

# Exercise program

## **GLA:D®** KNEE/HIP

SDU  **GLA:D®**

NAME \_\_\_\_\_



# Pain registration

## EXERCISE DIARY

### REGISTRATION OF PAIN DURING EXERCISE

Exercise-induced pain is common. Please register the pain intensity you feel in the table below. Use the pain scale of 0-10 to assess your pain during and after each training session. Zero indicates the absence of pain, while 10 represents the most intense pain possible.

A pain intensity score above 5 will often call for an adjustment of the exercises in consultation with your physiotherapist. Intensified pain lasting longer than 24 hours after a training session also indicates that your program needs to be adjusted. Your physiotherapist may help you.



#### WEEK 1

##### 1ST SESSION

Pain



Date

##### 2ND SESSION

Pain



Date

#### WEEK 2

##### 1ST SESSION

Pain



Date

##### 2ND SESSION

Pain



Date

#### WEEK 3

##### 1ST SESSION

Pain



Date

##### 2ND SESSION

Pain



Date

#### WEEK 4

##### 1ST SESSION

Pain



Date

##### 2ND SESSION

Pain



Date

#### WEEK 5

##### 1ST SESSION

Pain



Date

##### 2ND SESSION

Pain



Date

#### WEEK 6

##### 1ST SESSION

Pain



Date

##### 2ND SESSION

Pain



Date

OPTIONAL, EXTENDED PROGRAM - WEEK 7 & 8

#### WEEK 7

##### 1ST SESSION

Pain



Date

##### 2ND SESSION

Pain



Date

#### WEEK 8

##### 1ST SESSION

Pain



Date

##### 2ND SESSION

Pain



Date

# The exercise program

# **CONTENTS**

## THE EXERCISE PROGRAM CONSISTS OF THE FOLLOWING ELEMENTS:

- **Warm up**
- **Core stability**  
Exercises that focus on core/spine stability as this affects a person's ability to stabilize and control his or her hip and knee joints.
- **Alignment of joints**  
Exercises that focus on an appropriate position of the joints in relation to each other, i.e. that the hip, knee and ankle joints are properly aligned (see picture).
- **Leg strength**  
Exercises that focus on strengthening the hip and knee muscles
- **Functional exercises**  
Exercises that prepare the body for daily activities
- **Walking exercise/Cool down/Stretching**



## EXERCISE PRINCIPLES

Each exercise consists of 2-3 sets of 10-15 repetitions and rest corresponding to one set between each set and exercise. Each exercise can be progressed through four different levels. The exercises are performed with both the affected and the unaffected leg. Some of the exercises should be performed in front of a mirror to get a visual feedback of the performance. It is important that the hip, knee and ankle joints are properly aligned (see picture). A GLA:D® program lasts for at least 6 weeks (12 training sessions) and is supervised by a physiotherapist. The exercise diary allows you to register up to 8 weeks.

The exercise program has been designed on the basis of Ageberg et al. Feasibility of neuromuscular training in patients with severe hip or knee OA: The individualized goal-based NEMEX-TJR training program. BMC Musculoskeletal Disorders, 2010. Photographer: Jørn Ungstrup

# The program

## **WARM UP**

### **THE WARM UP CONSISTS OF 10 MINUTES OF STATIONARY CYCLING**

Warm-up consists of ergometer cycling for 10 minutes. The work load is set individually and can be increased during the 10 minutes, aiming at reaching a perceived exertion of “somewhat hard”. The height of the saddle must be adjusted so that the knee cannot be fully extended.

Warm-up is important as the discomfort associated with OA tends to subside with movement. Also, a good warm up will get your muscles ready for action and lubricate your joints. Exercising will be easier when you are warmed up.



# Exercise 1A Pelvic lift



## Level 1

Lie on your back with your legs resting on top of the gym ball. Short lever arm. Spread your arms out to your sides. Lift your hips off the floor and push your hips toward the ceiling, then go back to the starting position. Avoid exaggerated lumbar curve.

## Level 2

Same as level 1, but with a longer lever arm so that only your heels are resting on top of the ball. Be careful not to overextend your knees when you lift your hips off the floor.

## Level 3

Single leg pelvic lift. Be careful not to over-extend your knee and control your pelvic tilt. Perform the exercise for both legs.

## Level 4

Pelvic lift with your arms across your chest. The exercise can be done with one or both legs on the gym ball. Be careful not to over-extend your knees and control your pelvic tilt.

