

# Leg skills for action

## Activities to improve strength, balance and agility

### Common difficulties experienced by children with DCD, dyspraxia, low tone and hypermobility

#### **Poor walking endurance**

The child may be unwilling to walk long distances and complain of being tired and their legs being sore. If the child's leg muscles are weak, they will tire very quickly and become uncomfortable. To improve

You can improve walking endurance by going on regular walks, increasing the distance and speed in a systematic fashion.

#### **Poor running endurance and speed**

Running speed and endurance can also be improved by strengthening the leg muscles.

Calf muscle strength is particularly important, as these muscles help to propel the body forwards. Weakness in the calf muscles results in the child running with the feet turned out or in a flat footed way.

Running endurance should also be improved by regularly going for runs of ever increasing distance.

Jumping activities are also good for increasing knee and calf muscle strength for running.

#### **Balance standing on one leg**

Standing on one leg requires strength in the hip muscles as well as the ability to make small movements of the foot to maintain balance.

Practising the different exercises that require the child to stand on one leg will improve strengthen the muscles and improve coordination and balance

#### **Jumping and hopping skills**

Children with movement difficulties often have poor jumping and hopping skills because of muscle weakness and poor endurance as well as poor coordination between the arms, trunk and legs when they jump.

Practising the different jumping activities will improve the child's basic jumping skills as well as improve their strength and endurance for walking and running.

#### **Standing heel-to-toe and walking on a balance beam**

These exercises challenge the child's balance skills.

### How to exercise to improve strength

In order to improve strength the child must work the muscles harder than he / she usually does – this requires effort and effort often involves a little discomfort. You will know when the child is getting tired – the movements become slower and less smooth and the child may start to make effort sort of noises. Generally speaking exercises should be adjusted so that the child starts to get tired after 10-12 repetitions of an exercise. This provides enough load on the muscles to get an adaptive strengthening response, without overloading the muscles and causing injury.

In these exercises the muscles of the legs work against the resistance provided by body weight – the body provides the load. The exercises can be made easier or more difficult by adjusting the exercise so that the load imposed on the leg muscles by the exercise is made more or less. If a child can only do a few repetitions of the exercise, then the load is too much, and the exercise needs to be adapted to decrease the load.

Some children tend to give up quite quickly when they experience the discomfort that goes with effort – so they need to be encouraged to work a little harder. I find it useful to have a discussion with the child about what it feels like to work really hard, emphasising that to make muscles stronger they need to work really hard, and that is what they are feeling when the muscles start to ache a little – it tells them that their muscles are working really hard.

You also need to encourage the child to put in the effort – get a bit enthusiastic, make a bit of a fuss about the fact that when they get tired they know their muscles are working really hard.

### Increasing endurance for walking

Some children do not develop endurance for walking distances – the child may complain that his/her legs hurt or that she is tired.

The main reason for a child not wanting to walk any distance is that walking, especially if you are not very fit, tires the legs. Any activity that requires effort causes sensations of effort that can be considered uncomfortable. But mostly one recognises effort sensations for what they are and keep going despite the discomfort. This is especially true if one is strongly motivated to achieve a goal. And off course the fitter one is for an activity, such as walking, the more one can do before sensations of effort becomes obvious.

Some children are very sensitive to any sensations of discomfort in the muscles and interpret them painful and will avoid doing activities that require effort.

So if a child complains about walking a distance there are three things that need to be done:

- 1 Assess flexibility of the legs to see if this is causing discomfort. Exercises to improve flexibility are helpful in this case.
- 2 Teach the child to recognise sensations of effort – and to tolerate and welcome them as a sign of hard work and achievement. For further information see the highly sensitive child
- 3 Increase fitness for walking by walking engaging in a regular walking programme .
- 4 Strengthen the leg muscles

### What the child should be able to do

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A child of 5 years and older should be able to stand up and sit down from a 15cm high step, 10 times.

#### Good control:

- Sits down to a slow count of four, stands up to slow count of 4.
- Thighs slightly apart and the feet facing forwards.

#### Poor control

- Sits down fast and lands on buttocks with a bump. Stands up very quickly.
- Thighs move sideways and the feet turn outwards as he stands up.
- Pushes with arms to get up

### Choosing a step or stool of the right height.

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To work the muscles effectively in this exercise, you need to choose a stool or step of the correct height. The child should be tired after doing 10-12 repetitions of the exercise. You know that the muscles are starting to get tired when the child starts to have difficulty coming up or sitting down and the movement is less smooth.

- Start by letting the child sit on a step or low stool. Count how many times the exercise can be done before the child shows signs of tiredness.
- If the exercise can be done 10 times – then the stool or step is the right height. If the child can repeat the exercise more than 15 times, the exercise is too easy and you need to find a stool that is lower.
- If the child can only do the exercise 5 or 6 times before you he gets tired, the exercise is too difficult and you need to use a slightly higher stool.

