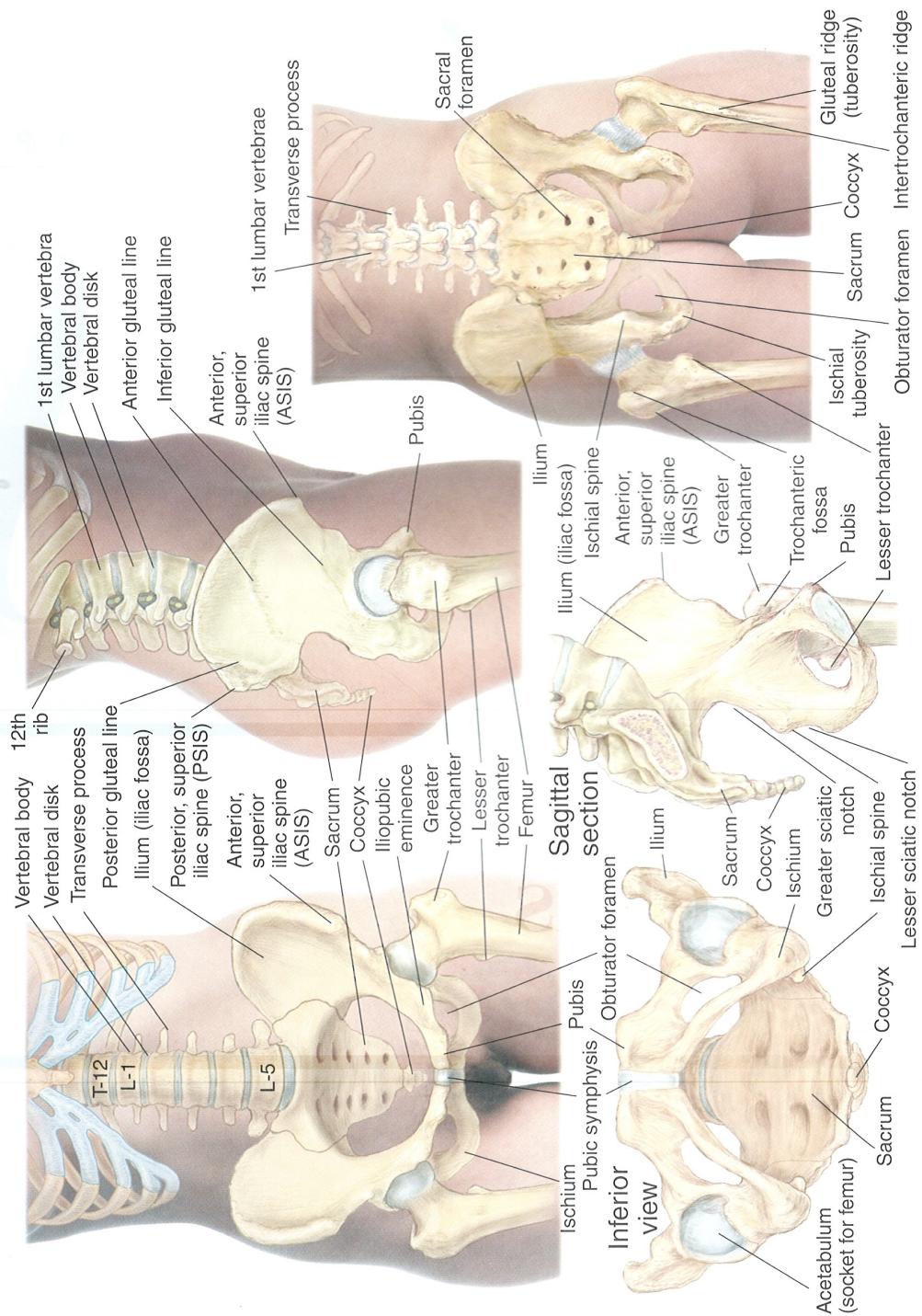


## CHAPTER



# The Pelvis



**Plate 8-1** Skeletal features of the pelvic region

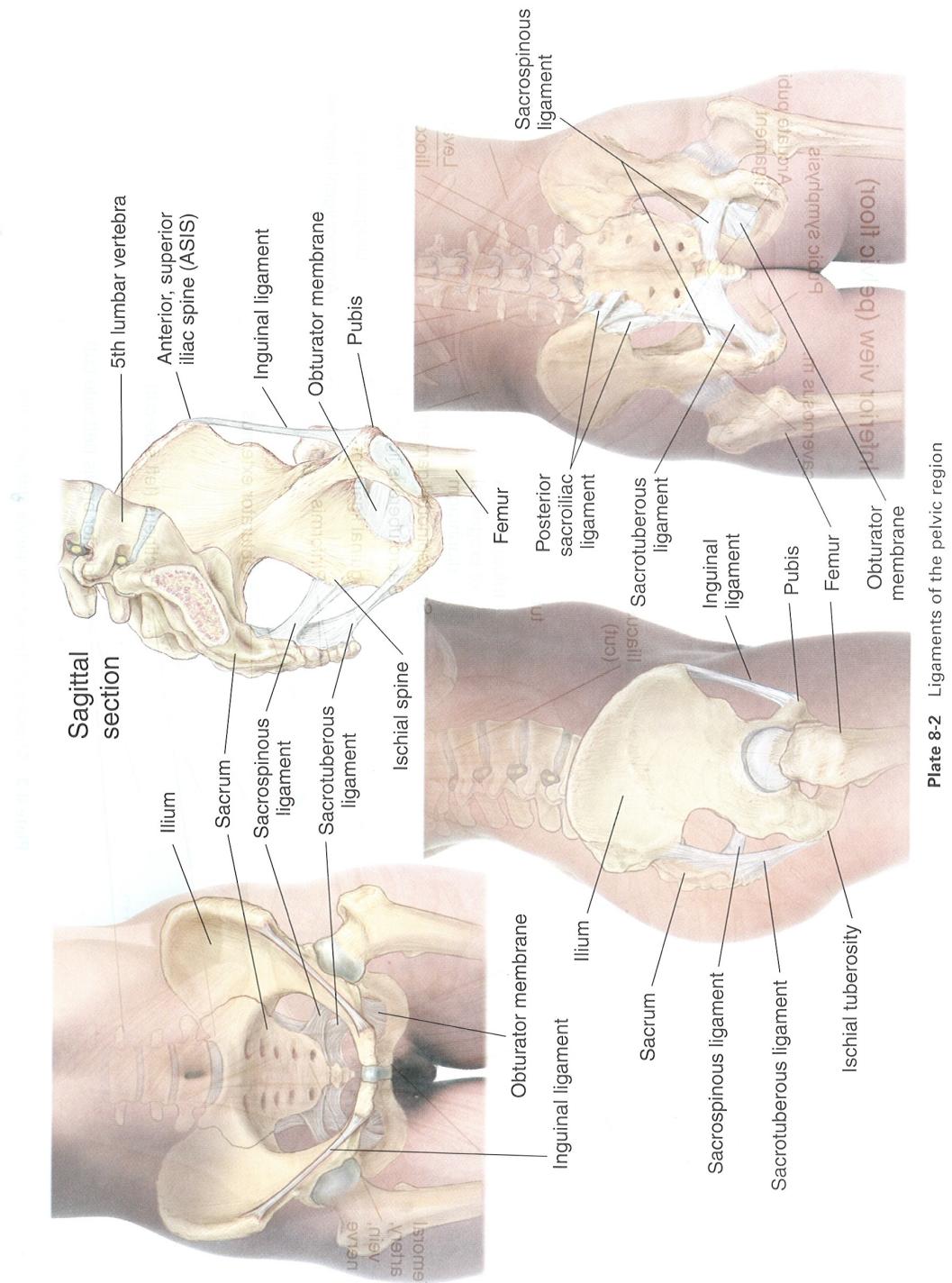
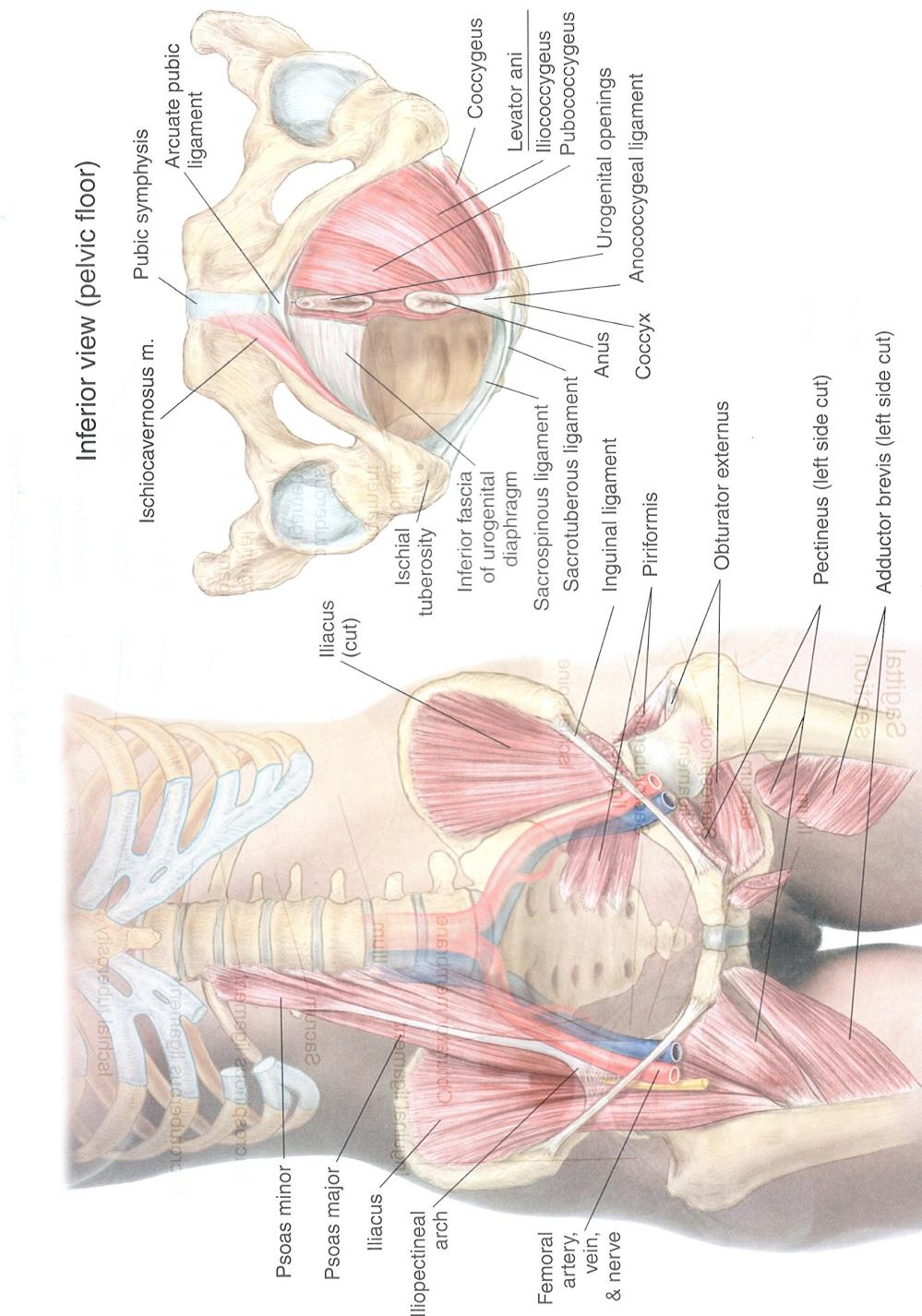