### WEEK 1

#### 1ST SESSION

Level

1 2 3 4

Reps

### WEEK 2

#### 1ST SESSION

Level

1 2 3 4

Reps

### WEEK 3

#### 1ST SESSION

Level

1 2 3 4

Reps

### WEEK 4

#### 1ST SESSION

Level

1 2 3 4

Reps

### WEEK 5

#### 1ST SESSION

Level

1 2 3 4

Reps

### WEEK 6

#### 1ST SESSION

Level

1 2 3 4

Reps

### WEEK 7

#### 1ST SESSION

Level

1 2 3 4

Reps

### WEEK 8

#### 1ST SESSION

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1 2 3 4

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Level

1 2 3 4

Reps

OPTIONAL, EXTENDED PROGRAM WEEK 7 & 8

#### 2ND SESSION

Level

1 2 3 4

Reps

#### 2ND SESSION

Level

1 2 3 4

Reps

# Exercise **1B** Sit-ups



## Level 1

Lie on your back, calves on top of the gym ball and arms straight forward. Roll your shoulder blades up and lower yourself back down after a short pause.



## Level 2

Lie on your back, calves on top of the gym ball and arms across your chest. Roll your shoulder blades up and lower yourself back down after a short pause.



## Level 3

Lie on your back, calves on top of the gym ball and hands behind your neck. Roll your shoulder blades up and lower yourself back down after a short pause. Place your hands by your ears to avoid straining your neck.



## Level 4

Lie on your back, calves on top of the gym ball. Roll your shoulder blades up and lower yourself back down after a short pause while holding hand weights.

### WEEK 1

#### 1ST SESSION

Level

① ② ③ ④

Reps

### WEEK 2

#### 1ST SESSION

Level

① ② ③ ④

Reps

### WEEK 3

#### 1ST SESSION

Level

① ② ③ ④

Reps

### WEEK 4

#### 1ST SESSION

Level

① ② ③ ④

Reps

### WEEK 5

#### 1ST SESSION

Level

① ② ③ ④

Reps

### WEEK 6

#### 1ST SESSION

Level

① ② ③ ④

Reps

OPTIONAL, EXTENDED PROGRAM WEEK 7 & 8

### WEEK 7

#### 1ST SESSION

Level

① ② ③ ④

Reps

### WEEK 8

#### 1ST SESSION

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#### 2ND SESSION

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Reps

#### 2ND SESSION

Level

① ② ③ ④

Reps

# Exercise **2A** Backward sliding lunges



**Level 1**  
 Standing position, weight-bearing on one leg, other leg on sliding surface. Slide backwards while bending the knee of the weight-bearing leg, then slowly return to the starting position. Ensure proper alignment of hip, knee and ankle joints. Use hand support for balance if needed.



**Level 2**  
 Same as level 1, but standing on uneven surface with weight-bearing leg (e.g. foam pillow or thick mattress). Use hand support for balance if needed.



**Level 3**  
 Standing position, take a large step forward, bend the knee of the step-out leg while ensuring proper alignment of hip, knee and ankle joints, then push yourself back to the starting position.



**Level 4**  
 Same as level 3, but holding hand weights.

WEEK 1		WEEK 2		WEEK 3		WEEK 4		WEEK 5		WEEK 6		WEEK 7		WEEK 8	
1ST SESSION		1ST SESSION		1ST SESSION		1ST SESSION		1ST SESSION		1ST SESSION		1ST SESSION		1ST SESSION	
Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level
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OPTIONAL, EXTENDED PROGRAM WEEK 7 & 8

# Exercise **2B** Sideways sliding lunges



**Level 1**  
Standing position, weight-bearing on one leg, other leg on sliding surface. Slide Sideways while bending the knee of the weight-bearing leg, then slowly return to the starting position. Ensure proper alignment of hip, knee and ankle joints. Use hand support for balance if needed.

**Level 2**  
Same as level 1, but standing on uneven surface with weight-bearing leg (e.g. foam pillow or thick mattress). Use hand support for balance if needed.

**Level 3**  
Standing position, take a large step to the side, bend the knee of the step-out leg while ensuring proper alignment of hip, knee and ankle joints, then push yourself back to the starting position.