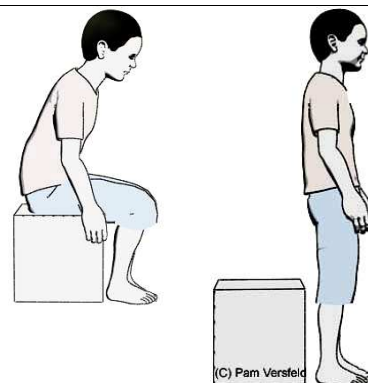
### Standing up from a high step

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#### Exercise instructions

Sit on a step or chair about 30 cm high. The feet should be facing forwards and about 15 cm apart.

- Stand up slowly to the count of 4 (4 second)s. Keep the feet still and not let them turn outwards.
- Sit down slowly to the count of 4 (4 seconds)
- Repeat 10 times



## Trunk Skills for Action

### Exercises to improve strength, stability and posture

#### What are the core stabilisers?

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The term “core stabilisers” refers to the deep abdominal and back muscles that work together to keep the trunk steady when the body is moved.

When the arms are lifted forwards the neck and abdominal core stabilisers contract even before the arms start to move to hold the head steady and stop the trunk from tilting back. The back muscles work to keep the back erect and steady.

When you kick a ball the momentum of the leg moving forwards destabilises the trunk and the core stabilisers must work to stop the trunk from tipping backwards.

Core muscles need to respond rapidly in responses to body actions. This is why they need to be specifically trained using activities that elicit rapid and appropriate responses when movements of the limbs destabilise the trunk. Exercises such as sit-ups that bend and extend the trunk in a slow and controlled manner do not improve the ability of the trunk muscles to stabilise the trunk.

#### Examples of exercises for training trunk stability

##### Throwing and catching a ball with the feet

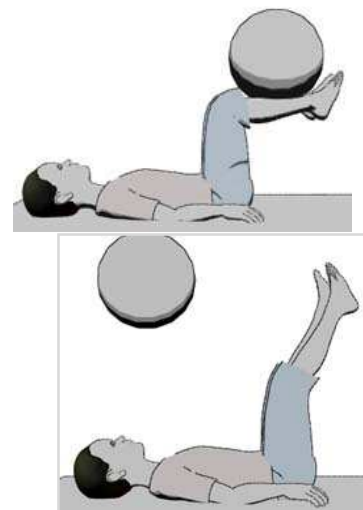
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###### You will need

1. A 45 cm exercise ball
2. A partner

###### Exercise instructions

- Lie on your back on a carpet or an exercise mat. Your partner stands behind your head a few meters away.
- Bend your hips and knees to make a platform to rest the ball on. Rest the ball on your shins.
- Throw the ball up into the air and over your head to your partner.
- Your partner throws the ball back to you.
- Throw the ball 10 times and then take a rest.



###### Note

If the child has difficulty bending the hips and knees to a 90 degree angle, place a small cushion under the hips to tilt the pelvis backwards. This will make it easier to keep the legs in the air.



A pillow under the hips makes it easier to keep the legs up in the air.

# Hand Skills or Action

## Picking up marbles with a peg

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### You will need

1. 10 marbles or other small objects (such as pasta coils or pieces, chickpeas, beads) that can be picked up with a peg
2. A small box lid or bottle lid to hold the marbles. The upright sides of the lid help to stabilise the marble as the child attempts to pick it up.
3. A bowl or bottle to drop the marbles into

### Position and posture

This activity is best done sitting at a table. Encourage the child to sit erect and keep the trunk steady as he or she moves the arms to position the hands.

### Activity

- Put the marbles in the lid.
- Use the peg to pick up the marbles one at a time and drop them in the bowl.

### Notes

1. Notice how many marbles the child is able to pick up before the hand starts to tire. You will know that the hand is starting to tire when he/she starts to find it tricky to pick up the marble, or changes the grip to a finger-to-palm grip or swops hands.
2. Once the child can pick up 12 marbles before getting tired, change to using a peg with more resistance.
3. Marbles are quite tricky to pick up and you need a peg that opens quite wide. Pasta coils or shapes are easier to pick up because they do not roll away as much as a round bead or marble.



## Hand SfA - Activities that require in-hand manipulation

In these activities the child picks up a number of objects and holds them in the palm. He/she then moves them one at a time from the palm to between the thumb and forefinger. This action requires small accurate, and coordinated movements of the thumb and fingers.

### Moving and positioning coins

#### You will need

1. 20 copper coins - about 1.5cm in diameter such as a 1p coin (UK) or 5c coin (South Africa)
2. A sheet of paper with 5 rows of 4 circles 2cm apart

#### Instructions to the child

- Pick up four (4) coins one at a time and hold them in the palm of your hand.
- Now shift one coin to between the thumb and forefinger and then place it carefully on a circle on the paper.
- Repeat this action for each coin in the hand.
- Then pick up the next four coins and move them to the paper in the same way.



#### Notes

1. Placing the beads carefully on a specific spot encourages the child move the coin to between the thumb and forefinger rather than just dropping it from the palm by loosening the grasp of the little finger.
2. You can also build a tower of coins