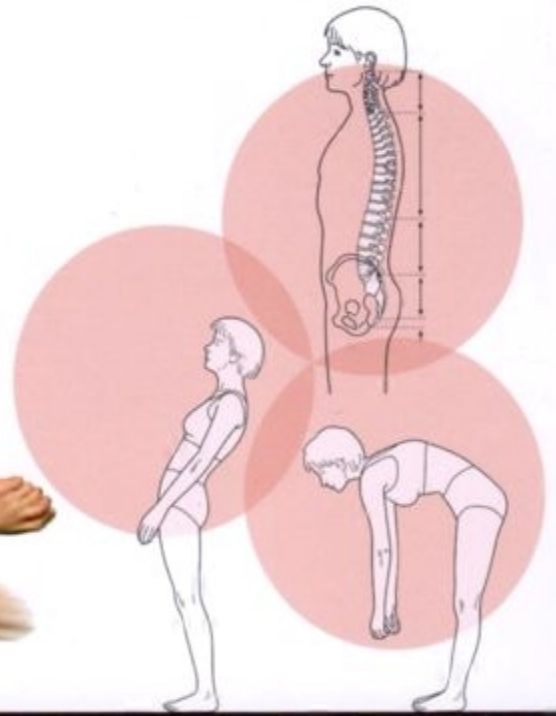
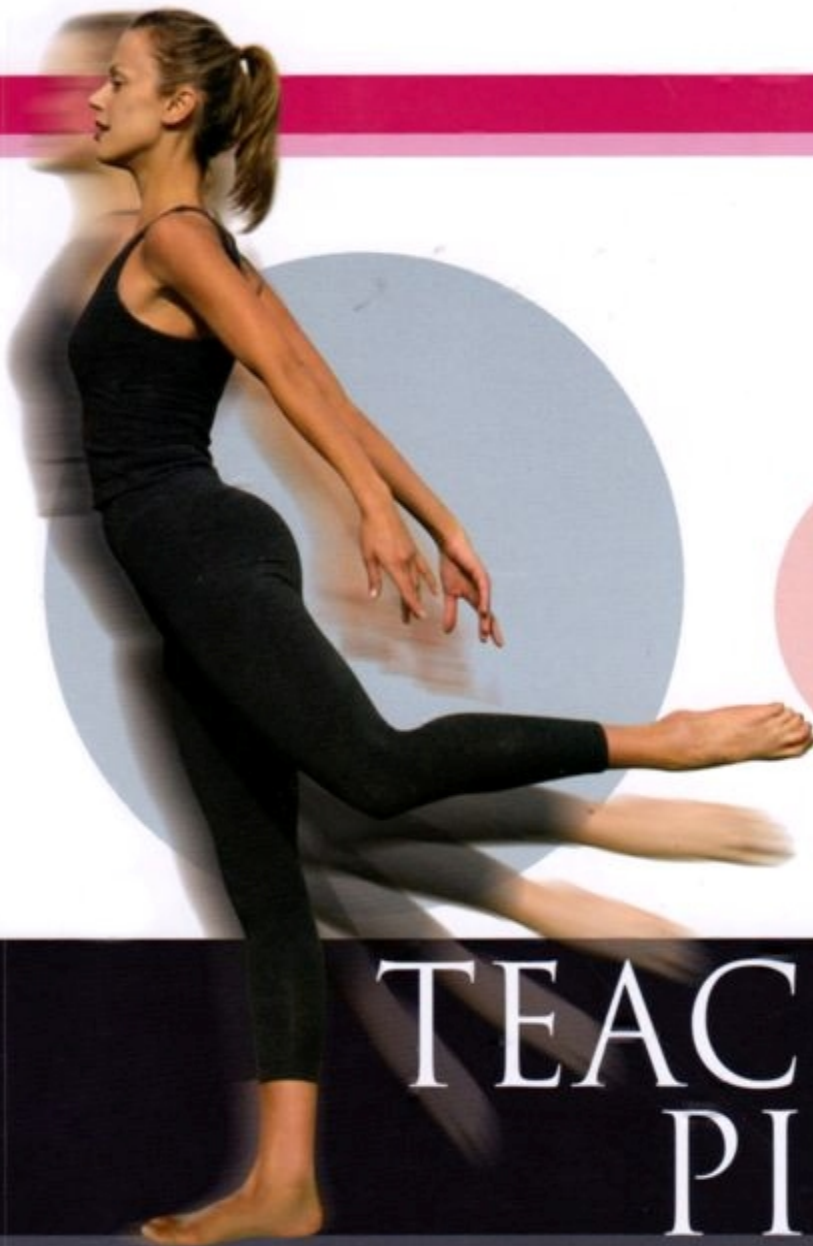


JANE PATERSON



# TEACHING PILATES

FOR POSTURAL FAULTS,  
ILLNESS & INJURY

A PRACTICAL GUIDE

EXEMPLO DE  
CONTEÚDO!