**Level 4**  
Same as level 3, but with resistance band around your ankles.

## WEEK 1

### 1ST SESSION

Level

① ② ③ ④

Reps

## WEEK 2

### 1ST SESSION

Level

① ② ③ ④

Reps

## WEEK 3

### 1ST SESSION

Level

① ② ③ ④

Reps

## WEEK 4

### 1ST SESSION

Level

① ② ③ ④

Reps

## WEEK 5

### 1ST SESSION

Level

① ② ③ ④

Reps

## WEEK 6

### 1ST SESSION

Level

① ② ③ ④

Reps

## WEEK 7

### 1ST SESSION

Level

① ② ③ ④

Reps

## WEEK 8

### 1ST SESSION

Level

① ② ③ ④

Reps

### 2ND SESSION

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Reps

OPTIONAL, EXTENDED PROGRAM WEEK 7 & 8

### 2ND SESSION

Level

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Reps

### 2ND SESSION

Level

① ② ③ ④

Reps



# Exercise **3A** Hip abductors



**Level 1**  
 Standing with light resistance band in tension, lift your outer leg up and straight out to the side as far as possible and stretch the band. Keep stance leg and torso stable, do not lean forward or to the side and do not twist your body. Be careful not to overextend the weight-bearing knee.

**Level 2**  
 Same as level 1, but with medium or heavy resistance band.

**Level 3**  
 Same as level 1-2, but standing on uneven surface (e.g. foam pillow or thick mattress).

**Level 4**  
 Standing with a resistance band tied together in a circle around your ankles and weight-bearing on one leg. Lift your other leg up and straight out to the side as far as possible while keeping stance leg and torso stable. To progress the exercise, try standing on a foam pillow.

WEEK 1		WEEK 2		WEEK 3		WEEK 4		WEEK 5		WEEK 6		WEEK 7		WEEK 8	
<b>1ST SESSION</b>		<b>1ST SESSION</b>		<b>1ST SESSION</b>		<b>1ST SESSION</b>		<b>1ST SESSION</b>		<b>1ST SESSION</b>		<b>1ST SESSION</b>		<b>1ST SESSION</b>	
Level		Level		Level		Level		Level		Level		Level		Level	
① ② ③ ④		① ② ③ ④		① ② ③ ④		① ② ③ ④		① ② ③ ④		① ② ③ ④		① ② ③ ④		① ② ③ ④	
Reps		Reps		Reps		Reps		Reps		Reps		Reps		Reps	
<b>2ND SESSION</b>		<b>2ND SESSION</b>		<b>2ND SESSION</b>		<b>2ND SESSION</b>		<b>2ND SESSION</b>		<b>2ND SESSION</b>		<b>2ND SESSION</b>		<b>2ND SESSION</b>	
Level		Level		Level		Level		Level		Level		Level		Level	
① ② ③ ④		① ② ③ ④		① ② ③ ④		① ② ③ ④		① ② ③ ④		① ② ③ ④		① ② ③ ④		① ② ③ ④	
Reps		Reps		Reps		Reps		Reps		Reps		Reps		Reps	

OPTIONAL, EXTENDED PROGRAM WEEK 7 & 8

# Exercise **3B** Hip adductors



## Level 1

Standing on one leg with light resistance band around the other leg. Pull your leg in towards the weight-bearing leg against the resistance of the band. Keep stance leg and torso stable, do not lean forward or to the side and do not twist your body. Be careful not to overextend the weight-bearing knee.

## Level 2

Same as level 1, but with medium or heavy resistance band.

## Level 3

Same as level 1-2, but standing on uneven surface (e.g. foam pillow or thick mattress).

## Level 4

Lie down on one side, resting on your elbow and forearm. Place your upper leg on the chair while resting your lower leg on the floor. Raise the lower leg towards the bottom of the chair against gravity. Hold for a few seconds and return your leg to the floor. To progress the exercise, try moving further away from the chair so that only your foot is placed on the chair.

### WEEK 1

#### 1ST SESSION

Level

① ② ③ ④

Reps

### WEEK 2

#### 1ST SESSION

Level

① ② ③ ④

Reps

### WEEK 3

#### 1ST SESSION

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Reps

### WEEK 4

#### 1ST SESSION

Level

① ② ③ ④

Reps

### WEEK 5

#### 1ST SESSION

Level

① ② ③ ④

Reps

### WEEK 6

#### 1ST SESSION

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① ② ③ ④

Reps

### WEEK 7

#### 1ST SESSION

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① ② ③ ④

Reps

### WEEK 8

#### 1ST SESSION

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① ② ③ ④

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#### 2ND SESSION

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① ② ③ ④

Reps

OPTIONAL, EXTENDED PROGRAM WEEK 7 & 8

#### 2ND SESSION

Level

① ② ③ ④

Reps

#### 2ND SESSION

Level

① ② ③ ④

Reps

# Exercise **4A** Knee flexors



## Level 1

Sitting position. Light resistance band around one foot. Sit at the front of the chair to allow full range of movement when bending and straightening your knee. Pull the leg backwards against the resistance of the band and bend your knee.