Plate 8-2 Ligaments of the pelvic region



**Plate 8-3** Muscles of the anterior pelvis and pelvic floor

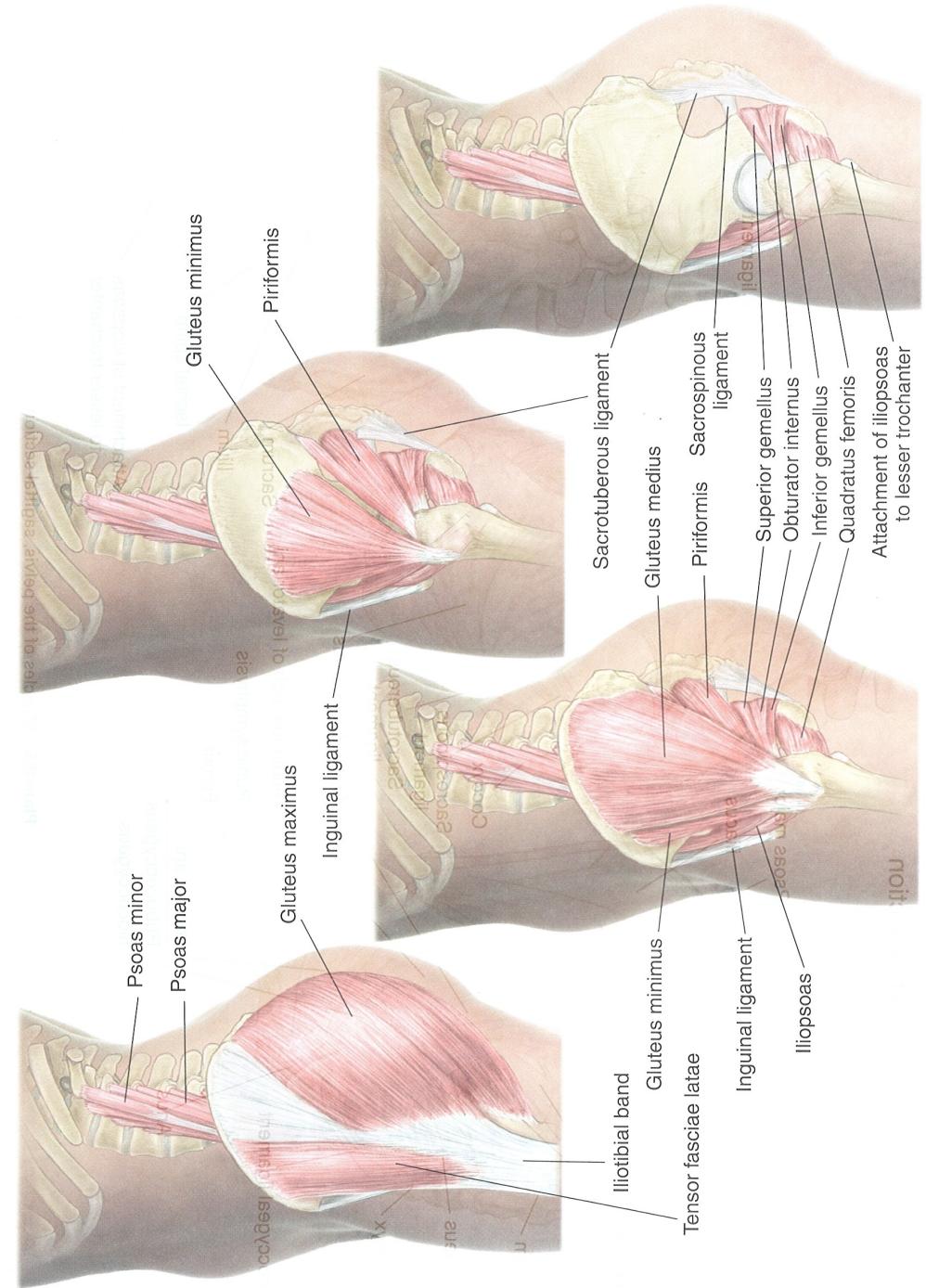


Plate 8-4 Muscles of the pelvis, lateral view

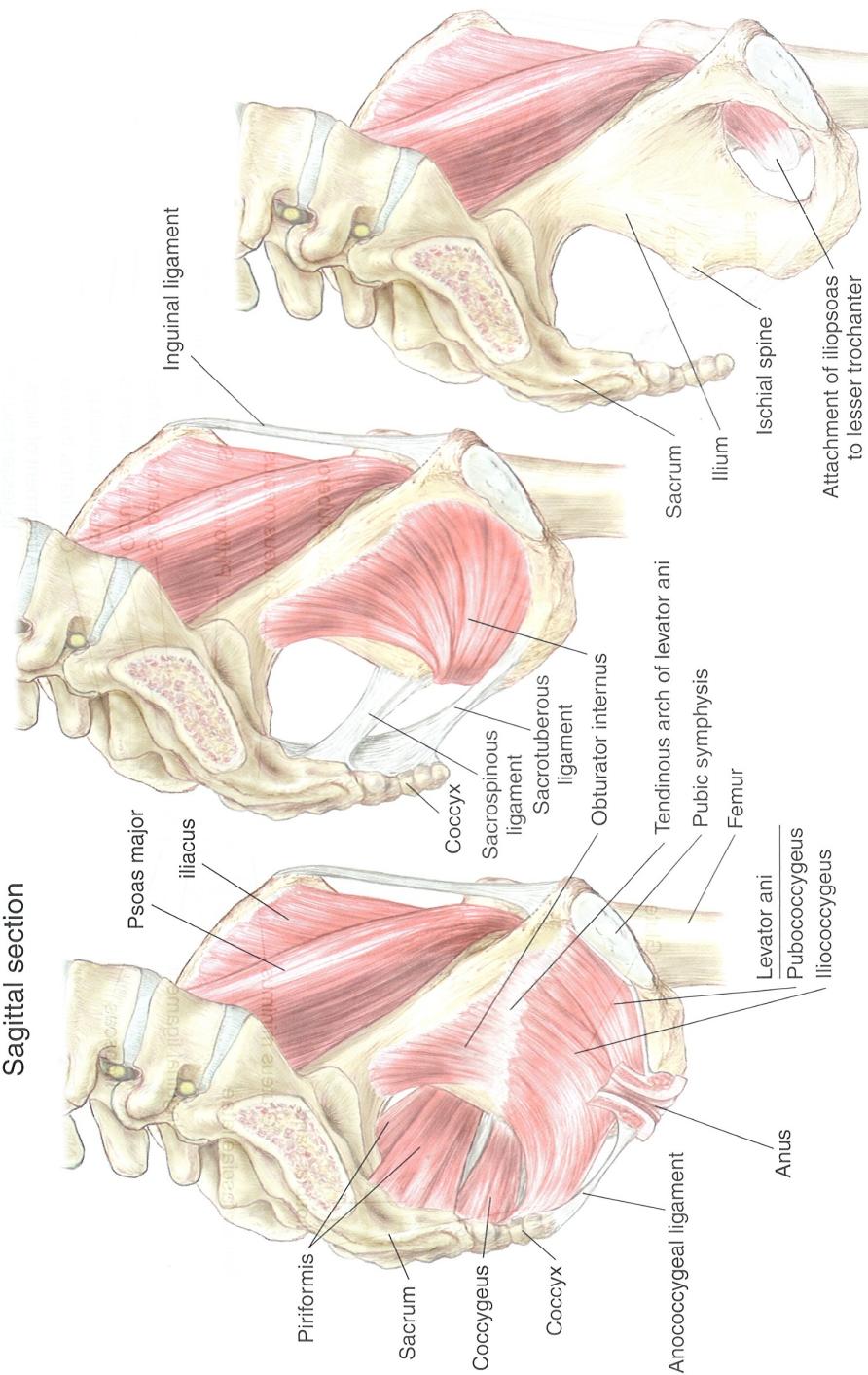


Plate 8-5 Muscles of the pelvis, sagittal section

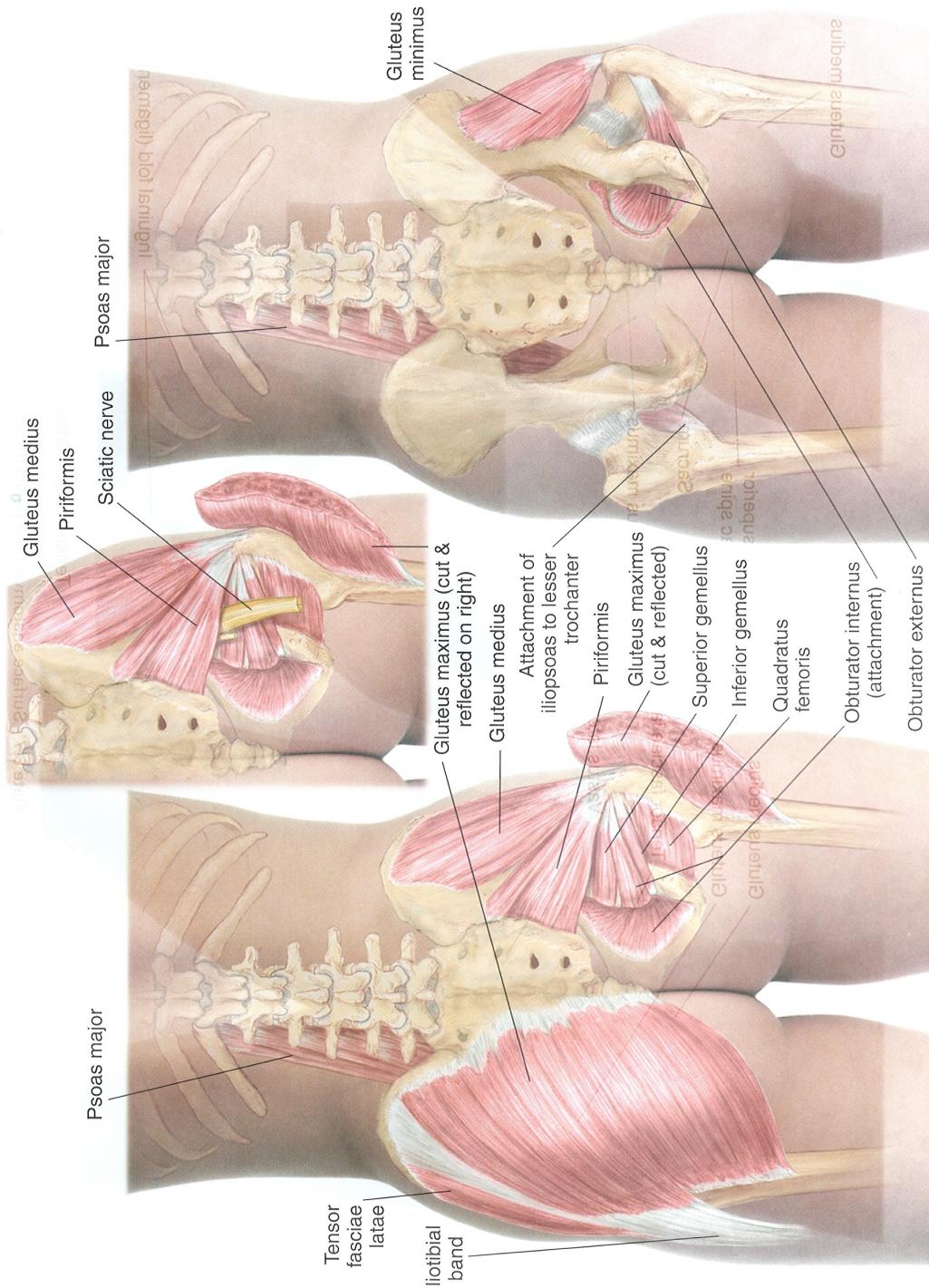


Plate 8-6 Muscles of the pelvis, posterior view

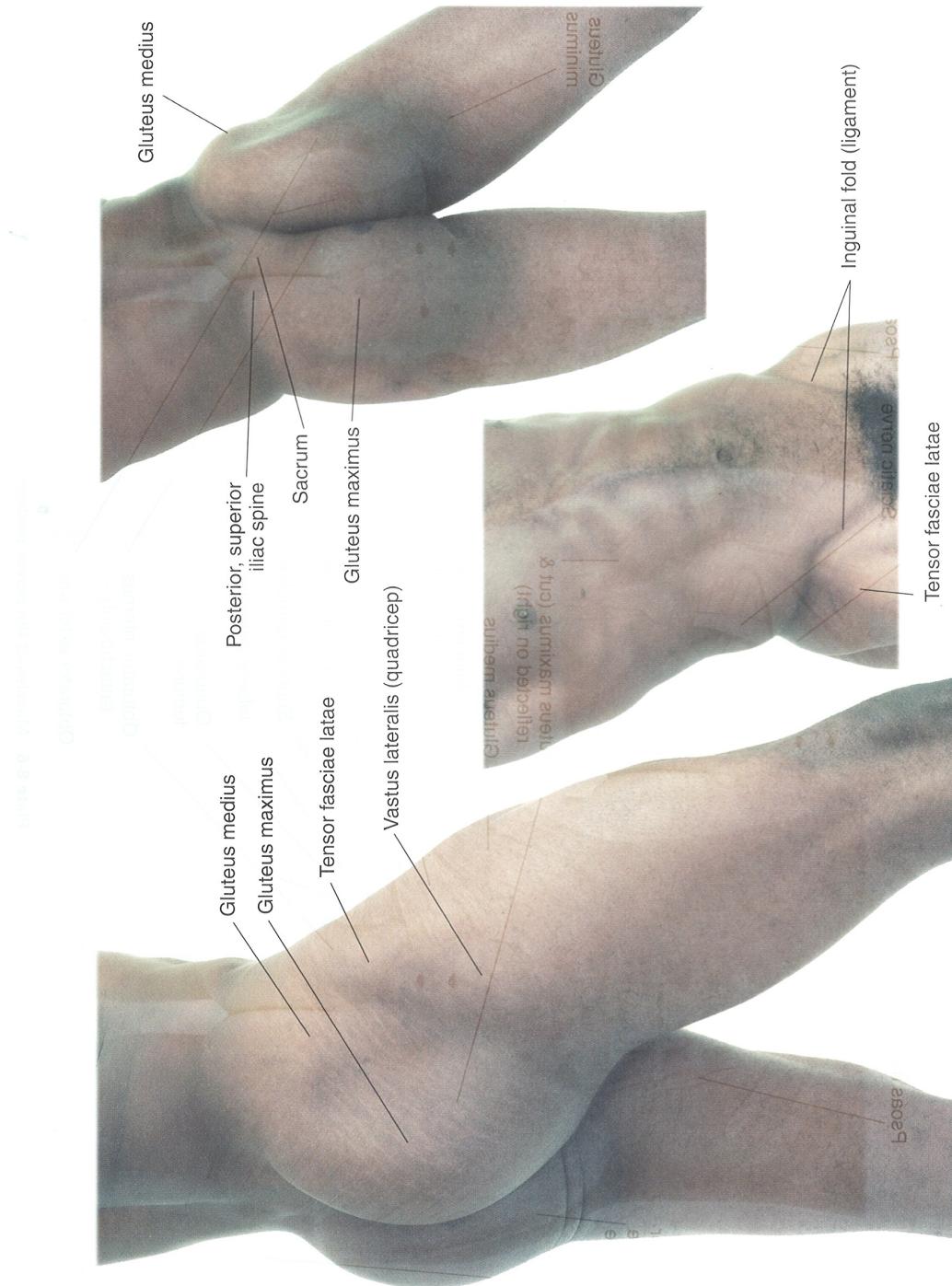


Plate 8-7 Surface anatomy of the pelvic region



## OVERVIEW OF THE REGION

The structural, functional, and emotional importance of the human pelvis cannot be overemphasized. The pelvis balances the torso and its appendages on the legs. It is the container, support, and protector of the abdominal and pelvic organs, especially the organs of reproduction and elimination. It is therefore a very personal and intimate area. Its position and freedom of movement are of principal importance in postural alignment.

Although we tend to think of the pelvis as a single entity, it is actually composed of two halves, or hemipelves, connected posteriorly at the sacroiliac joints and anteriorly at the symphysis pubis. The pelvis as a whole can be rotated forward or backward, or tilted to either side. Each hemipelvis, however, can have a greater or lesser anterior or posterior rotation in relation to the other, resulting in what is called a torqued pelvis. Since each hemipelvis is the site of one acetabulum, in which the head of the femur rests, the position of the hemipelvis will affect the position of the hip joint and its corresponding leg. The anterior or posterior rotation of the pelvis as a whole will also affect the normal curve of the lumbar spine, which

in turn will affect the carriage of the entire upper body.

A lateral tilt in the pelvis, determined by the relative positions of the two sacroiliac joints, will result in an uneven distribution of the body weight on the legs, and will require a compensatory shifting of the rib cage and its attached structures. Any combination of tilt or rotation in the frontal or sagittal planes and torque of the hemipelves will result in a postural misalignment that is likely to cause a wide variety of myofascial problems in both the lower extremities and the entire upper body. In addition to postural issues, tightness or trigger points in the muscles of the pelvis can interfere with reproductive or eliminatory functions and can refer pain into the viscera.

The muscles of the pelvis should always be considered and addressed in any interview and examination. Because of the intimate nature of the pelvic region, it is necessary to approach examination and treatment with a great deal of sensitivity to the client's feelings and concerns with regard to privacy and modesty and should be carried out only with informed consent.



Figure 8-1 The human skeleton. (From Porth CM: Essentials of pathophysiology: concepts of Alimentary and Respiratory Health, 2nd ed. Philadelphia, Lippincott, Raven, 1998.)

## Psoas Major (Iliopsoas) (Fig. 8-1)

**SO-az MAY-jer**

**Etymology** Greek *psoa*, the muscles of the loins + Latin *major*, larger

### Overview

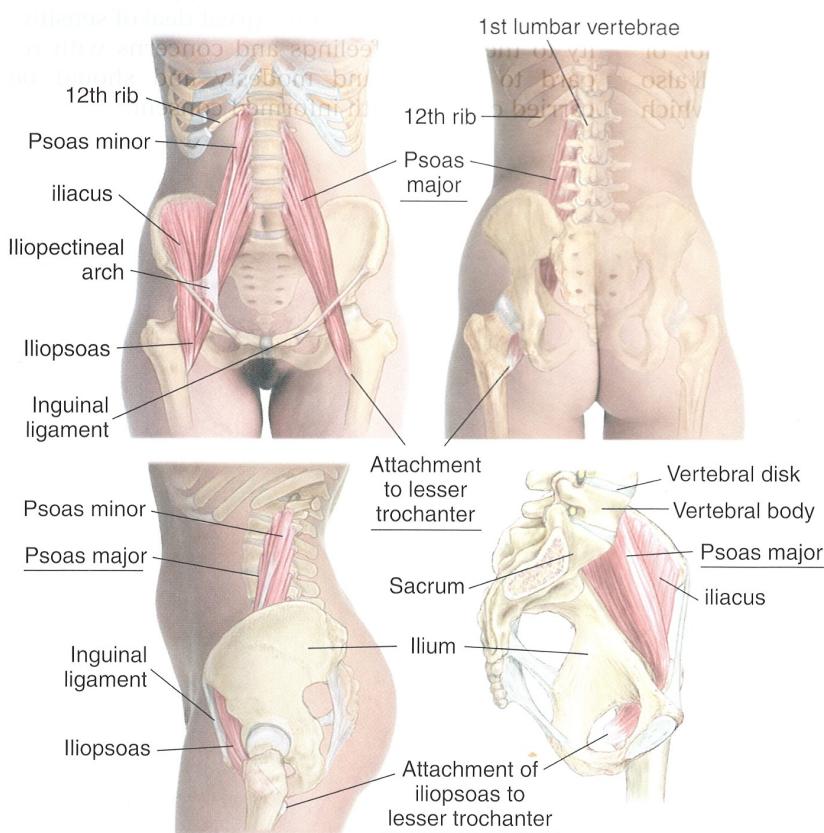