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It is important to realize that bad posture, even when only temporary, as for instance with illness or pregnancy, etc., can lead to a long-term or even permanent loss of previously good posture with associated physical and sometimes psychological problems.

## GOOD ERECT POSTURE



**Figure 1.1** Good erect posture. Reproduced with permission from Sahrman (2002).

Good erect posture (Fig. 1.1) requires an understanding of the vertebral column's structure and function as well as the basic principles of maintaining an upright stance. It also demands the ability to observe and assess posture so as to recognize common postural habits, faults and movement patterns.

These are discussed under the following headings:

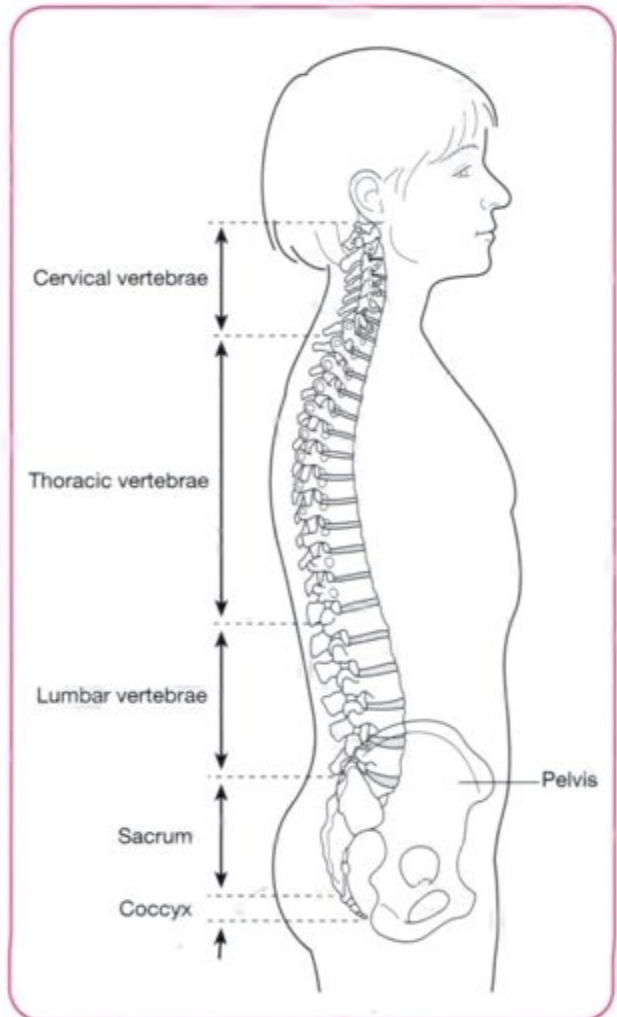
- Basic principles of maintaining an upright stance:
  - Spinal anatomical structures
  - Body mass and centre of gravity
  - Base of support
  - Line of gravity
  - Centre of pressure
  - Balance and stability.

- Postural observational skills and assessment:
  - Body types
  - Assessment procedures
  - Ideal alignment
  - Easily recognized faulty postures
  - Common faults in foot placement and leg alignment.

