

- ▶ Sit upright, looking straight ahead



### Action:

- ▶ Lift head, hold for 15 seconds
- ▶ Lower chin towards chest, hold for 15 seconds
- ▶ Return to start position



1



2



3

Start

## 2) Head turn, right and left



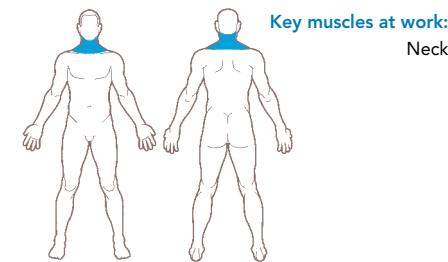
### Start position:

- ▶ Sit upright, looking straight ahead



### Action:

- ▶ Turn head, hold for 15 seconds
- ▶ Return to start position
- ▶ Repeat on the other side



1



2



3

Start

### 3) Neck stretch, diagonal



#### Start position:

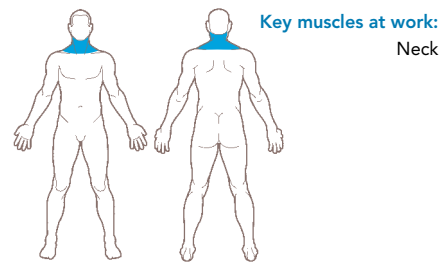
- ▶ Sit upright, looking straight ahead



#### Action:

- ▶ Turn head diagonally up to your right, hold for 15 seconds

- ▶ Move head diagonally down to your left, hold for 15 seconds
- ▶ Turn head diagonally up to your left, hold for 15 seconds
- ▶ Move head diagonally down to your right, hold for 15 seconds
- ▶ Return to start position



Start

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5

### 4) Shoulder shrug



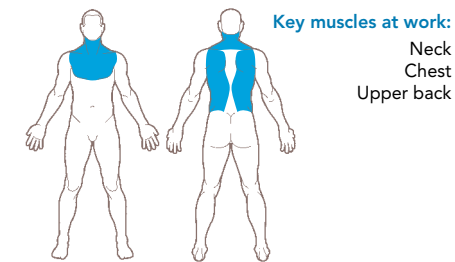
#### Start position:

- ▶ Sit upright, looking straight ahead
- ▶ Relax shoulders



#### Action:

- ▶ Lift shoulders towards ears, hold for 15 seconds
- ▶ Return to start position



Start

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2

## 5) Upper back and chest stretch



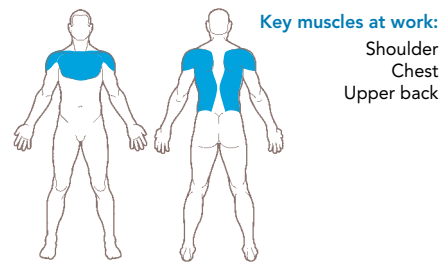
### Start position:

- ▶ Sit upright, looking straight ahead
- ▶ Place hands on shoulders, elbows out to the side



### Action:

- ▶ Touch elbows in front of chest, hold for 15 seconds
- ▶ Move elbows out again, squeeze shoulder blades, hold for 15 seconds
- ▶ Return to start position



1



2



3

Start

## 6) Arm stretch and wrist rotation



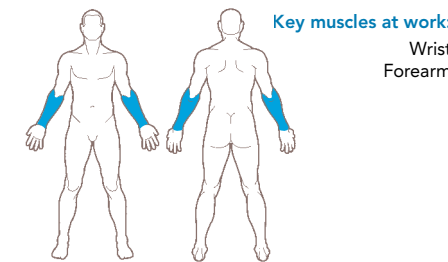
### Start position:

- ▶ Sit upright, looking straight ahead
- ▶ Raise arms straight to the front at shoulder level
- ▶ Clench fists



### Action:

- ▶ Draw small circles with wrists for 15 seconds
- ▶ Repeat in the other direction



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2



3

Start



## 7) Side trunk stretch



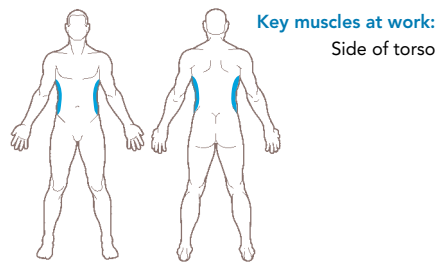
### Start position:

- ▶ Sit upright, looking straight ahead
- ▶ Stretch hands up above head



### Action:

- ▶ Lean over, feel a gentle stretch down on left side
- ▶ Hold for 15 seconds
- ▶ Return to start position
- ▶ Repeat on the other side



1



2



3

Start

## 8) Back thigh stretch



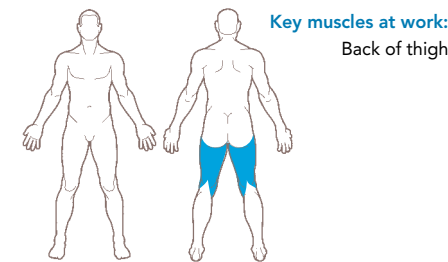
### Start position:

- ▶ Sit upright, looking straight ahead



### Action:

- ▶ Pull knee towards chest, hold with both hands
- ▶ Hold as close as possible to chest for 15 seconds
- ▶ Return to start position
- ▶ Repeat on the other knee



1



2



3

Start

## 9) Front thigh stretch



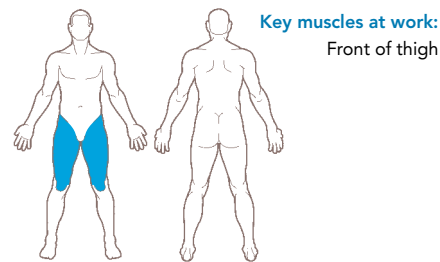
### Start position:

- ▶ Stand upright, hold on to a support



### Action:

- ▶ Hold ankle from the back, keeping knees together
- ▶ Hold for 15 seconds
- ▶ Return to start position
- ▶ Repeat on the other side



1



2



3



4

Start

## 10) Calf stretch



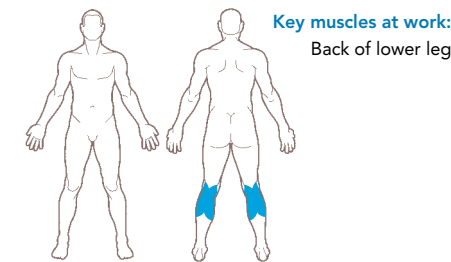
### Start position:

- ▶ Stand upright, hold on to a support
- ▶ Step right leg straight back, press heel firmly onto the floor



### Action:

- ▶ Lean forward and bend front leg, do not bend right leg
- ▶ Hold for 15 seconds
- ▶ Return to start position
- ▶ Repeat on the other side



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2



3



4

Start

## 11) Seated outer thigh stretch



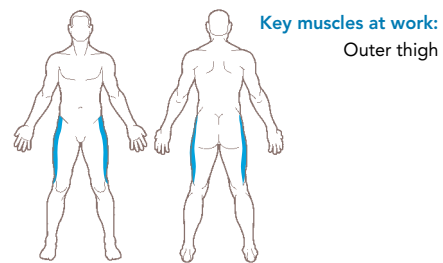
### Start position:

- ▶ Sit upright, place ankle on thigh, near kneecap.