**Psoas major**, which joins **iliacus** at the groin to form **iliopsoas**, is one of the most important muscles in the body, not only for its primary function as hip flexor, but also for its postural and clinical significance.

In four-legged domestic animals, iliopsoas has little challenging work to do, since it has no real postural function and acts only to swing the hind leg forward in walking. For this reason, it tends to be a tender cut of meat: it is the tenderloin or filet, the source of the filet mignon. In humans, the

story is altogether different: since we walk upright, much greater muscular effort is required to flex the hip and lift the leg. In addition, psoas plays a major role in determining the positioning of the pelvis and low back in relation to each other.

During gestation, the hips of the fetus remain fully flexed most of the time. If you observe human babies, you will notice that they do not lie flat—the hips tend to stay partially flexed. In fact, a baby does not usually attain full extension of the hips until she begins to walk. This full extension is necessary for a relaxed and comfortable upright posture. Children spend a great deal of time sitting, either in class at school, or at home studying or watching television. Most adults spend even more time in this position at desks or computers or, again, in front of the television. Iliopsoas, therefore, spends a lot of time shortened and very little time stretched.

Psoas attaches to the lumbar vertebrae and passes downward through the abdominal cavity to



Sagittal section

**Figure 8-1** Anatomy of psoas major

the groin, where it merges with iliacus and passes over the anterior rim of the ilium, then obliquely in a posterior and inferior direction to attach to the **lesser trochanter** of the femur. In this way, it uses the anterior rim of the ilium as a pulley, exerting an inferior and posterior force against it. Thus, by pulling forward on the lumbar spine and pressing downward and backward on the anterior inferior ilium, it rotates the pelvis forward and draws the lumbar curve into lordosis (Fig. 8-2). This effect can easily be seen in children, who tend to have this rotation and lordosis to a pronounced degree, and it is quite common for this postural tendency to persist into adulthood to a lesser, but still measurable, extent. One result of an anterior pelvic rotation is to shift the weight of the contents of the abdominal cavity forward, causing the abdomen to protrude. In addition, this rotation moves the hip joint posteriorly, placing strain on the muscles controlling the knees and ankles. An exaggerated lumbar lordosis requires compensatory positioning of all the structures superior to it.

The clinical significance of psoas is both indirect and direct: indirect, in the postural influences described above, and direct, by referring pain into the low back, abdomen, groin, and upper thigh. The pain referral patterns of psoas can include the viscera. In this way, psoas problems can mimic pain from visceral causes.