## BASIC PRINCIPLES OF MAINTAINING AND UPRIGHT STANCE

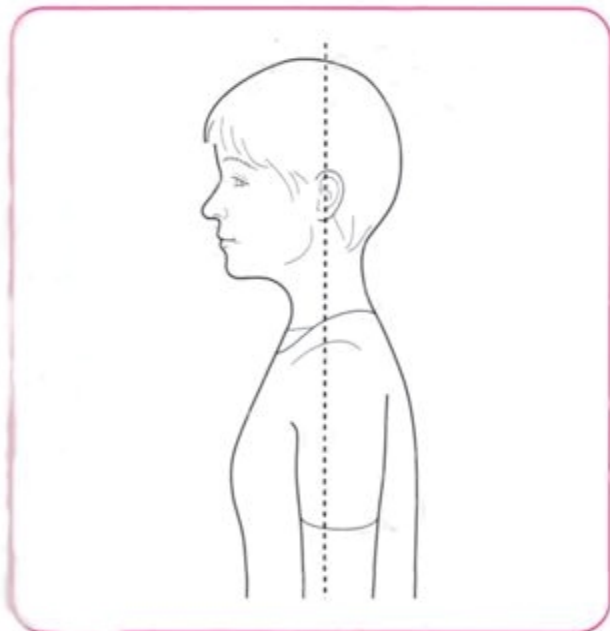
### Spinal anatomical structures

'The back' or 'the spine' comprises the vertebral column and associated ligaments and muscles, together with the intervertebral discs and the contents of the vertebral canal (Figs 1.2 & 1.3).



**Figure 1.2** Side view of spine.





**Figure 4.1** Ideal neck posture. Redrawn with permission from Oliver (1999).



**Figure 4.2** Correct head and neck position in supine.

nowel) to achieve correct resting alignment. These may need adjusting as exercises progress – for example, head supports can restrict spine movement when progressing from small pelvic tilts to full pelvic curls. The use of head supports for an individual should be continuously reviewed as spine mobility and overall posture improve.

### PECTORAL GIRDLE AND SCAPULAR ALIGNMENT IN STANDING AND SITTING

#### Viewed from side

- The normal thoracic curve is intact so that the ribcage is balanced over the pelvis and lower limbs (Fig. 4.3).
- The line of gravity falls in front of the glenohumeral joint approximately through the centre of the acromion process.
- The glenohumeral joint is neutral in rotation, the proximal and distal ends of the humerus aligned in



**Figure 4.3** Correct pectoral girdle alignment in sitting.

the same vertical plane with the palms of the hands facing the body and the thumbs facing forwards.

#### Viewed from front

- The ribcage should be centred over the pelvis and lower limbs with the shoulders facing directly forwards.

#### Viewed from back

- The scapulae lie flat against the ribcage between the second and seventh thoracic vertebrae with their vertebral borders parallel to and approximately 7.5 cm from the midline of the spine.
- They are rotated approximately 30 degrees anterior to the frontal plane to follow the curve of the ribcage (Sahrmann 2002).

### NEUTRAL SPINE IN STANDING, SITTING AND SUPINE

The pelvis is in neutral and the normal spinal curves are intact but not exaggerated (Figs 4.4 & 4.5).

#### Neutral spine in standing

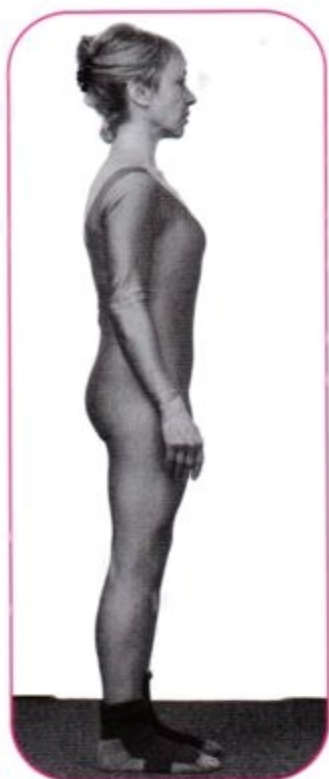
##### Viewed from side

- The cervical, thoracic and lumbar curves are intact.

#### Neutral spine in sitting

##### Viewed from side

- The cervical and thoracic curves are intact but the lumbar curve appears slightly less than in standing.
- The body weight balances over the ischial tuberosities.



**Figure 4.4** Neutral pelvis in standing.

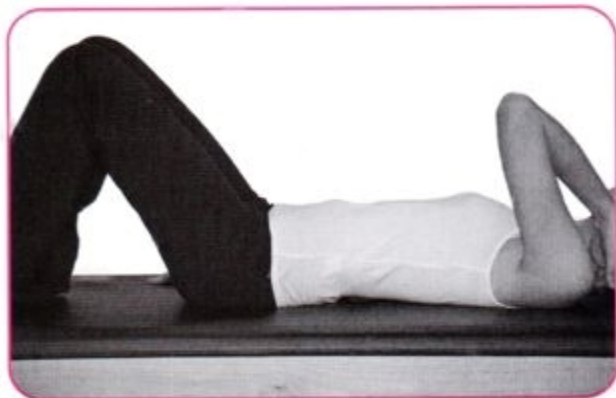


**Figure 4.5** Neutral pelvis in sitting.

### Neutral spine in supine

#### Viewed from side

- The normal cervical and thoracic curves are apparent but the lumbar spinal curve may appear less than when viewed in standing (Fig. 4.6).