### Action:

- ▶ With back straight, hinge forward till there is a mild stretch on right buttock, hip and outer thigh
- ▶ Hold for 15 seconds
- ▶ Return to start position
- ▶ Repeat on the other side



1



2



3



4

Start

## 12) Seated inner thigh stretch



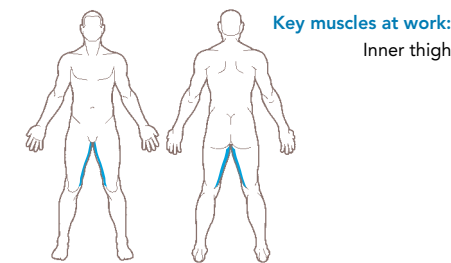
### Start position:

- ▶ Sit upright, bend both knees, soles of the feet together



### Action:

- ▶ Place elbows on both legs, apply a slight pressure by pressing downwards
- ▶ Hold for 15 seconds
- ▶ Return to start position



1



2

Start



### RED Symbolises Determination and Passion

The decision to start doing and get going can be a challenging one to make. Overcoming this inertia takes a degree of determination and a desire for improvements. May that desire bloom into passion that keeps you going. You made the right decision.

"Due to the handicap in my lower limbs and stiffness on my back, I am at Stage 1. However, I am contented. I think I have shown improvements since starting physical rehabilitation with NKF's exercise specialists. They have given me lots of encouragement. I am physically and psychologically fitter now."

Masillamany Munusamy | Age 67 | Dialysis Centre: Woodlands 2



## Walking

Walking may seem routine and almost mundane. Yet it has many health benefits.

Walking facilitates the flow of air in and out of the lungs and stimulates the heart to supply blood to muscles, thereby keeping the heart fit. It has shown to help lower blood pressure.

The lower limbs stand to benefit most from the movements.

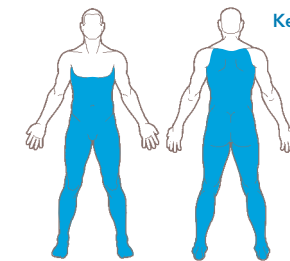
Regular walking keeps weight at bay; a sedentary lifestyle on the other hand, can lead to weight gain, obesity and a higher risk of diabetes, stroke and heart disease.

Walking benefits mental health too. When one is walking, the body releases



'feel-good' chemicals called endorphins which help one feel better about himself.

Many people tend to ruminate; their minds are occupied thinking about past events, and the future. Walking encourages one to focus on the present. When you walk down the street, look at the way the light reflects off the buildings, hear the rustle of the leaves, and take notice of all that's around you. Be amazed at the new insights you can get!



Key muscles at work:

Torso  
Buttock  
Lower body





### ORANGE Symbolises Perseverance and Endurance

You have made the first crossing from Stage 1 to Stage 2. Abraham Lincoln said: "I am a slow walker but I never walk back." It does not matter how slowly you go as long as you do not stop. Our muscles only get stronger if we are moving and our blood pumping. So make more crossings!

"Before I started exercising, I was worried that I may not be able to climb the stairs. I am more confident now, having conquered the fear and doing what I previously thought was not possible."



Sakyah Bte Sapari | Age 64 | Dialysis Centre: Pasir Ris



# Muscle Activation Exercises

Our muscles are activated through nerve impulses. Nerve impulses 'power up' the muscles, causing muscles to contract. This process enables the movements that we rely on to perform tasks, big and small.

The exercises in Stage 2 facilitate this process of muscle activation. Performed regularly, these could help to build muscle strength.



### CAUTION:

- Do movements in a slow and controlled manner.
- Engage your torso by tensioning the mid-section muscles.
- Do not hold your breath. Breathe normally.
- Have one day of rest in between strength training sessions.

## 1) Knee raise



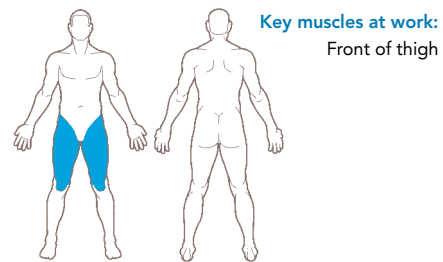
### Start position:

- ▶ Sit upright with legs shoulder-width apart



### Action:

- ▶ Lift your knee towards chest, without bending torso
- ▶ Hold for 15 seconds
- ▶ Return to start position
- ▶ Repeat on the other leg



1



2



3

Start

## 2) Hip adduction



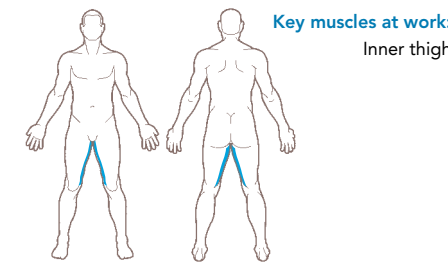
### Start position:

- ▶ Sit upright with pillow placed between knees



### Action:

- ▶ Squeeze legs together
- ▶ Hold for 15 seconds
- ▶ Return to start position



1



2

Start



### 3) Hip abduction



#### Start position:

- ▶ Sit upright with a towel tied around your thighs

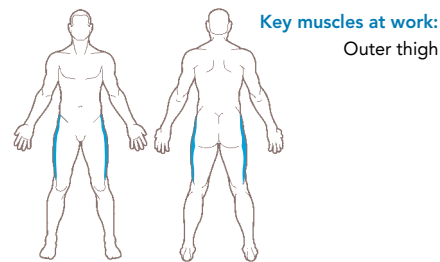


#### Action:

- ▶ Open legs laterally against the resistance
- ▶ Hold for 15 seconds
- ▶ Return to start position



**Note:** Tie towel firmly, but with enough space for outward movements of thighs



1



2

Start

### 4) Lower leg extension



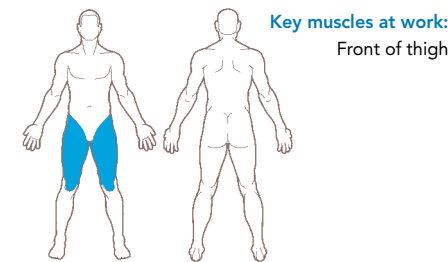
#### Start position:

- ▶ Sit upright with both feet flat on the floor
- ▶ Hold onto the side of the seat for support



#### Action:

- ▶ Lift leg off the floor, straighten leg
- ▶ Hold for 15 seconds
- ▶ Return to start position
- ▶ Repeat on the other leg



1



2



3



4

Start



## 5) Hip kickback



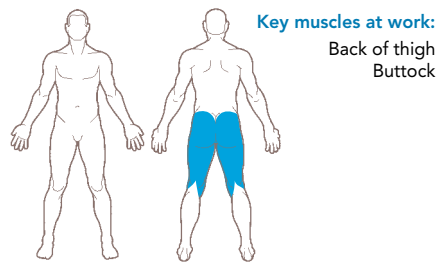
### Start position:

- ▶ Stand upright with legs shoulder-width apart, hold on to a support



### Action:

- ▶ Keeping back straight, bring one leg behind, pointing your toes downwards
- ▶ Hold for 15 seconds
- ▶ Return to start position
- ▶ Repeat on the other leg



1



2



3



4

Start

## 6) Supported heel raise



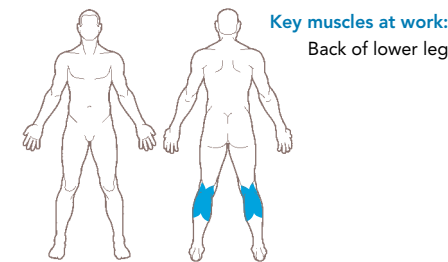
### Start position:

- ▶ Stand upright with legs shoulder-width apart, hold on to a support



### Action:

- ▶ Lift heels of both legs and stand on the balls of feet
- ▶ Hold for 15 seconds
- ▶ Return to start position



1



2

Start

## 7) Supported side lunge



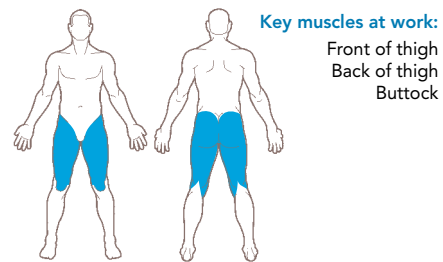
### Start position:

- ▶ Stand upright with legs shoulder-width apart, hold on to a support



### Action:

- ▶ Take a 45-degree step out
- ▶ Bend as low as possible
- ▶ Hold for 15 seconds
- ▶ Return to start position
- ▶ Repeat on the other leg



1



2



3

Start

## Quizzes

How accurate are the following statements?  
Decide for yourself whether it's a **Yes**, **No**, or **Maybe**.



- I have missed a few exercise sessions. I should continue at a lower intensity. ●●●
- I should update my daily log diligently to beautify it. ●●●
- Doing household chores can be considered a physical activity. ●●●
- Regular exercise can help to prevent weight gain. ●●●
- I can exercise just before my dialysis session. ●●●
- It is best to dress in sports attire when exercising. ●●●
- If I can't feel my pulse, I should move my fingers around till I feel it. ●●●
- Stretching causes my body to become longer. ●●●
- I can achieve good overall strength by doing a combination of resistance exercises that target various parts of the body. ●●●
- When I exercise, I feel tired. ●●●

When you are ready, turn to page 89 for the answers.



### YELLOW Symbolises Energy and Orderliness

By now, your muscles would have been sufficiently powered up. You begin to see an improvement in energy levels. Exercising, if it is to give maximum benefits, should be done consistently and systematically, in an orderly fashion. Continue on, step by step, to learn more exercises.

"Getting up from a sitting position is much easier now. I am ready to gain more strength!"



Omar Bin Sulaiman | Age 68 | Dialysis Centre: Hougang 2



## Strength Exercises

Strength exercises put muscles to work against some kind of resistance. Acts such as pulling open a heavy door, and pushing to remove a heavy object are examples.

Performed regularly, these exercises strengthen your muscles and bone, improve your posture and help to prevent diseases like osteoporosis. To achieve good overall strength, do a combination of exercises that target various parts of the body.



### CAUTION:

- Do movements in a slow and controlled manner.
- Engage your torso by tensioning the mid-section muscles.
- Do not hold your breath. Breathe normally.
- Have one day of rest in between strength training sessions.

## 1) Arm curl



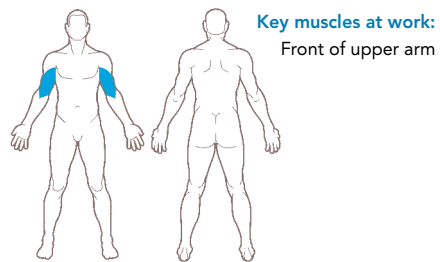
### Start position:

- ▶ Sit upright with arms straightened, elbows close to body



### Action:

- ▶ Bend elbows, bring hands towards shoulders
- ▶ Do 1 set of 15 repetitions
- ▶ Return to start position



1



2

Start

## 2) Shoulder press



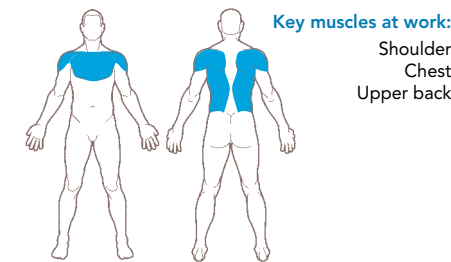
### Start position:

- ▶ Sit upright with arms raised, elbows bent at 90 degrees to upper arms



### Action:

- ▶ Push arms straight up into the air
- ▶ Do 1 set of 15 repetitions
- ▶ Return to start position



1



2

Start

### 3) Side shoulder raise



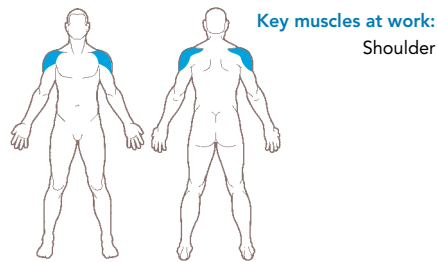
#### Start position:

- ▶ Sit upright with arms straightened, elbows close to body



#### Action:

- ▶ Raise arms out to the side till shoulder level
- ▶ Do 1 set of 15 repetitions
- ▶ Return to start position



1



2

Start

### 4) Front shoulder raise



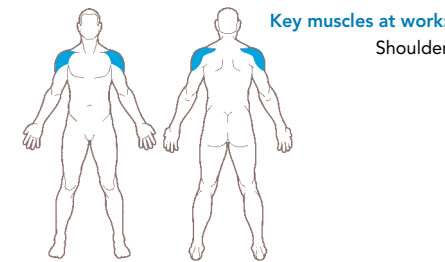
#### Start position:

- ▶ Sit upright with arms straightened, elbows close to body



#### Action:

- ▶ Raise arms towards the front till shoulder level
- ▶ Do 1 set of 15 repetitions
- ▶ Return to start position



1



2

Start

## 5) Arm extension



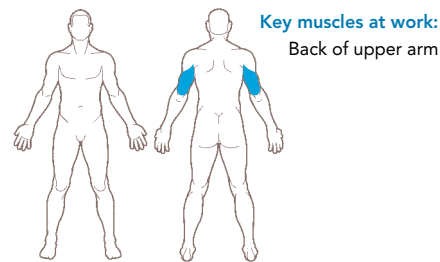
### Start position:

- ▶ Sit upright with one arm flexed behind head, the other arm supporting elbow



### Action:

- ▶ Straighten elbow
- ▶ Do 1 set of 15 repetitions
- ▶ Return to start position
- ▶ Repeat on the other arm



1



2



3



4

Start

## 6) Wall push-up



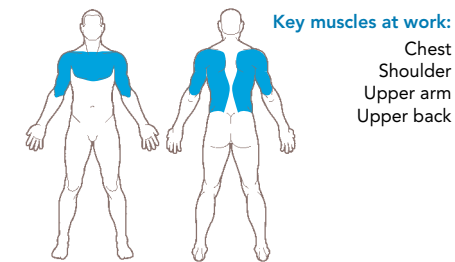
### Start position:

- ▶ Stand upright facing wall
- ▶ Place both hands on wall at shoulder level, with extended elbows



### Action:

- ▶ Bend elbows and lean forward
- ▶ Do 1 set of 15 repetitions
- ▶ Return to start position by pushing away from the wall till body is upright



1



2

Start



## 7) Curl-up



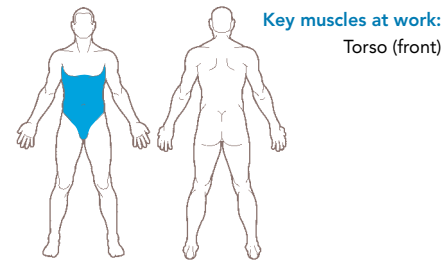
### Start position:

- ▶ Lie supine on the floor with knees bent
- ▶ Cross arms in front of chest



### Action:

- ▶ Curl head and shoulders till shoulders are off the ground
- ▶ Do 1 set of 15 repetitions
- ▶ Return to start position



1



2

Start

## 8) Chair squat



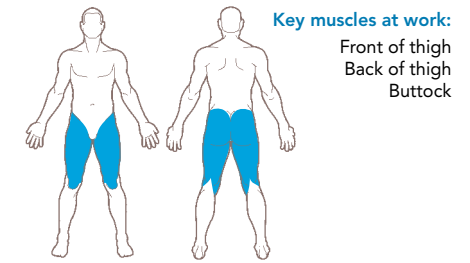
### Start position:

- ▶ Stand in front of a sturdy chair, legs shoulder-width apart



### Action:

- ▶ Squat down till body is slightly above chair surface
- ▶ Do 1 set of 15 repetitions
- ▶ Return to start position



1



2

Start





### GREEN Symbolises Growth and Abundance

Green is the colour of grass. Given the right conditions, grass sprouts in abundance. This handbook, abound with ideas and tips, will keep you motivated to grow in knowledge and willpower to carry on exercising.

"Exercise relieves my muscle stiffness. I used to have backaches before I started exercising. I am glad that I am feeling better now."



Geraldine Goh | Age 55 | Dialysis Centre: Kim Keat



## Core Stabilisation Exercises

Our core muscles that run the entire length of the torso serve as a muscular corset. When these muscles contract, they stabilise the spine, pelvis and shoulder girdle, a process that enables us to move our extremities (hands and feet).

Core muscle weaknesses have also been shown to be associated with low back pain. Hence, training the core muscles could remedy this weakness. Core stabilisation exercises can be attempted progressively, from beginner level to more advanced levels. It can help promote good posture and prevent injury.



### CAUTION:

- Do movements in a slow and controlled manner.
- Engage your torso by tensioning the mid-section muscles.
- Do not hold your breath. Breathe normally.
- Have one day of rest in between strength training sessions.

## 1) Trunk arch



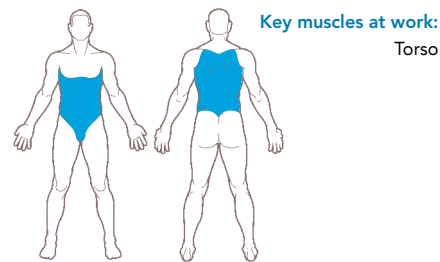
### Start position:

- ▶ Kneel on the floor with hands and knees shoulder-width apart



### Action:

- ▶ Lock hips
- ▶ Flex torso, hold for 15 seconds
- ▶ Hyper-extend torso, hold for 15 seconds
- ▶ Return to start position



1



2



3

Start

## 2) Hip extension



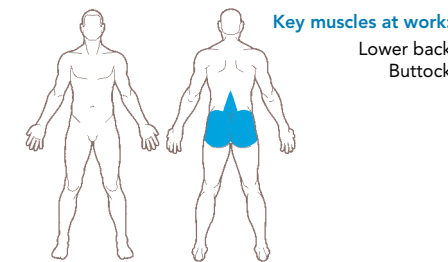
### Start position:

- ▶ Lie prone, elbows bent beside shoulders, palms facing down



### Action:

- ▶ Lift chest off the ground
- ▶ Hold for 15 seconds
- ▶ Return to start position



1



2

Start

### 3) Prone bridge



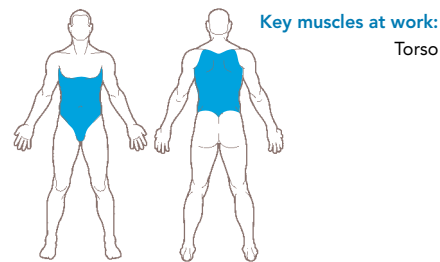
#### Start position:

- ▶ Lie prone, elbows below shoulders, fingers interlocked



#### Action:

- ▶ Lift upper body, knees and toes on the ground
- ▶ Form a 'plank' position
- ▶ Hold for 15 seconds
- ▶ Return to start position



1



2

Start

### 4) Side bridge



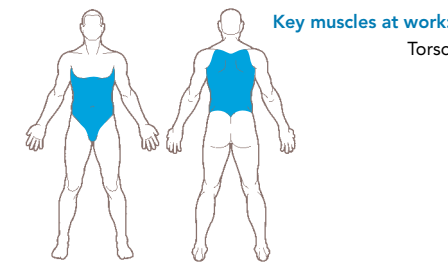
#### Start position:

- ▶ Lie on side, elbow bent on the ground
- ▶ Use arm underneath as cushion, the other hand for support



#### Action:

- ▶ Lift body, using the other hand for support
- ▶ Keep back straight
- ▶ Hold for 15 seconds
- ▶ Return to start position
- ▶ Repeat on the other side



1



2



3

Start

## 5) Side leg lift



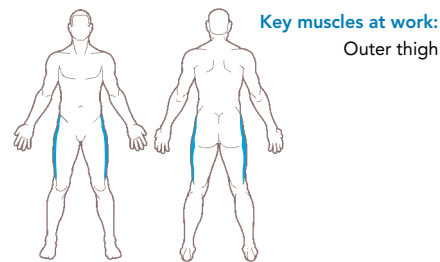
### Start position:

- ▶ Lie on side, legs on top of one another
- ▶ Use arm underneath to cushion head, the other hand for support



### Action:

- ▶ Lift up top leg
- ▶ Hold for 15 seconds
- ▶ Return to start position
- ▶ Repeat on the other side



1



2



3

Start

## 6) Supine bridge



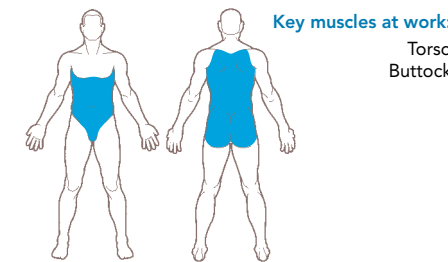
### Start position:

- ▶ Lie supine, arms at the side
- ▶ Bend knees, place feet firmly on the floor



### Action:

- ▶ Raise hips, until a straight line is formed from knees to shoulders
- ▶ Hold for 15 seconds
- ▶ Return to start position



1



2

Start

## 7) Curl-up



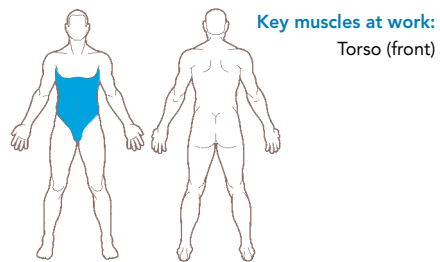
### Start position:

- ▶ Lie supine, cross arms on chest, lower legs at right angles with thighs ('table-top' position)



### Action:

- ▶ Lift shoulders off the ground
- ▶ Hold for 15 seconds
- ▶ Return to start position



Start

1

2

## 8) Lying leg extension



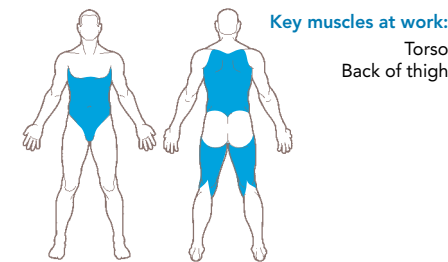
### Start position:

- ▶ Lie supine, arms at the side, legs at right angles with thighs ('table-top' position)



### Action:

- ▶ Extend and straighten leg
- ▶ Hold for 15 seconds
- ▶ Return to start position
- ▶ Repeat on the other leg



Start

1

2

3



### Blue Symbolises Peace, Stability and Harmony

These three attributes are a great reminder that exercises should never be abrupt. Throughout the handbook, we emphasise controlled movements performed in a slow and orderly fashion. Your body should be in a stable position, postures should not be awkward, and there should not be pain.

"Exercise increases my quality of life and independence as I get older. I am able to walk longer distance and duration. I also have fewer cramps on my legs."



Foo Chee Peng | Age 58 | Dialysis Centre: Kim Keat



## Strength Exercises with Weights

These exercises are the more challenging variations of Stage 3 exercises to improve muscle strength. They are great examples of resistance training combined with creativity!

You do not need special equipment. Household items are perfect for these exercises. Here are some ideas:

- ❑ Canned food
- ❑ Bags of rice/beans
- ❑ Water tumblers or mineral water bottles. Pour different amount of liquid and you have different weights.



### CAUTION

- Do movements in a slow and controlled manner.
- Engage your torso by tensioning the mid-section muscles.
- Do not hold your breath. Breathe normally.
- Have one day of rest in between strength training sessions.

## 1) Arm curl with weights



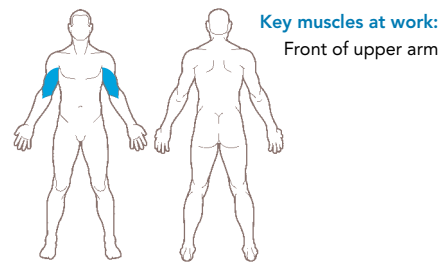
### Start position:

- ▶ Stand upright, arms straightened, elbows close to body
- ▶ Hold weights, palms facing body



### Action:

- ▶ Bend elbows, bring hands towards shoulders
- ▶ Do 1 set of 15 repetitions
- ▶ Return to start position



1



2

Start

## 2) Shoulder press with weights



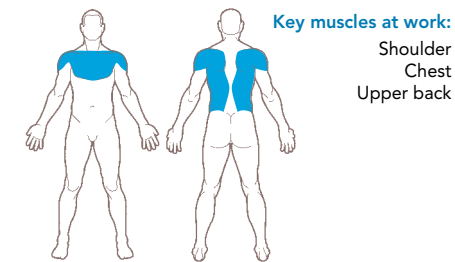
### Start position:

- ▶ Stand upright, arms raised, elbows bent at 90 degrees to upper arms



### Action:

- ▶ Push arms straight up into the air
- ▶ Do 1 set of 15 repetitions
- ▶ Return to start position



1



2

Start



### 3) Side shoulder raise with weights



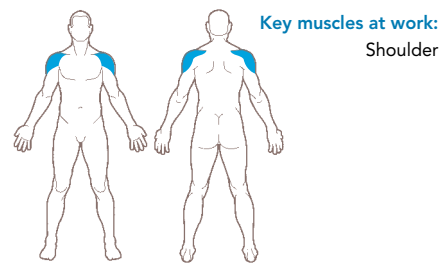
#### Start position:

- ▶ Stand upright, elbows close to body, weights in hands



#### Action:

- ▶ Raise arms out to the side till shoulder level
- ▶ Do 1 set of 15 repetitions
- ▶ Return to start position



1



2

Start

### 4) Front shoulder raise with weights



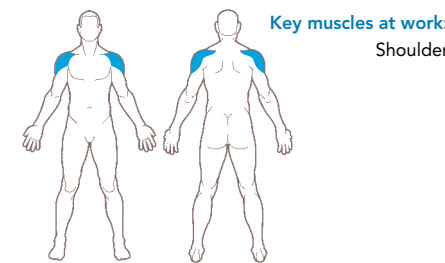
#### Start position:

- ▶ Stand upright, elbows close to body, weights in hands



#### Action:

- ▶ Raise arms towards the front till shoulder level
- ▶ Do 1 set of 15 repetitions
- ▶ Return to start position



1



2

Start

## 5) Arm extension with weights



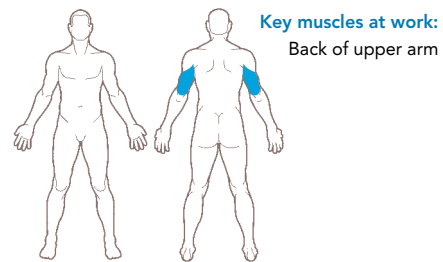
### Start position:

- ▶ Stand upright with one arm flexed behind head, the other hand supporting elbow



### Action:

- ▶ Straighten elbow
- ▶ Do 1 set of 15 repetitions
- ▶ Return to start position
- ▶ Repeat on the other arm



1



2



3

Start

## 6) Upright row with weights



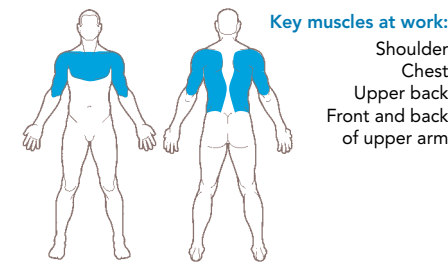
### Start position:

- ▶ Stand upright, legs shoulder-width apart
- ▶ Hold weights in both hands side by side



### Action:

- ▶ Bend elbows, lift weights to chest level
- ▶ Do 1 set of 15 repetitions
- ▶ Return to start position



1



2

Start

## 7) Squat with weights



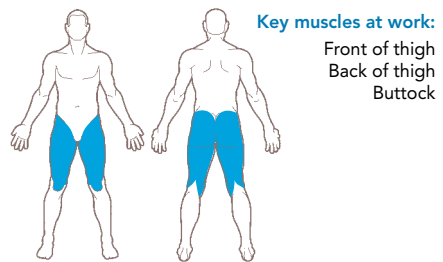
### Start position:

- ▶ Stand upright, legs shoulder-width apart



### Action:

- ▶ Squat down, with arms at the side
- ▶ Do 1 set of 15 repetitions
- ▶ Return to start position



1



2

Start

## 8) Lunge with weights



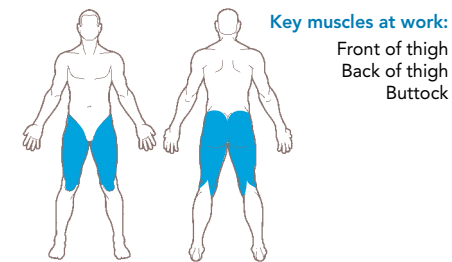
### Start position:

- ▶ Stand upright, legs shoulder-width apart
- ▶ Step one leg out to the front



### Action:

- ▶ Bend front knee
- ▶ Do 1 set of 15 repetitions
- ▶ Return to start position
- ▶ Repeat on the other leg



1



2



3

Start



### INDIGO Symbolises Abilities, Wisdom and Dignity

It takes determination and abilities to come this far. As you master the more challenging exercises, encourage yourself by taking note of and celebrating your achievements. We all need a healthy dose of pride, and wisdom will ensure that we do not overdose on it!

“Hurray! I no longer have dizzy spells. I used to have them very often. I think the static mat exercises really helped me. I am much fitter now. My stamina has definitely improved and I don’t fall sick easily anymore.”



Margaret Lam | Age 59 | Dialysis Centre: Clementi



## Dynamic Core Stabilisation Exercises

Like Stage 4, these exercises work the core muscles. The word ‘dynamic’ refers to movements of the body. By regularly training to keep the trunk steady while moving a part of the body, the core is strengthened gradually.



### CAUTION

- Do movements in a slow and controlled manner.
- Engage your torso by tensioning the mid-section muscles.
- Do not hold your breath. Breathe normally.
- Have one day of rest in between strength training sessions.

## 1) Four-point alternating pulses



### Start position:

- ▶ Kneel on the floor with hands and knees shoulder-width apart



### Action:

- ▶ Raise one arm, do 15 pulses
- ▶ Return to start position
- ▶ Repeat on the other arm
- ▶ Return to start position



1

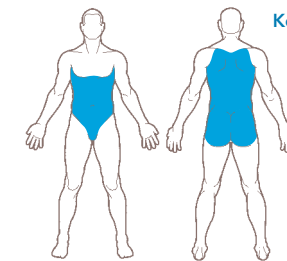


2



3

Start



Key muscles at work:

Torso  
Buttock

## 1) Four-point alternating pulses (cont'd)

- ▶ Raise one leg, do 15 pulses
- ▶ Return to start position
- ▶ Repeat on the other leg
- ▶ Return to start position
- ▶ Do 1 set of 15 repetitions



4



5



6

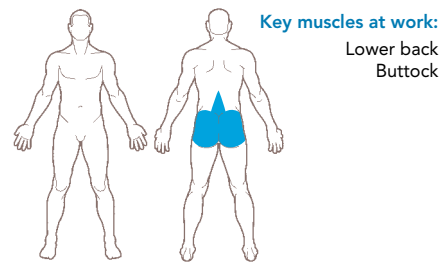
## 2) Hip extension

### Start position:

- ▶ Lie prone, elbows bent beside shoulders
- ▶ Clench fists beside ear, elbows facing out

### Action:

- ▶ Lift chest off the ground
- ▶ Do 1 set of 15 repetitions
- ▶ Return to start position



1



2

Start

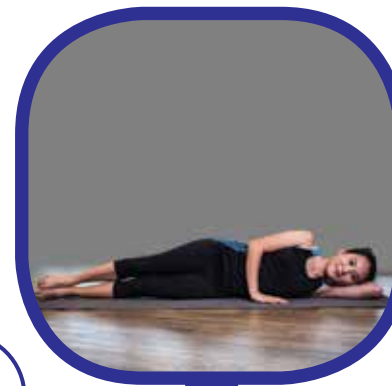
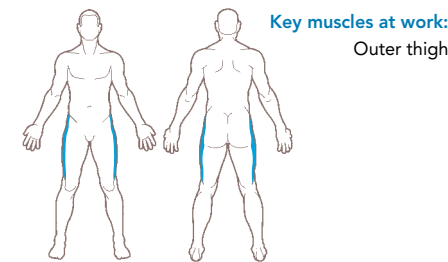
## 3) Side leg lift

### Start position:

- ▶ Lie on side with legs on top of one another
- ▶ Use arm underneath to cushion head, the other arm for support