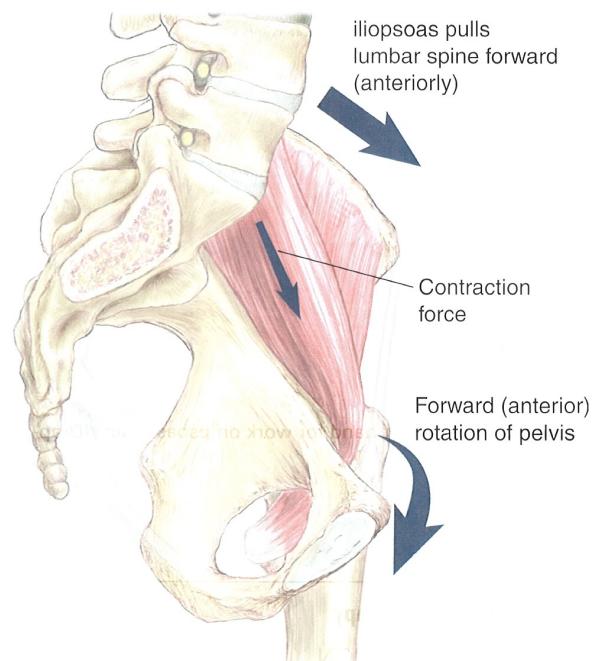
### Attachments

- Superiorly, to the vertebral bodies and intervertebral disks of the twelfth thoracic to the fifth lumbar, and to the transverse processes of the lumbar vertebrae
- Inferiorly, with the iliacus muscle to the lesser trochanter of the femur



### Action

- Flexes the hip; is a major postural muscle



**Figure 8-2** Influence of psoas major on anterior pelvic rotation



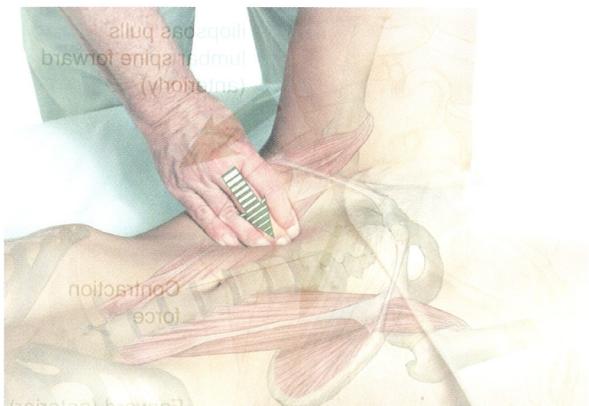
### Referral Area

- To the medial lumbar region
- To the abdomen from the epigastrium to the groin
- To the anterior thigh from the groin halfway to the knee



### Other Muscles to Examine

- Iliacus
- Rectus abdominis
- Abdominal obliques
- Diaphragm
- Hip adductors
- Quadratus lumborum
- Lumbar erector spinae muscles



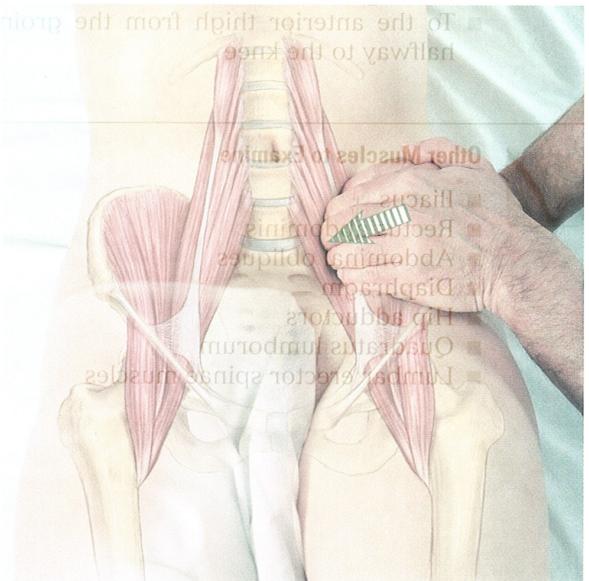
**Figure 8-3** Position of hand for work on psoas major (Draping option 5)



### Manual Therapy

#### COMPRESSION

- The client lies supine, with the hip and knee on the side to be treated flexed about 45°.
- The therapist stands beside the client, at the client's hip.



**Figure 8-4** Compression of psoas major (Draping option 5)



**Figure 8-5** Compression of iliopsoas below the inguinal ligament (Draping option 5)

- Place the fingertips of the hand nearest the client on the near side of the abdomen, a few inches inferior and lateral to the navel (Fig. 8-3).
- Press firmly and slowly into the abdomen, moving the fingertips in a circular fashion to nudge the viscera out of the way.
- When you encounter the psoas, press into the muscle searching for tender areas (Fig. 8-4). Hold for release.
- Move the hand caudally so that the fingertips are just inferior to the previous spot.
- Repeat this procedure until you reach the inguinal ligament.
- Repeat at the groin below the inguinal ligament (the circular motion is not necessary here) (Fig. 8-5).
- This work on psoas may also be done from the opposite side of the client (Fig. 8-6), with the client in a sitting position (Fig. 8-7), or standing bent over the table (Fig. 8-8).



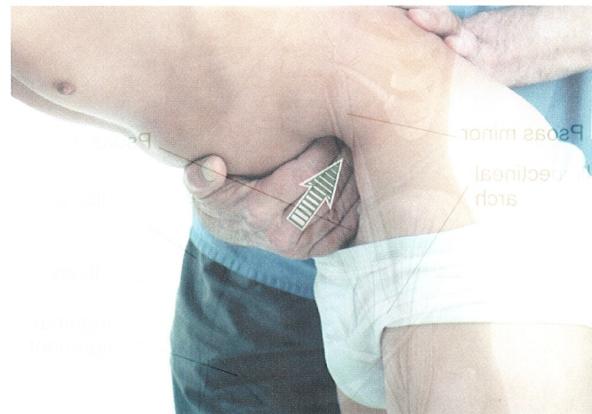
**Figure 8-6** Compression of psoas major from opposite side of client (Draping option 5)

#### COMPRESSION OF THE INFERIOR ATTACHMENT

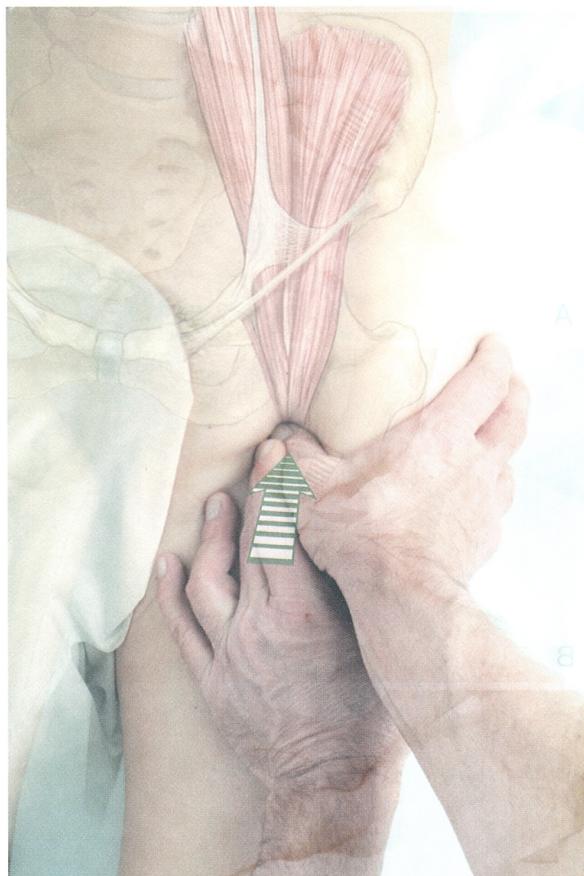
- The client lies supine.
- The therapist stands beside the client at the client's knees.
- Place the supported thumb on the anterior thigh, about two inches below the groin, medial to the rectus femoris.
- Press firmly into the tissue, looking for the attachment to the lesser trochanter (Fig. 8-9). If tender, hold for release.



**Figure 8-7** Compression of psoas major with client in sitting position (Draping: underwear, swimsuit, or exam gown)



**Figure 8-8** Compression of psoas major with client standing bent forward (Draping: underwear or swimsuit)



**Figure 8-9** Compression of attachment of psoas major to lesser trochanter (Draping option 5)

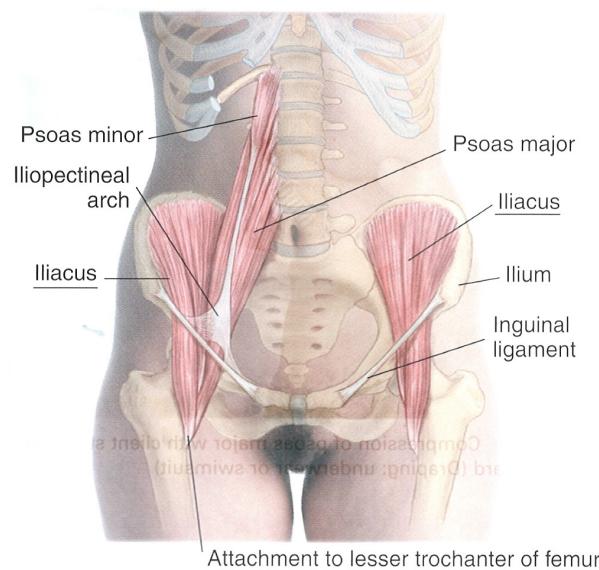


Figure 8-10 Anatomy of iliacus

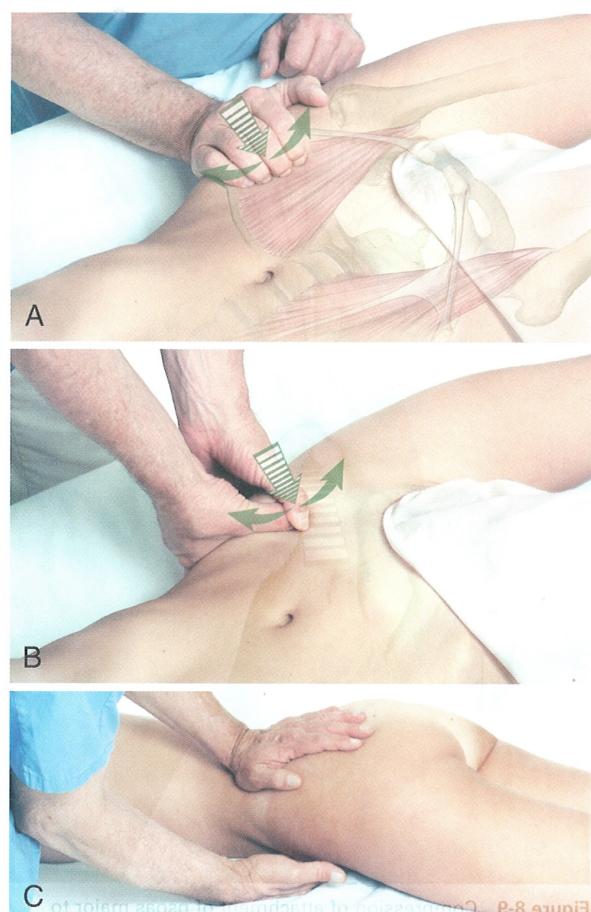


Figure 8-11 Stripping and cross-fiber stroking of iliacus with fingertips (A), supported thumb (B), and from underneath the client (C) (Draping options 7, 2)

## Iliacus (Fig. 8-10)

**il-lee-ACK-us, il-EYE-a-cus**

**Etymology** Relating to the ilium: Latin *ilium*, flank, groin

### Overview

See discussion of psoas, above.

#### Attachments

- Superiorly, to the iliac fossa
- Inferiorly, to the tendon of psoas, the anterior surface of lesser trochanter, and the capsule of the hip joint

#### Action

Flexes the hip

#### Referral Area

See psoas, above.