**Figure 4.6**

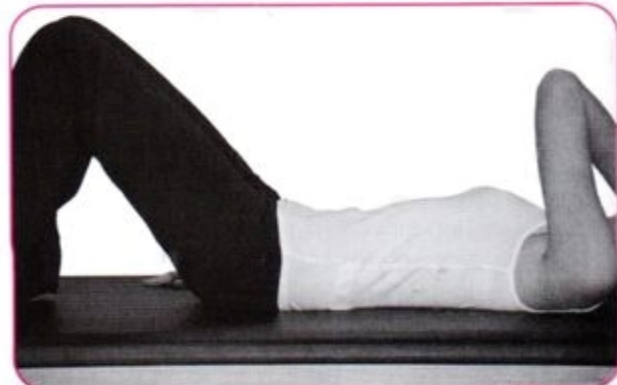
- The spine's true alignment may be obscured by the effects of gravity on soft structures surrounding the lumbar spine and pelvis.

### NEUTRAL PELVIS

When the body is supine the pelvis lies in the transverse plane. Using the anterior superior iliac spine (ASIS) and pubis as landmarks, a triangle traced with the fingers between these points lies parallel with the floor.

### IMPRINTED SPINE (RELAXED BACK POSITION)

When the body is supine the pelvis is positioned with a posterior tilt to eliminate the normal lumbar curve. Using the ASIS and pubis as landmarks, the pubis is positioned at a higher level than the ASIS (Fig. 4.7).



**Figure 4.7**

### SUPINE POSITION: NEUTRAL LUMBAR SPINE AND PELVIS

#### Body position

Lying on the back with the hips and knees flexed approximately 90 degrees and the hips neutral in rotation. The heels are aligned with the axes of the hip joints. The normal spinal curves are intact (Fig. 4.8).

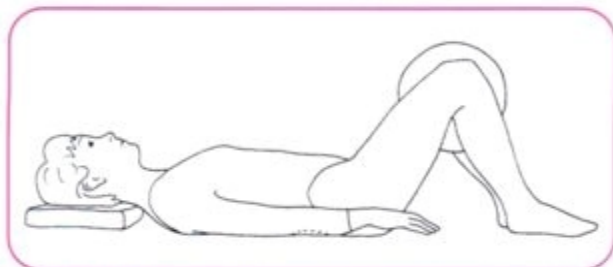


**Target muscles**

Transversus abdominis.

**Body position**

Semi-supine – neutral pelvis (Fig. 4.16).

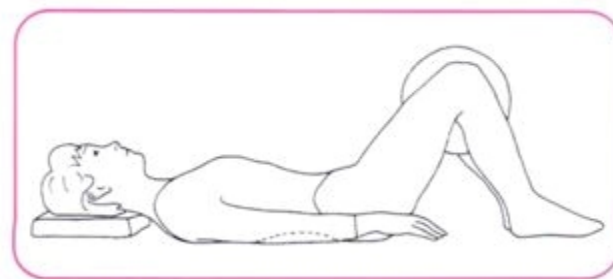


**Figure 4.16** Breathing in.

**Action**

*Breathing in* – relax the abdominal muscles and fill the back and sides of the ribcage with air.

*Breathing out* – allow the back and chest muscles to relax and draw the abdomen just above the pubic bone (below the navel and approximately the lower third of the anterior abdominal wall) up and in towards the spine – this hollows just the lower abdominal area (Fig. 4.17).



**Figure 4.17** Breathing out.

Hold for 10 seconds.

Release slowly and relax completely at the end of the motion.

Repeat the sequence up to 10 times.

**Modification 1**

During *breathing in*, begin tightening the pelvic floor muscles. Then to assist transversus abdominis activation, lift the pelvic floor without tensing the rest of the body during *breathing out*.

**Modification 2**

Perform with a slight posterior pelvic tilt (the lumbar spine is flattened and the lower back muscles are relaxed).