### Action:

- ▶ Lift up top leg
- ▶ Do 1 set of 15 repetitions
- ▶ Return to start position
- ▶ Repeat on the other side



1



2



3

Start

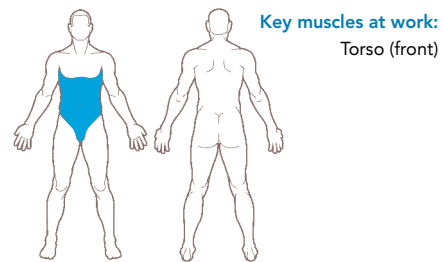
## 4) Curl-up

### Start position:

- ▶ Lie supine, cross arms on chest, lower legs at right angles with thighs ('table-top' position)

### Action:

- ▶ Lift shoulders off the ground
- ▶ Do 1 set of 15 repetitions
- ▶ Return to start position



1



2

Start

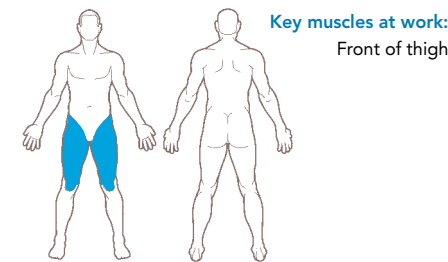
## 5) Lying leg raise

### Start position:

- ▶ Lie supine, flex leg, foot firmly on the ground
- ▶ Extend the other leg

### Action:

- ▶ Lift leg as high as possible
- ▶ Do 1 set of 15 repetitions
- ▶ Return to start position
- ▶ Repeat on the other side



1



2



3

Start



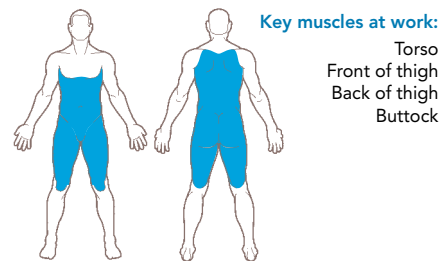
## 6) Lying leg extension

### Start position:

- ▶ Lie supine, lower legs at right angles with thighs ('table-top' position)

### Action:

- ▶ Extend one leg
- ▶ Do 1 set of 15 repetitions
- ▶ Return to start position
- ▶ Repeat on the other leg



1



2



3

Start

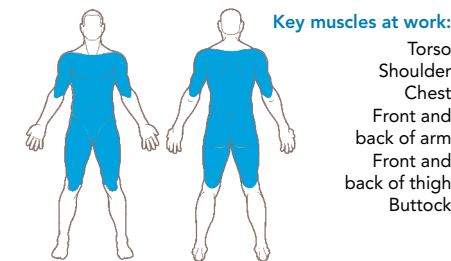
## 7) Lying hand and leg extension

### Start position:

- ▶ Lie supine, lower legs at right angles with thighs ('table-top' position) with boxing stance

### Action:

- ▶ Extend hand and leg on one side, with a curl-up
- ▶ Do 1 set of 15 repetitions
- ▶ Return to start position
- ▶ Repeat on the other side



1



2



3

Start

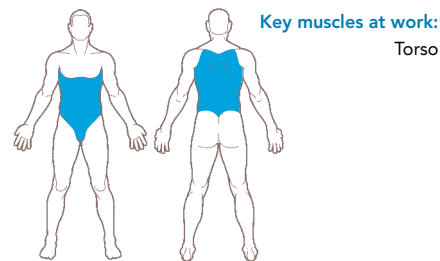
## 8) Lying pulses

### Start position:

- ▷ Lie supine, with arms at the side
- ▷ Lift both legs 10 cm off the ground

### Action:

- ▷ Raise one leg, then the other; continue alternating the two
- ▷ Do 1 set of 30 to 50 pulses
- ▷ Return to start position



1



2



3

Start

## Answers

Quizzes (from page 47).

1. I have missed a few exercise sessions. I should continue at a lower intensity.  
**Yes!** There is no harm to start again at a lower intensity. Slow and steady wins the race.
2. I should update my daily log diligently to beautify it.  
**No!** Regular updating of the log helps you see the improvements over time and motivates you to carry on exercising.
3. Doing household chores can be considered a physical activity.  
**Maybe.** Doing household chores facilitates bodily movements. However, you may not reach the right intensity for a healthy heart.
4. Regular exercise can help to prevent weight gain.  
**Yes!** Weight control is determined by the sum total energy use and calories consumed. When you exercise, you use up calories.
5. I can exercise just before my dialysis session.  
**Maybe.** You may exercise if you feel well and fit. Consult your NKF physician or exercise specialist if unsure.
6. It is best to dress in sports attire when exercising.  
**Maybe.** The most important consideration is comfort. Loose clothing allows you to have a wider range of motion.
7. If I can't feel my pulse, I should move my fingers around till I feel it.  
**Yes!** Practice makes perfect and patience does the trick. Your pulse is always there.
8. Stretching causes my body to become longer.  
**No!** The reason for doing stretching exercises is to warm up your body and to promote flexibility.
9. I can achieve good overall strength by doing a combination of resistance exercises that target various parts of the body.  
**Yes!** When done correctly, resistance exercises improve all components of muscular fitness – strength, endurance and power.
10. When I exercise, I feel tired.  
**Maybe.** This could be due to the body trying to react to a new stimulus. Over time, as adaptation kicks in, the threshold of your tiredness will increase.



### VIOLET Symbolises Love and Attainment

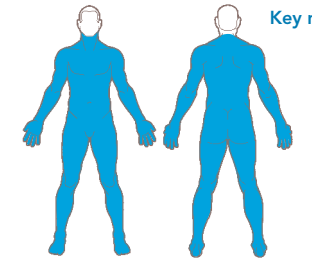
Exercising boosts physiological and psychological well-being. It is an act of 'self-love', where you take action to nourish yourself through healthy activities. You attain a state where you are perfectly at ease with yourself. You begin to accept your weaknesses, without trying too hard to explain away every shortcoming. You are compassionate towards fellow human beings in this same journey to attain purpose and meaning.

"I feel stronger now. As we get older, our muscles and joints get stiffer. Therefore, we exercise to be more flexible and we must do it every day. Now, I am more agile and I am able to play basketball and swim."

Alex Verghese | Age 77 | Dialysis Centre: Ang Mo Kio 2



## Cardiorespiratory Exercises



Key muscles at work:  
Whole body

Congratulations for coming this far!  
Journey on the final lap to build endurance.

Endurance activities strengthen the heart and lungs and improve blood circulation.



They boost energy levels. Activities such as brisk walking, aerobic workout and recreational sports are some examples.