## Level 2

Use medium resistance band.

## Level 3

Use heavy resistance band.

## Level 4

Use extra heavy resistance band.

### WEEK 1

#### 1ST SESSION

Level

① ② ③ ④

Reps

### WEEK 2

#### 1ST SESSION

Level

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Reps

### WEEK 3

#### 1ST SESSION

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① ② ③ ④

Reps

### WEEK 4

#### 1ST SESSION

Level

① ② ③ ④

Reps

### WEEK 5

#### 1ST SESSION

Level

① ② ③ ④

Reps

### WEEK 6

#### 1ST SESSION

Level

① ② ③ ④

Reps

### WEEK 7

#### 1ST SESSION

Level

① ② ③ ④

Reps

### WEEK 8

#### 1ST SESSION

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① ② ③ ④

Reps

OPTIONAL, EXTENDED PROGRAM WEEK 7 & 8

#### 2ND SESSION

Level

① ② ③ ④

Reps

#### 2ND SESSION

Level

① ② ③ ④

Reps

# Exercise **4B** Knee extensors



**Level 1**  
Place the center of a resistance band under one foot and hold an end in each hand. Bend and straighten your knee against the resistance of the band while keeping your hands still.

**Level 2**  
Sitting position with light resistance band around one foot (see picture). Push resistance band forward by extending your knee.

**Level 3**  
Use medium resistance band.

**Level 4**  
Use heavy resistance band.

**WEEK 1**

**1ST SESSION**

Level

- 1
- 2
- 3
- 4

Reps

**2ND SESSION**

Level

- 1
- 2
- 3
- 4

Reps

**WEEK 2**

**1ST SESSION**

Level

- 1
- 2
- 3
- 4

Reps

**2ND SESSION**

Level

- 1
- 2
- 3
- 4

Reps

**WEEK 3**

**1ST SESSION**

Level

- 1
- 2
- 3
- 4

Reps

**2ND SESSION**

Level

- 1
- 2
- 3
- 4

Reps

**WEEK 4**

**1ST SESSION**

Level

- 1
- 2
- 3
- 4

Reps

**2ND SESSION**

Level

- 1
- 2
- 3
- 4

Reps

**WEEK 5**

**1ST SESSION**

Level

- 1
- 2
- 3
- 4

Reps

**2ND SESSION**

Level

- 1
- 2
- 3
- 4

Reps

**WEEK 6**

**1ST SESSION**

Level

- 1
- 2
- 3
- 4

Reps

**2ND SESSION**

Level

- 1
- 2
- 3
- 4

Reps

**OPTIONAL, EXTENDED PROGRAM WEEK 7 & 8**

**WEEK 7**

**1ST SESSION**

Level

- 1
- 2
- 3
- 4

Reps

**2ND SESSION**

Level

- 1
- 2
- 3
- 4

Reps

**WEEK 8**

**1ST SESSION**

Level

- 1
- 2
- 3
- 4

Reps

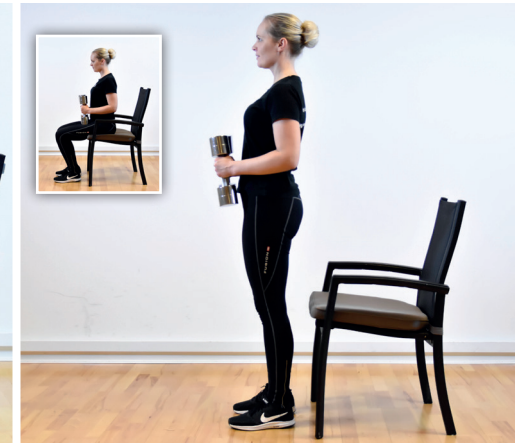
**2ND SESSION**

Level

- 1
- 2
- 3
- 4

Reps

# Exercise **5A** Chair stands



## Level 1

Start in a seated position, feet parallel and shoulder-width apart, putting load on both legs. Slight hand support for balance. Stand up while ensuring proper alignment of hip, knee and ankle joints. Do not let yourself collapse back down into the chair. Rather, control your lowering as much as possible.

## Level 2

Same as level 1, but without hand support.

## Level 3

Perform the exercise with one foot in front of the other. This exercise is a single leg standup exercise with weight-bearing and focus on your back leg. Perform the exercise for both legs.