**Modification 3**

Perform in four-point kneeling. Initiate the action with a pelvic floor muscle contraction and the teacher may lightly palpate multifidus to assist transversus abdominis muscle engagement.

**Common problems**

- Breathing and abdominal work not coordinated: Allow the student to find their own breathing rhythm.
- Core stability insufficient: Raise the feet onto a box or half barrel, or, if appropriate, lying supine on a roller assists firing the pelvic floor and lower abdominal muscles.
- Student unable to activate transversus abdominis without other muscle recruitment (indicated by spine or ribcage movement or lateral flaring/tightening of the waist): Attempt the exercise in different body positions – for example, side lying with the upper body slightly rounded, supported prone position, lying over a gym ball, quadruped position to help fire transversus abdominis muscle action; cue to initiate the motion with a pelvic floor muscle contraction and lightly palpate multifidus.

See Table 4.9 for Teaching points.

**!** **Precautions**

- Individuals complaining of ongoing lower back, pelvic or abdominal pain should be referred for a physiotherapy or medical assessment.

**+** **Contraindications**

- Recent abdominal or pelvic surgery – seek medical advice.

**Tactile cue suggestions**

1. To increase breadth across the front of the chest – use the hands to stroke the collarbones from the sternum to their lateral aspects.
2. To establish the correct relationship between the upper and lower torso – on exhaling, use the hands on the lower ribs to assist funnelling them down towards the pelvis.
3. To assist transversus abdominis engagement – before exercising, instruct the student to place two fingers of each hand on the top of the hip and trace a line towards the centre of body until the fingers are still approximately 10 cm apart. Then instruct to press slightly inwards

**Table 4.22** Teaching points – Floating arm and leg series

Focus on	Examples of verbal/visual cues
Efficient abdominal control and core stability throughout	Draw the pelvic floor muscles upwards and the navel back towards the spine
Shoulder alignment and girdle stability	Imagine the shoulder blades sliding down across the back
Achieving independent glenohumeral joint movement	Lengthen the spine as the hand floats away from the floor Imagine the little finger slowly moving through water as the hand floats upwards
Achieving spine elongation throughout	Visualize light or space between the vertebrae
Achieving independent hip joint movement	Release and lengthen through the front of the hip to reach the leg away Imagine the leg floating up as if being lifted by a hot air balloon

### Tactile cue suggestions

1. To promote spine elongation – lightly place one hand on the lower back and run the other hand up the spine to rest on the crown of the head.
2. To promote spine/pelvic stabilization – rest a stick along the spine throughout the motion.
3. To correct pectoral girdle alignment and stability – use the hands to direct the shoulder blades down and across the back.
4. To correct the relationship between the upper and lower torso – use the hands to funnel the ribs down towards the pelvis during spine extension.
5. To correct dynamic alignment – lightly touch the back of the hand or the heel.
6. To promote lengthening the leg out of the hip joint – lightly touch the heel of the active leg.
7. To maintain the superficial neck muscles comparatively relaxed – gently place the thumb and third finger of the left hand just below the occipital tuberosities to direct the head forwards and correct cervical spine alignment. The right hand can assist in supporting and directing the forehead as required.

### Exercise BCS19 – Cat (spine mobilization)

#### Aim

- To promote spine elongation and segmental mobilization.
- To improve vertebral column mobility in flexion/extension.
- To improve abdominal muscle control over spine mobilization.
- To improve pectoral girdle orientation and stability during weight bearing with the upper extremities.

#### Equipment

Mat or firm bed, foam roller.

#### Target muscles

*For lumbar spine stability* – the pelvic floor and transversus abdominis.

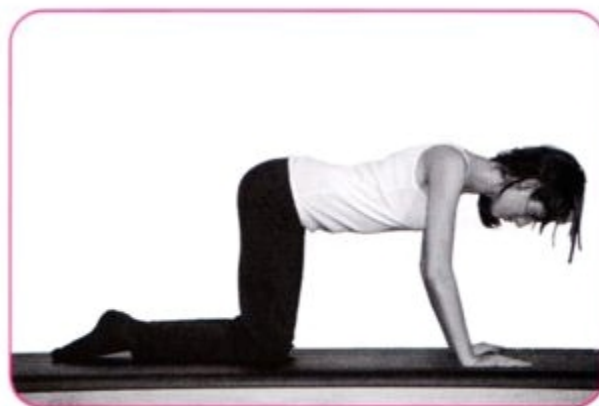
*For pectoral girdle stability* – gentle activation of the middle and lower fibres of trapezius, latissimus dorsi and teres major.