#### Other Muscles to Examine

See psoas, above.

#### Manual Therapy

##### STRIPPING AND CROSS-FIBER STROKING

- The client lies supine.
- The therapist stands beside the client at the hip.
- Place the fingertips just medial to the ilium.
- Pressing firmly into the tissue, move the fingertips back and forth and rotate the hand from side to side to slide the fingertips across the muscle (Fig. 8-11A).
- This procedure may also be carried out with the supported thumb (8-11B), or with the client prone and the hand underneath the pelvis (Fig. 8-11C).

## Psoas Minor (Fig. 8-12)

**SO-az MY-ner**

### Etymology

Greek *psoa*, the muscles of the loins + Latin *minor*, smaller

### Overview

Psoas minor is absent in approximately 40% of the population, and in some people may be present on one side only. It has no recorded clinical significance.

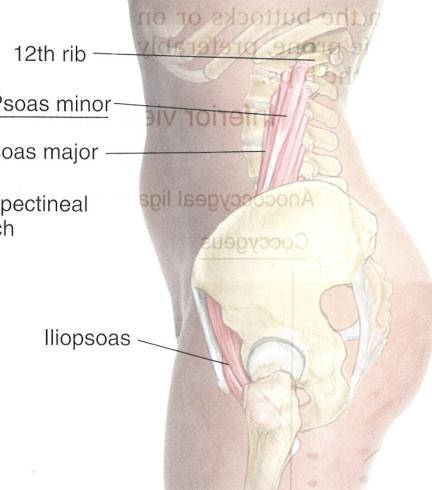
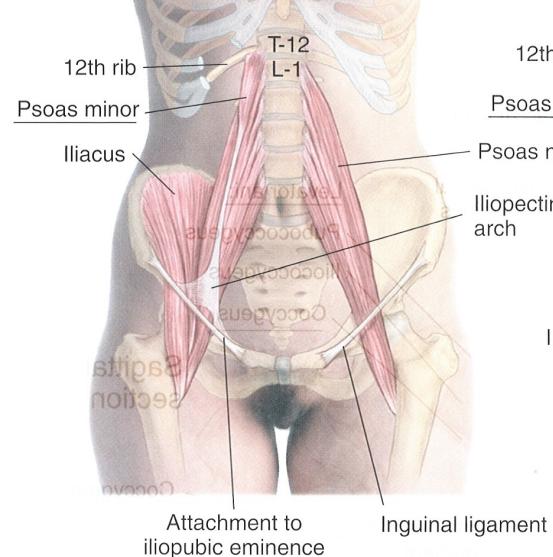


### Attachments

- Superiorly to the bodies of the twelfth thoracic and first lumbar vertebrae and the disk between them
- Inferiorly, to the iliopubic eminence via the iliopectineal arch (iliac fascia)

From the 12th rib and L1 vertebrae, the psoas minor muscle passes anterior to the iliacus muscle to attach to the iliopubic eminence of the pubic bone.

The psoas minor muscle is often absent or small, and its function is usually taken over by the psoas major muscle.



**Figure 8-12** Anatomy of psoas minor



### Action

Assists in flexion of the lumbar spine



### Referral Area

Not applicable



### Other Muscles to Examine

Not applicable



### Manual Therapy

Not applicable

## MUSCLES OF THE PELVIC FLOOR

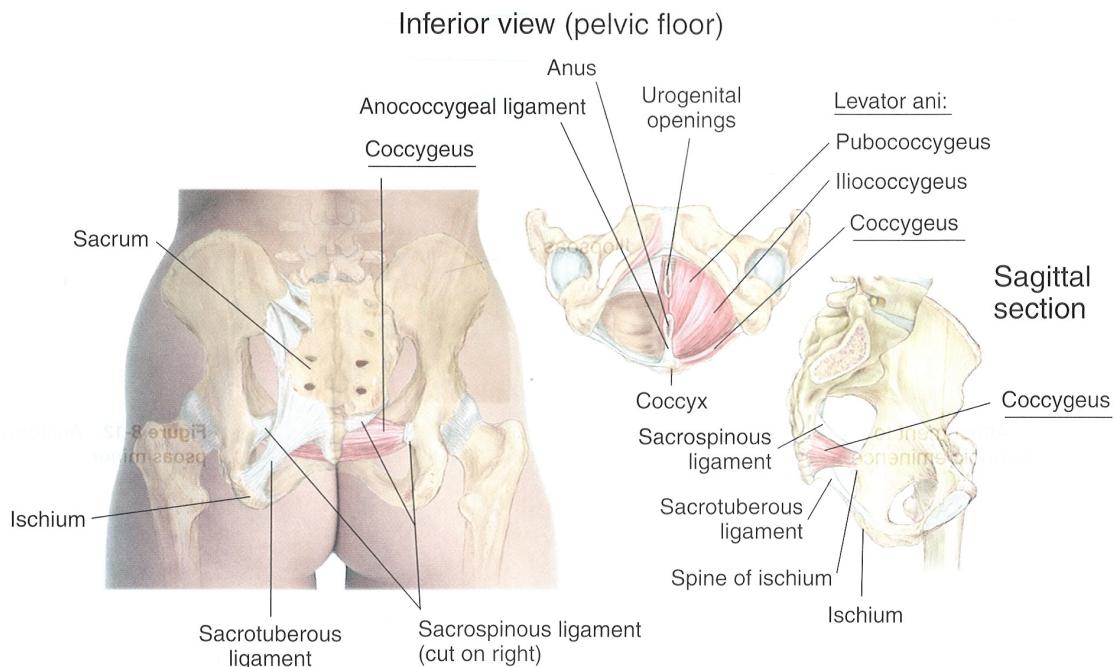
### Overview

The pelvic floor might more usefully be called the pelvic hammock, both for psychological reasons (a hammock sounds softer than a floor) and descriptive reasons. These muscles form a supportive hammock for the pelvic organs, secured to the coccyx behind, the pubis in front, the ischial tuberosities on either side, as well as to various connective tissue structures in between.

The muscle group has openings to admit the rectum, the vagina, and the urethra, and parts of it serve as sphincters for these passages. It is common for people to hold tension in the pelvic floor muscles along with the buttock muscles, and this tension can affect the pelvic organs and cause discomfort in such activities as bowel movements and sexual intercourse.

Some examination and treatment of these muscles can be carried out externally, working between the buttocks and on the perineum, but a thorough and effective treatment will often require internal work through the rectum. Internal examination and treatment of the pelvic floor muscles is an advanced, specialized technique that is beyond the scope of this book.

For external work between the buttocks or on the perineum, the client may lie prone, preferably with a pillow or bolster under the hips.



**Figure 8-13** Anatomy of coccygeus

### Coccygeus (Fig. 8-13)

#### cock-SIDGE-us

Etymology

**Etymology** Latin, relating to the coccyx, from Greek *kokkyx*, cuckoo, coccyx

#### Attachments

- Inferiorly, to the spine of the ischium and the sacrospinous ligament
- Superiorly, to the sides of the lower part of the sacrum and the upper part of the coccyx

#### Action

Assists in the support of the pelvic floor, especially when intra-abdominal pressures increase. Wagging of tail (flexion of coccyx).

**Referral Area**

To the lower sacrum, the coccyx, and the surrounding area (medial aspect of the buttocks)

**Other Muscles to Examine**

- Gluteus maximus
- Obturator internus
- Quadratus lumborum

**Manual Therapy**

See Manual Therapy for the Pelvic Floor Muscles and Obturator Internus, below.

**Levator ani (Fig. 8-14)**

*Ie-VAY-ter AYN-eye*

**Etymology** Latin *levator*, raiser + *ani*, of the anus

**Overview**

Levator ani is comprised of the pubococcygeus, iliococcygeus, and puborectalis muscles, forming the pelvic diaphragm.

**Attachments**

- Anteriorly, to the posterior body of the pubis, the tendinous arch of the obturator fascia, and the spine of the ischium
- Posteriorly, to the anococcygeal ligament, the sides of the lower part of the sacrum and of the coccyx

**Action**

Resists prolapsing forces and draws the anus upward following defecation; helps support the pelvic viscera.

**Referral Area**

To the lower sacrum, the coccyx, and the surrounding area (medial aspect of the buttocks)

**Other Muscles to Examine**

- Gluteus maximus
- Obturator internus
- Quadratus lumborum

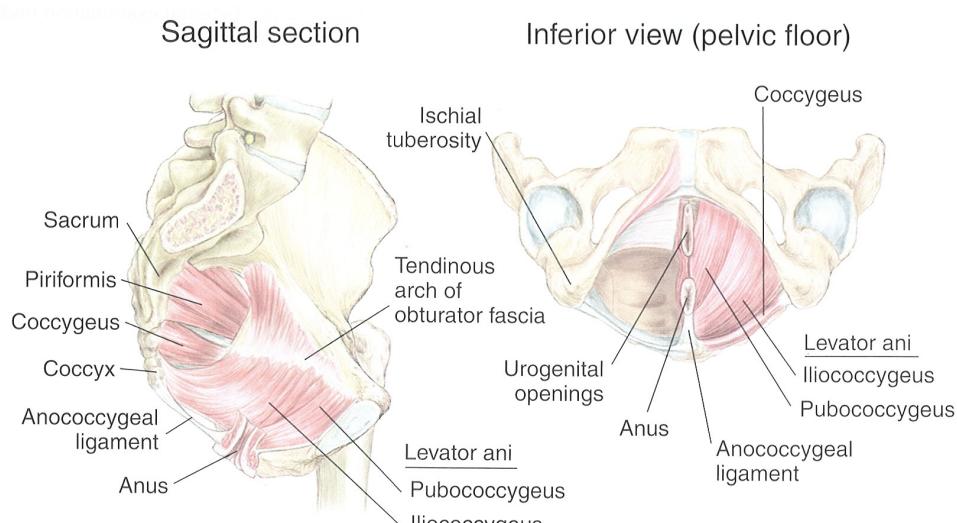


Figure 8-14 Anatomy of levator ani



### Manual Therapy

Levator ani cannot be externally treated effectively.



### Manual Therapy for the Pelvic Floor Muscles and Obturator Internus

#### COMPRESSION

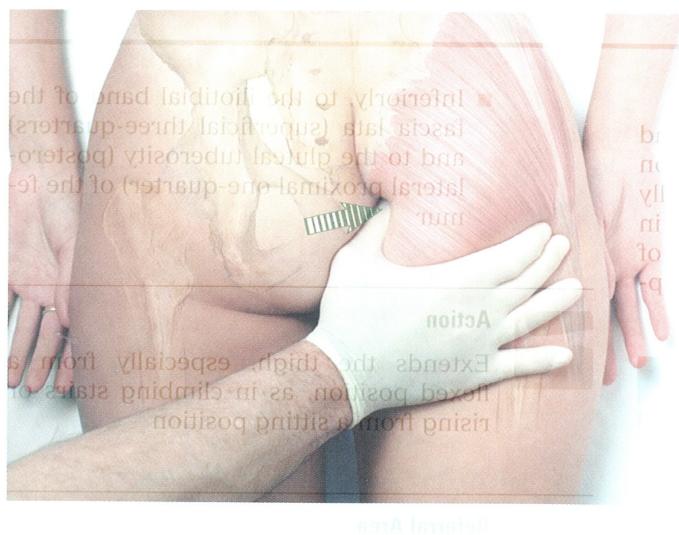
- The client lies prone. A pillow may be placed under the client's pelvis.
- The therapist stands beside the client at the hip.
- Place the palm of the gloved hand nearest the client on the opposite but-

tock, inserting the thumb between the buttocks to rest on the inferior end of the coccyx externally.