## Level 4

Perform the exercise while holding hand weights. Keep your elbows at a 90 degree angle.

### WEEK 1

#### 1ST SESSION

Level

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Reps

### WEEK 2

#### 1ST SESSION

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Reps

### WEEK 3

#### 1ST SESSION

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### WEEK 4

#### 1ST SESSION

Level

① ② ③ ④

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### WEEK 5

#### 1ST SESSION

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Reps

### WEEK 6

#### 1ST SESSION

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Reps

### WEEK 7

#### 1ST SESSION

Level

① ② ③ ④

Reps

### WEEK 8

#### 1ST SESSION

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Level

① ② ③ ④

Reps

OPTIONAL, EXTENDED PROGRAM WEEK 7 & 8

#### 2ND SESSION

Level

① ② ③ ④

Reps

#### 2ND SESSION

Level

① ② ③ ④

Reps

# Exercise **5B** Step ups



## Level 1

Step up onto a low step board or stair with or without slight hand support for balance. Then step backward to the starting position. Ensure proper alignment of hip, knee and ankle joints.

## Level 2

Same as level 1, but using a medium step board.

## Level 3

Same as level 2, but using a high step board.

## Level 4

Step up onto the step board with one leg and step across and back again with your other leg.

### WEEK 1

#### 1ST SESSION

Level

① ② ③ ④

Reps

#### 2ND SESSION

Level

① ② ③ ④

Reps

### WEEK 2

#### 1ST SESSION

Level

① ② ③ ④

Reps

#### 2ND SESSION

Level

① ② ③ ④

Reps

### WEEK 3

#### 1ST SESSION

Level

① ② ③ ④

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#### 2ND SESSION

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Reps

### WEEK 4

#### 1ST SESSION

Level

① ② ③ ④

Reps

#### 2ND SESSION

Level

① ② ③ ④

Reps

### WEEK 5

#### 1ST SESSION

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① ② ③ ④

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#### 2ND SESSION

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① ② ③ ④

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### WEEK 6

#### 1ST SESSION

Level

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Reps

#### 2ND SESSION

Level

① ② ③ ④

Reps

OPTIONAL EXTENDED PROGRAM WEEK 7 & 8

### WEEK 7

#### 1ST SESSION

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Reps

#### 2ND SESSION

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Reps

### WEEK 8

#### 1ST SESSION

Level

① ② ③ ④

Reps

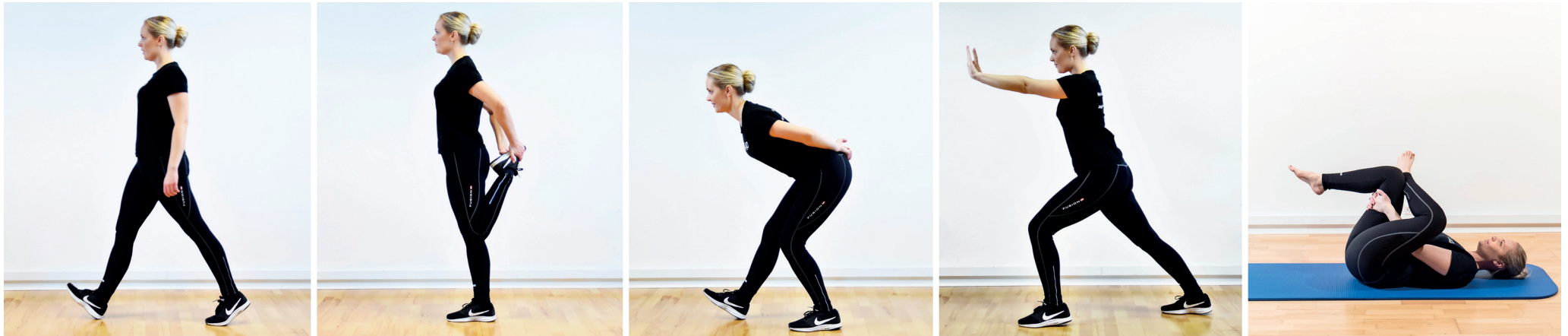
#### 2ND SESSION

Level

① ② ③ ④

Reps

# Walking exercise/Stretches



## WALKING EXERCISE

Walk forwards and backwards in front of a mirror with focus on proper alignment of the hip, knee and ankle joints.

## STRETCHES

Stretching of the major muscle groups of the lower extremities will increase flexibility. Hold the stretch for at least 20 seconds. For added support, stand by a wall or something to support yourself while doing the stretches. Focus on appropriate alignment of the hip, knee and ankle joints.