*For spine mobilization in flexion* – rectus abdominis and the oblique abdominals.

*For spine mobilization in extension* – erector spinae.

#### Body position

Four-point kneeling (Fig. 4.52A).



**Figure 4.52A**

#### Action

*Breathing in* – to prepare.

*Breathing out* – press the little fingers into the floor to increase scapulae stability as the pelvic floor and lower abdominal muscles engage.

*Breathing in* – maintain abdominal muscle activation and begin by flexing the lumbar spine, directing the ischial tuberosities towards the backs of the knees (Fig. 4.52B).



Lift the fingers of the left hand away from the toes and use pressure through the heel of the left hand to plantarextend the forefoot. Hold for 10 seconds. Repeat three times in both directions with each foot.

### Action 3

Use the left hand to gently mobilize each toe of the right foot through flexion, extension, abduction and adduction. Repeat on the other side.

For increased mobility through resisted stretching, apply opposing pressure with the fingers or through the use of rubber bands as the toes actively flex or extend. Hold the resistance for 10–15 seconds. Release and use the hand to passively mobilize the joints involved.

## Exercise FM1.2 – Exercising the forefoot (instep lifts)

### Aim/Target muscles

- To exercise the intrinsic foot muscles.
- To improve foot mobility.
- To strengthen the foot's supporting arches.
- To improve lower limb alignment.

### Equipment

Chair or low bed.

### Body position

Sitting on a chair with the backs of the thighs supported and both feet flat on the floor (Fig. 6.17A).



Figure 6.17A Relaxed position.

### Action

Keeping the heel and toes in contact with the floor, lift the instep. Aim to keep the toes lengthened and comparatively relaxed as the lumbrical muscles engage. Their muscular action is felt under the foot and above between the metatarsal bones, and can be observed as the spaces between them narrow.

Perform slowly, checking to see that the instep lifts evenly and correct alignment is maintained (Figs 6.17B&C).



Figure 6.17B Engaging the lumbrical muscles.



Figure 6.17C Lifting the instep.

## Exercise FM1.3 – Exercising the forefoot (instep lifts with toe action)

### Aim/Target muscles

- To exercise the intrinsic foot muscles.
- To improve foot mobility.
- To strengthen the foot's supporting arches.
- To improve lower limb alignment.

### Equipment

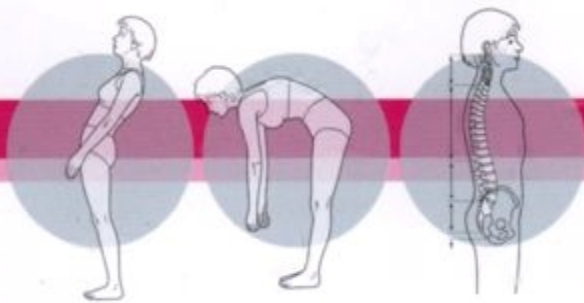
Chair or low bed, a tissue or light cloth.

### Body position 1

Sitting on a chair with the backs of the thighs supported and both feet flat on the floor.

### Body position 2

Lying supine with the hips and knees flexed approximately 60–90 degrees and the feet resting on a wall.



## TEACHING PILATES FOR POSTURAL FAULTS, ILLNESS & INJURY

### A PRACTICAL GUIDE

The pilates technique is very much used in physiotherapy treatment, especially in remedial exercises to aid recovery and rehabilitation after surgery, as well as with back problems and sports injuries. *Teaching Pilates for Postural Faults, Illness and Injury* will also be invaluable for health professionals and trained and trainee teachers of pilates.

Pilates is a safe and effective exercise system designed to strengthen the body in a balanced way by specifically targeting and improving the function of weaker muscle groups. It emphasizes techniques for strengthening the muscles of the trunk to support the spine and thereby improve posture and shape. Exercises enhance overall flexibility, strength, and fitness, improving coordination and balance, and muscles are gently stretched and lengthened as the exercises progress.



#### Features:

- describes the underlying principles of the exercises in physical terms
- describes the treatment of common medical conditions
- supported by over 300 high quality illustrations
- provides a manual for those in the remedial health care professions, especially within physiotherapy and manual therapy

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