- Press firmly under the coccyx (Fig. 8-15), then into the tissue on either side of the coccyx, looking for tender spots. Hold for release.
- Repeat this procedure, shifting the thumb in an inferior direction, exploring the pelvic floor muscles and the inner aspect of gluteus maximus (Fig. 8-16).
- At the level of the obturator foramen, press into the foramen to explore obturator internus, holding for release as necessary (Fig. 8-17).



**Figure 8-15** External examination under the coccyx (Draping option 8)



**Figure 8-16** External examination and treatment between the buttocks (Draping option 8)



**Figure 8-17** Compression of obturator internus (Draping option 8)

## GLUTEAL MUSCLES

### Overview

Since gluteus maximus covers gluteus medius and much of gluteus minimus, much of the work on the buttock applies to all three muscles, especially over the lateral aspect. The only distinction lies in the intention and depth of the work. Therapy of the gluteal muscles will be found after descriptions of all the individual muscles.

### Gluteus maximus (Fig. 8-18)

**GLUE-tee-us MAX-im-us**

**Etymology** Latin *gluteus*, buttock muscle + *maximus*, largest

### Overview

Gluteus maximus is the powerful climbing muscle, antagonist to iliopsoas. It is very commonly involved in low back pain.



### Attachments

- Superiorly, to the ilium behind the posterior gluteal line, to the posterior surface of the sacrum and coccyx, and to the sacrotuberous ligament

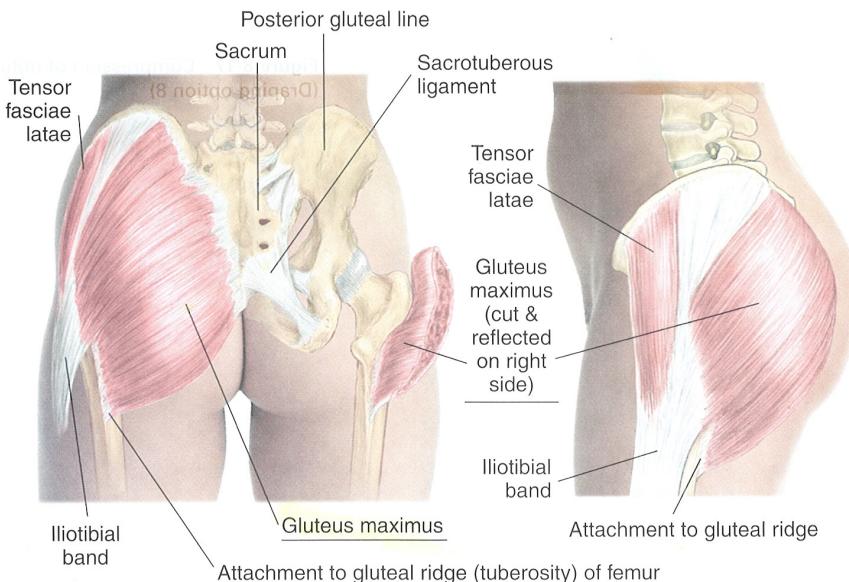


Figure 8-18 Anatomy of gluteus maximus

- Inferiorly, to the iliotibial band of the fascia lata (superficial three-quarters) and to the gluteal tuberosity (postero-lateral proximal one-quarter) of the femur

### Action

Extends the thigh, especially from a flexed position, as in climbing stairs or rising from a sitting position



### Referral Area



To the entire buttock and into the upper posterior thigh



### Other Muscles to Examine

- Other gluteal muscles
- Deep lateral rotators of the hip
- Quadratus lumborum
- Pelvic floor muscle



### Manual Therapy

See Manual Therapy for the Gluteal Muscles below.

Note: For working the medial aspect of gluteus maximus, use the technique for external work between the buttocks described under Pelvic Floor Muscles and Obturator Internus above (Fig. 8-16).

## Gluteus medius (Fig. 8-19)

**GLUE-tee-us ME-dee-us**

**Etymology** Latin *gluteus*, buttock muscle + *medius*, middle

### Overview

Gluteus medius, with gluteus minimus, is a powerful abductor of the hip. It is very commonly involved in low back pain.



### Attachments

- Superiorly, to the ilium between the anterior and posterior gluteal lines
- Inferiorly, to the lateral surface of the greater trochanter

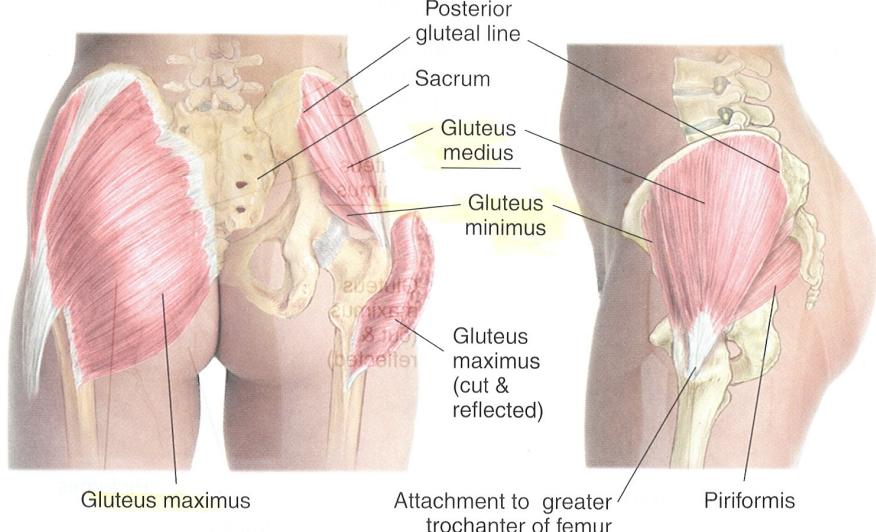


Figure 8-19 Anatomy of gluteus medius



### Action

Abducts and contributes to rotation of the thigh; stabilizes the pelvis in walking



### Referral Area

- Over the buttock
- Over the sacrum
- Into the medial lumbar region
- Into the upper posterior thigh



### Other Muscles to Examine

- Quadratus lumborum
- Lumbar erector spinae muscles
- Other gluteal muscles
- Deep lateral rotators of the hip
- Pelvic floor muscles



### Manual Therapy

See Manual Therapy for the Gluteal Muscles, below.

## Gluteus minimus (Fig. 8-20)

**GLUE-tee-us MIN-im-us**

**Etymology** Latin *gluteus*, buttock muscle + *minimus*, smallest

### Overview

Gluteus minimus, with gluteus medius, is a powerful abductor of the hip. It has a far-ranging pain referral pattern, and is commonly involved in hip and leg pain.



### Attachments

- Superiorly, to the ilium between the anterior and inferior gluteal lines
- Inferiorly, to the greater trochanter of the femur



### Action

Abducts and medially rotates the thigh



### Referral Area

- Over the buttock and lateral hip
- Over the posterior thigh
- Over the posterior calf
- Over the lateral thigh
- Over the lateral calf to the ankle



### Other Muscles to Examine

- Other gluteal muscles
- Deep lateral rotators of the hip
- Tensor fascia latae
- Iliotibial band
- Vastus lateralis
- Hamstrings
- Calf muscles



### Manual Therapy for the Gluteal Muscles

#### MYOFASCIAL STRETCH

- The client lies prone.
- The therapist stands beside the client at the waist, facing the client.
- Place the palm of your cephalad hand on the upper aspect of the client's near buttock, the fingers pointing inferiorly.
- Cross the caudad hand over, placing it on the client's waist at the iliac crest.

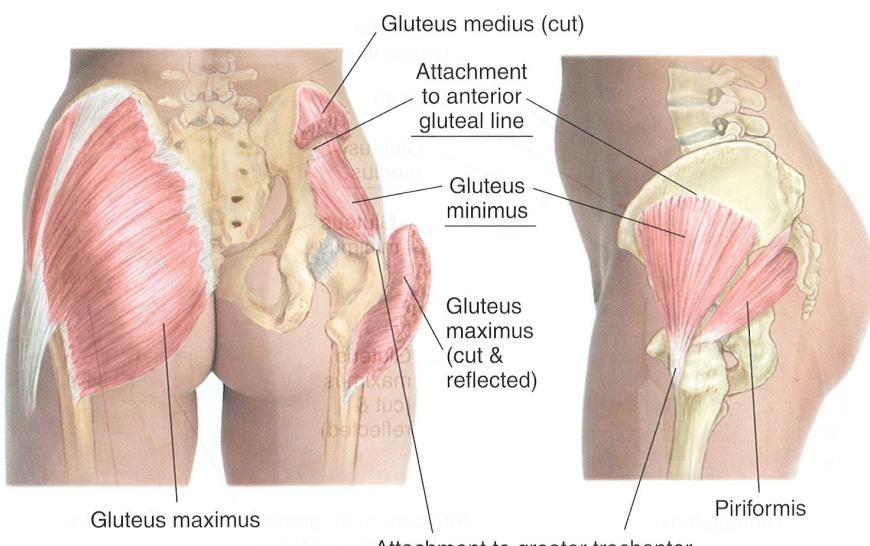


Figure 8-20 Anatomy of gluteus minimus



**Figure 8-21** Myofascial release on gluteal region  
(Draping options 6, 8, 10, underwear or swimsuit)

- Lean into the hands to push them apart, pressing firmly into the tissue (Fig. 8-21).
- Hold this stretch until you feel the underlying fascia release.

#### STRIPPING

- The client lies prone.
- The therapist stands beside the client at the level of the chest.
- Place the palm of the hand on the buttock just above the iliac crest and lateral to the sacrum, the thumb pointing inferiorly (Fig. 8-22A).
- Pressing firmly into the tissue with the heel of the hand, slide the hand along the muscle to its most inferior aspect.
- Beginning just lateral to the previous spot, repeat this procedure until the entire buttock has been covered, including the attachment of gluteus maximus to the iliotibial band, and gluteus minimus along the side of the hip (Fig. 8-22B).
- The same procedure may be carried out with the knuckles (Fig. 8-23), the fingertips (Fig. 8-24), or the supported thumb (Fig. 8-25).

#### STRIPPING

- The client lies on her side, with the lower leg straight and the upper leg flexed at the hip and knee.
- The therapist stands beside the client at the waist.
- Place the supported thumb on the superior lateral aspect of the buttock at the iliac crest.



**Figure 8-22** Stripping of gluteal muscles with the heel of the hand: A, beginning stroke; B, ending stroke (Draping options 6, 8, 10, underwear or swimsuit)



**Figure 8-23** Stripping of gluteal muscles with the knuckles  
(Draping options 6, 8, 10, underwear or swimsuit)

- Pressing firmly into the tissue, slide the thumbs inferiorly along the muscle to its attachments on the greater trochanter (Fig. 8-26).

#### COMPRESSION

- The client lies prone.
- The therapist stands beside the client at the client's waist.
- Place the supported thumb on the lateral aspect of the buttock just inferior to the iliac crest.