When you perform such exercises/activities, large muscle groups are put to work. The heart pumps faster to supply oxygen to the muscles. You should exercise to an intensity that is between 12 to 14 according to the Borg Rating of Perceived Exertion Scale (see page 11). At this level, the pulse rate is increased and the breathing is quicker, but you are still able to have a conversation with someone while exercising.



## CAUTION

- Start with light-intensity exercises before progressing to activities of higher intensity. This helps prevent or minimise muscle soreness.

Well done!

You have come a long way. How do you feel?

Exercising with a friend or in groups makes exercise sessions more fun. Your regular exercise partner can be an accountability buddy too, and you can be his buddy in turn, to encourage each other to stay on track in achieving exercise targets.

## Certificate of Fitness

Congratulations on your graduation!  
You have successfully completed all the seven stages  
of the Rainbow Exercise Programme.

You are now fit to do any of the exercises  
in this book whenever you wish.

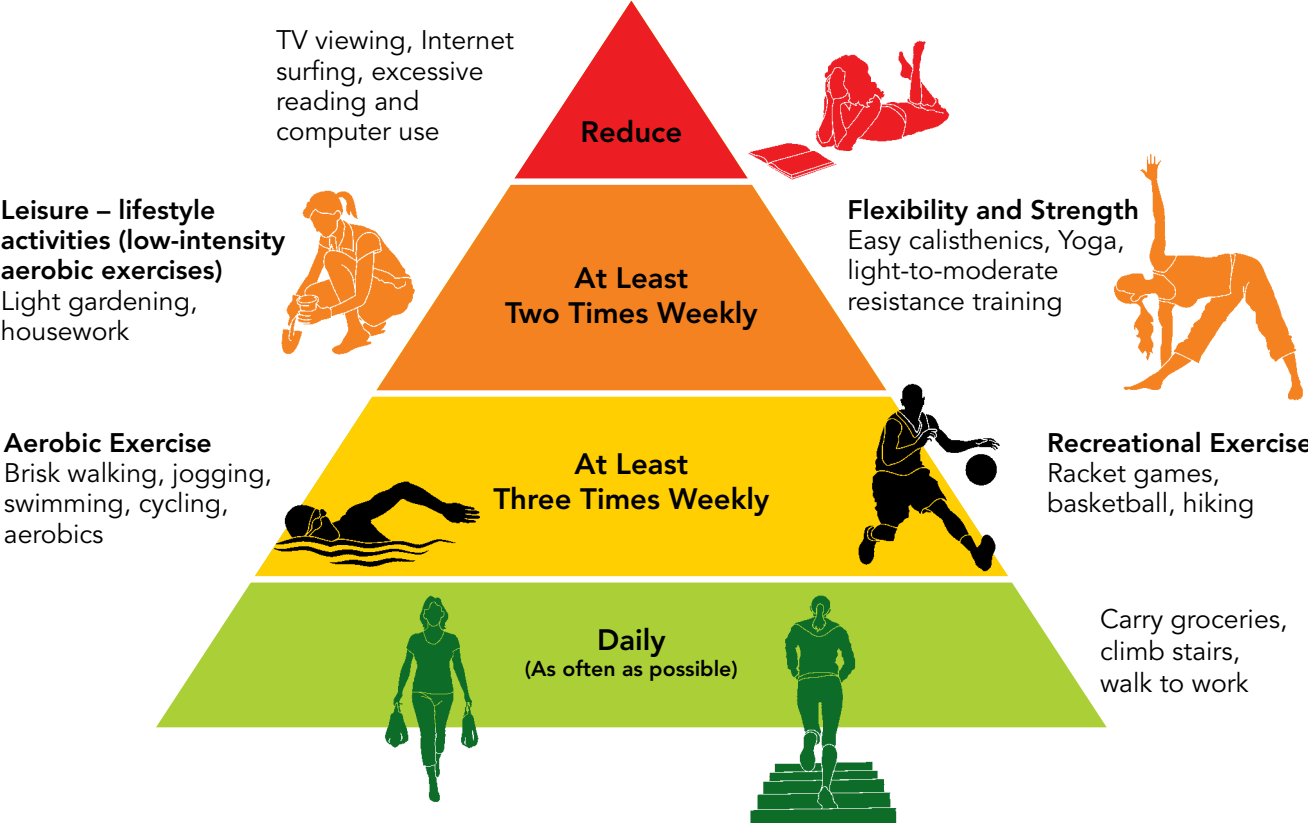
If you have any questions, please feel free  
to consult an NKF exercise specialist.

My Daily Log

	Mon	Tue	Wed	Thurs	Fri	Sat	Sun
WEEK 1							
WEEK 2							
WEEK 3							
WEEK 4							
WEEK 5							

Information on the use of the daily log is found on page 17, *Hues of Health*, an NKF publication (2014).

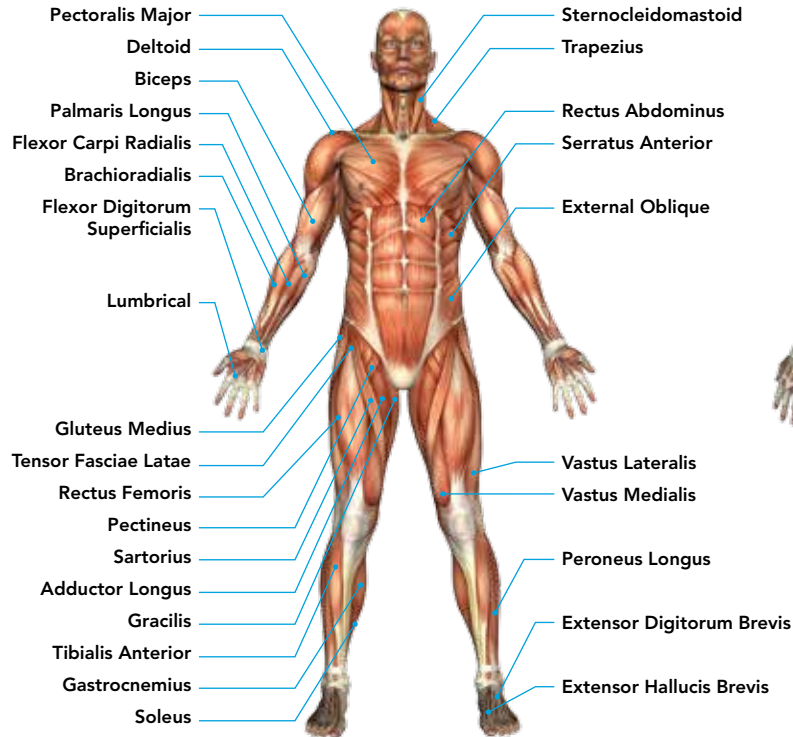
Physical Activity Pyramid





# The Human Muscular Anatomy

## Anterior View



## Posterior View