**Figure 8-24** Stripping of gluteal muscles with the fingertips  
(Draping options 6, 8, 10, underwear or swimsuit)

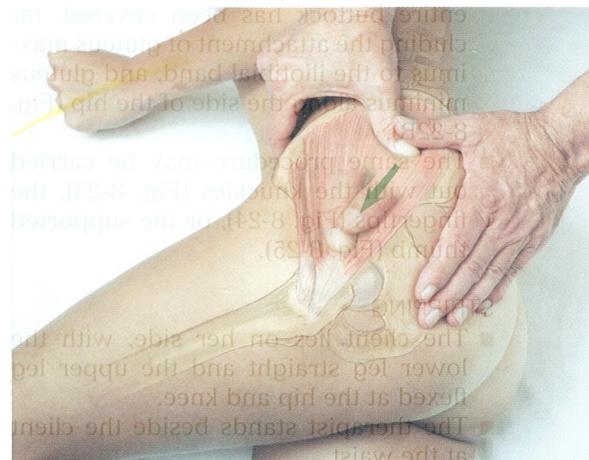


**Figure 8-25** Stripping of gluteal muscles with the thumb  
(Draping options 6, 8, 10, underwear or swimsuit)

- Press firmly into the tissue, moving your thumb back and forth, to search for tender areas. Hold for release (Fig. 8-27).
- Explore the gluteal muscles in this way over the entire buttock.

#### Reversing Anterior Pelvic Rotation

These procedures should be performed after working all the muscles affecting anterior pelvic rotation (quadratus lumborum, gluteal muscles, latissimus dorsi, iliopsoas, rectus femoris, hip adductors).



**Figure 8-26** Stripping of gluteal muscles in side-lying position  
(Draping option 13, underwear or swimsuit)

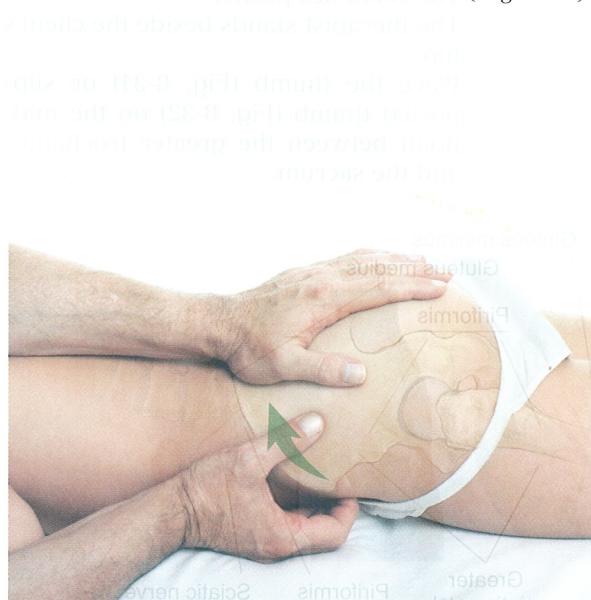


**Figure 8-27** Examination and compression of gluteal muscles (Draping options 6, 8, 10, underwear or swimsuit)

client lies supine with the leg flexed at the hip and knee. Therapist stands beside the client's leg, facing the head.

#### PRONE POSITION

- The client lies prone.
- The therapist stands beside the client at the client's waist.
- Place one hand on the buttock at the iliac crest, the fingers pointing inferiorly. Place the other hand under the ilium with the fingertips on the anterior superior iliac spine (ASIS).
- Simultaneously pull the ASIS in a superior direction while pushing the iliac crest in an inferior direction (Fig. 8-28).



**Figure 8-28** Reversing anterior pelvic rotation in prone position (Draping option 8, 10, underwear or swimsuit)

#### SUPINE POSITION

- The client lies supine, with the leg flexed at the hip and the knee.
- The therapist stands beside the client's leg, facing the head.
- Wrapping the arm nearest the client around the client's leg, place your shoulder firmly just below the knee and the heel of your hand on the ASIS.
- Place your far hand underneath the client's buttock, with the fingertips resting on the iliac crest.
- Ask the client to resist you with 20% of her/his strength as you simultaneously press the leg to the client's chest, push superiorly against the ASIS, and pull inferiorly on the buttock and iliac crest (Fig. 8-29).



**Figure 8-29** Reversing anterior pelvic rotation in supine position (Draping option 5, underwear or swimsuit)

## DEEP LATERAL ROTATORS OF THE HIP

### Piriformis (Fig. 8-30)

**PEER-re-FORM-is**

**Etymology** Latin *pirum*, pear + *forma*, form

#### Overview

Piriformis is a primary lateral rotator of the hip, as well as a principal stabilizer of the hip joint. It has profound clinical significance.

The sciatic nerve may pass under, over, or even through (or partially through) piriformis, depending on the individual. Therefore, a tightened piriformis may cause pain not only through its own referral patterns, but also by entrapment of the sciatic nerve. This entrapment is called *piriformis syndrome*. Piriformis problems are common in ballet dancers because of the constant demand for "turnout" (lateral rotation of the hip) in ballet. It is also very common in general because of its role in stabilizing the hip.



#### Attachments

- Medially and superiorly, to the margins of the anterior pelvic sacral foramina and the greater sciatic notch of the ilium
- Laterally and inferiorly, to the upper border of greater trochanter

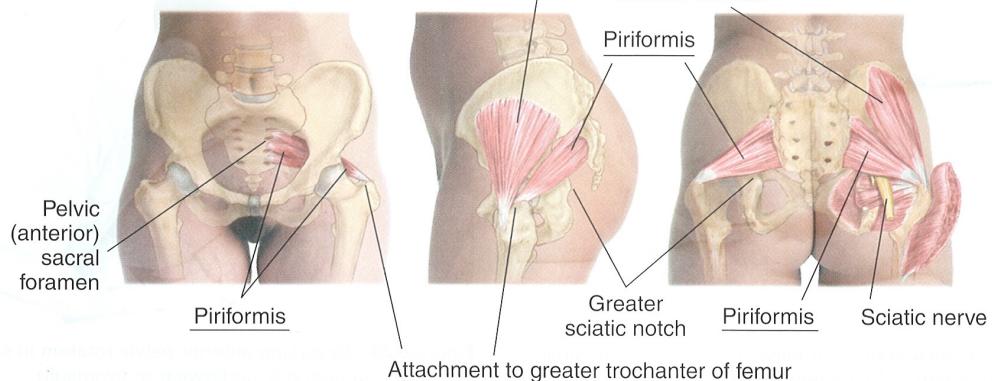


Figure 8-30 Anatomy of piriformis



#### Action

Rotates thigh laterally; assists in abduction of flexed hip; stabilizes hip joint



#### Referral Area

- Over the buttock (especially the lateral border of the sacrum and the inferolateral aspect of the buttock)
- Into the posterior thigh
- By entrapment of the sciatic nerve, over the entire posterior leg to the foot, and into the low back, hip, groin, perineum, and rectum



#### Other Muscles to Examine

- Gluteal muscles
- Other deep lateral rotators of the hip
- Quadratus lumborum



#### Manual Therapy

##### COMPRESSION

- The client lies prone.
- The therapist stands beside the client's hip.
- Place the thumb (Fig. 8-31) or supported thumb (Fig. 8-32) on the midpoint between the greater trochanter and the sacrum.



**Figure 8-31** Compression of piriformis with thumb (Draping option 10)

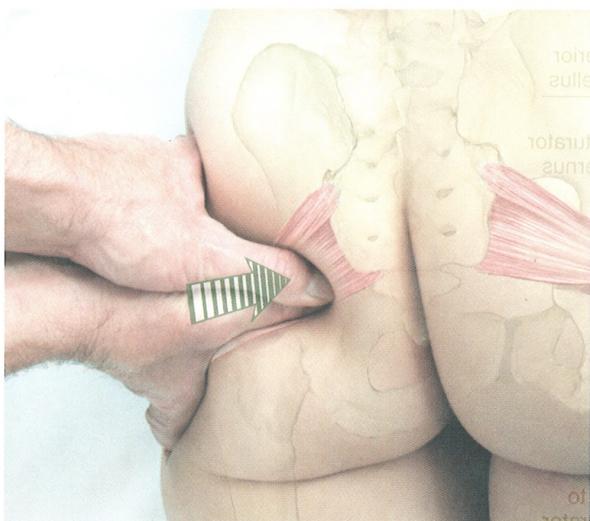


**Figure 8-33** Compression of piriformis attachment at greater trochanter (Draping option 10)

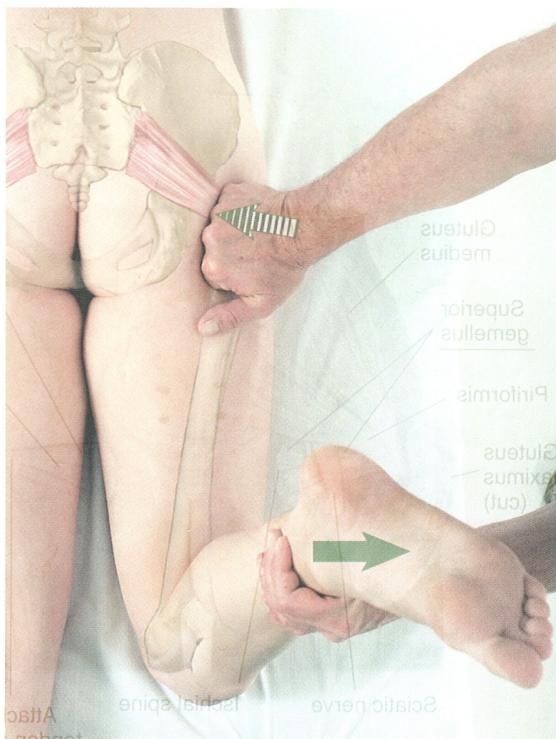
- Press firmly into the tissue, looking for tender areas. Hold for release.
- Explore the entire muscle in this manner, from the sacral border to the attachment on the greater trochanter (Fig. 8-33).

#### COMPRESSION WITH STRETCH

- The client lies prone.
- The therapist stands at the client's hip.
- Place the knuckles of one hand on the buttock just medial to the greater trochanter, pressing firmly in a medial and anterior direction.



**Figure 8-32** Compression of piriformis with supported thumb (Draping option 10)



**Figure 8-34** Passive stretch of piriformis (Draping option 10)

## Superior Gemellus (Fig. 8-35)

*sue-PEER-ee-or je-MELL-us*

**Etymology** Latin *superior*, higher + *gemellus*, diminutive of *geminus*, twin

### Overview

This muscle has no clinical significance separate from piriformis.



#### Attachments

- Medially, to the ischial spine and margin of the lesser sciatic notch
- Laterally, to the medial surface of the greater trochanter via the tendon of obturator internus

From gluteus maximus and piriformis, it passes deep to gluteus medius and obturator internus to attach to the greater trochanter. It is often confused with the piriformis, which originates from the sacrum and ilium and passes deep to gluteus medius and obturator internus to attach to the femur.



#### Action

Rotates thigh laterally; stabilizes the hip joint



#### Referral Area

Not applicable



#### Other Muscles to Examine

Not applicable



#### Manual Therapy

Not applicable

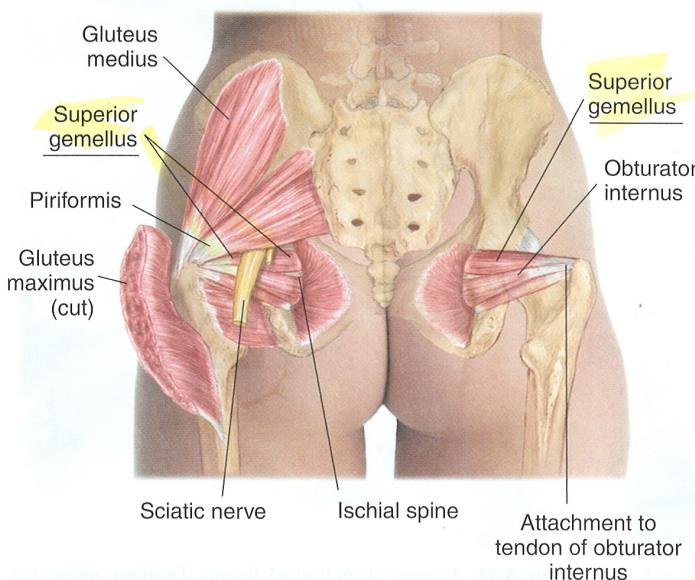


Figure 8-35 Anatomy of superior gemellus.

**Inferior Gemellus (Fig. 8-36)****in-FEER-ee-or je-MELL-us**

**Etymology** Latin *inferior*, lower + *gemellus*, diminutive of *geminus*, twin

**Overview**

This muscle has no clinical significance separate from piriformis.

**Attachments**

- Medially, to the ischial tuberosity
- Laterally, to the medial surface of the greater trochanter via the tendon of obturator internus

Obturator internus  
Ischial tuberosity  
Greater trochanter

**Action**

Rotates thigh laterally

**Referral Area**

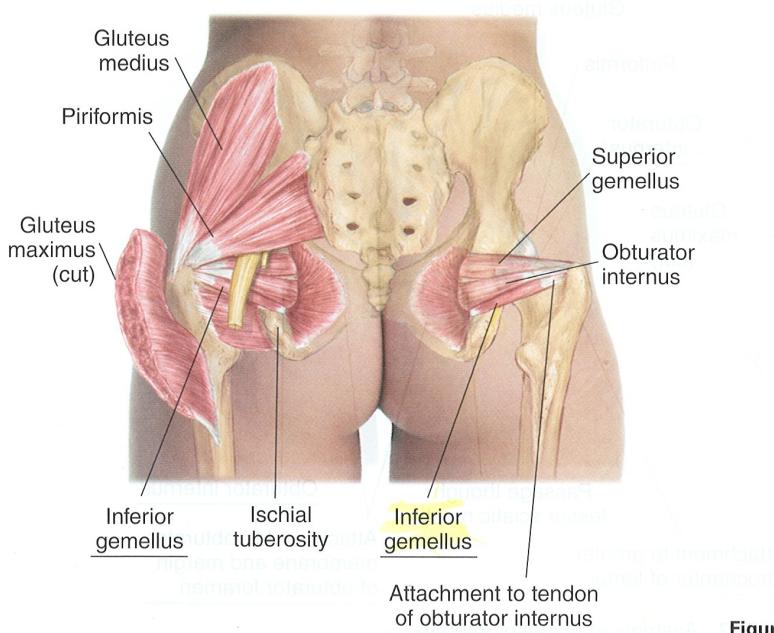
Not applicable

**Other Muscles to Examine**

Not applicable

**Manual Therapy**

Not applicable



**Figure 8-36** Anatomy of inferior gemellus

## Obturator Internus (Fig. 8-37)

**AHB-tu-ray-ter in-TURN-us**

**Etymology** Latin *obturator*, that which occludes or stops up + *internus*, internal

### Overview

Obturator internus has much the same referral pattern as levator ani and coccygeus, discussed above.



### Attachments

- Medially, to the pelvic surface of the obturator membrane and margin of obturator foramen
- Laterally, through the lesser sciatic notch, turning 90° to insert into the medial surface of the greater trochanter



### Action

Rotates thigh laterally; stabilizes the hip joint



### Referral Area

- To the lower sacrum and coccyx
- Into the posterior upper thigh



### Other Muscles to Examine

- Pelvic floor muscles
- Piriformis
- Gluteus maximus



### Manual Therapy

See Manual Therapy for the Pelvic Floor Muscles and Obturator Internus, above (see page 284)

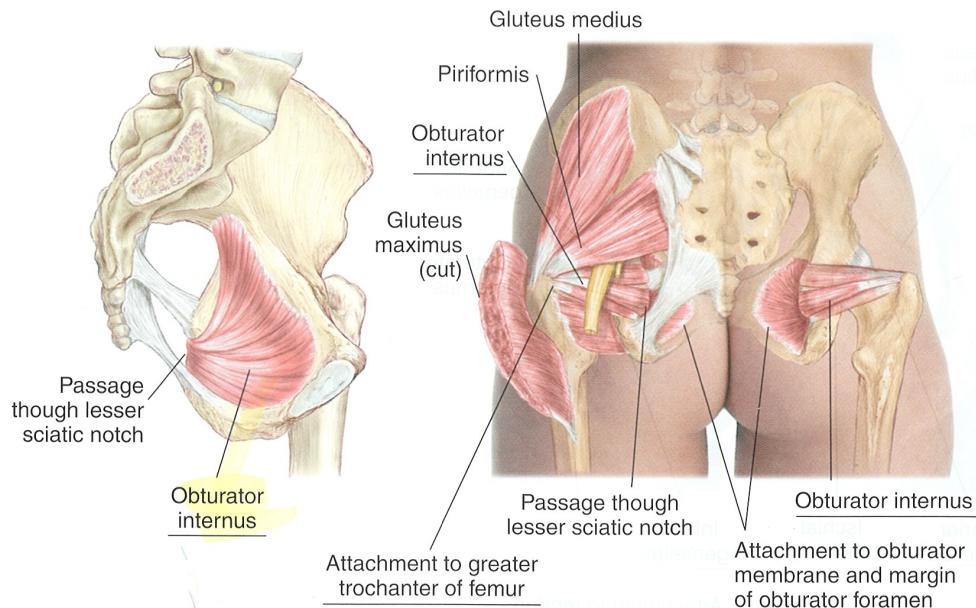


Figure 8-37 Anatomy of obturator internus

## Obturator Externus (Fig. 8-38)

**AH-bu-ray-ter ex-TURN-us**

**Etymology** Latin *obturator*, that which occludes or stops up + *externus*, external

### Overview

Obturator externus may, with quadratus femoris, cause tenderness just medial to the lower aspect of the greater trochanter. This muscle may be palpated deeply in the groin between pectineus and adductor brevis.

#### Attachments

- Medially, to the lower half of margin of obturator foramen and adjacent part of external surface of obturator membrane
- Laterally, to the trochanteric fossa of greater trochanter



#### Action

Rotates thigh laterally; stabilizes the hip joint



#### Referral Area

Just medial to the lower aspect of the greater trochanter

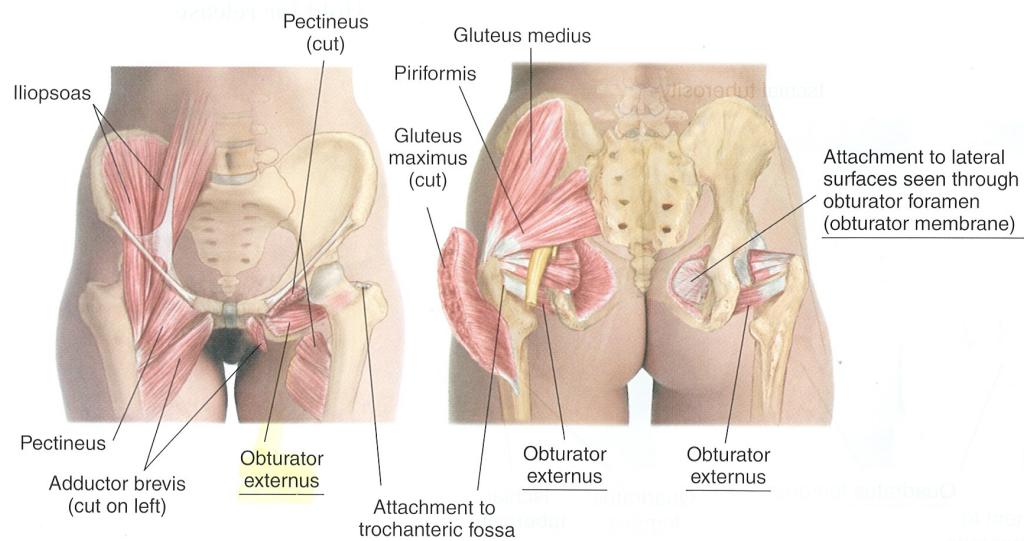


Figure 8-38 Anatomy of obturator externus



Figure 8-39 Compression of obturator externus through the groin (Draping option 5)

#### Other Muscles to Examine

- Quadratus femoris and other deep lateral rotators of the hip
- Pectineus
- Adductor brevis



#### Manual Therapy

##### COMPRESSION

- The client lies supine.
- The therapist stands at the client's knee.
- Using the thumb, locate pectineus and adductor brevis.
- Press firmly and deeply into the tissue between pectineus and adductor brevis exploring for tenderness (Fig. 8-39). Hold for release.

## Quadratus Femoris (Fig. 8-40)

*kwa-DRAY-tus FEM-or-is*

**Etymology** Latin *quadratus*, four-sided + *femoris*, of the femur (thigh bone)

### Overview

Quadratus femoris may, with obturator externus, cause tenderness just medial to the lower aspect of the greater trochanter.



#### Attachments

- Medially, to the lateral border of tuberosity of ischium
- Laterally, to the intertrochanteric crest



#### Action

Rotates thigh laterally

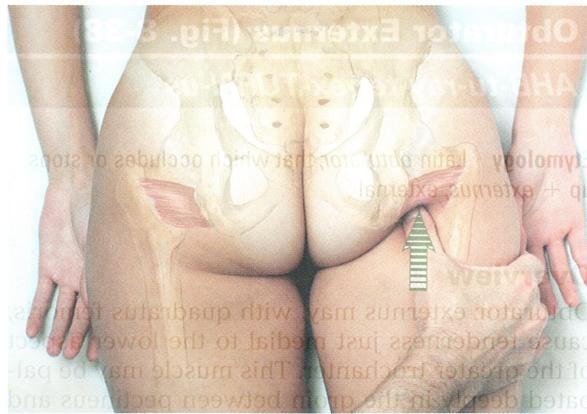
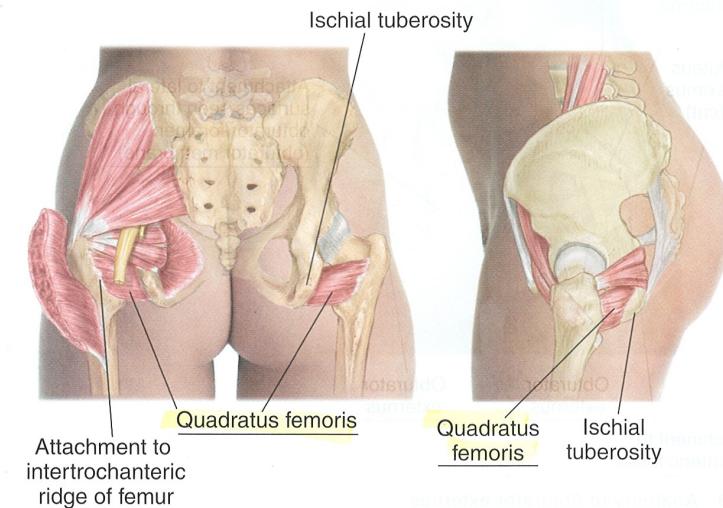


#### Referral Area

With obturator externus, just medial to the lower aspect of the greater trochanter

■ *Obturator externus*—causes tenderness just medial to the lower aspect of the greater trochanter

■ *Quadratus femoris*—causes tenderness just medial to the lower aspect of the greater trochanter



**Figure 8-41** Compression of quadratus femoris (Draping option 10)



#### Other Muscles to Examine

- Obturator externus
- Other deep lateral rotators of the hip



#### Manual Therapy

##### COMPRESSION

- The client lies prone.
- The therapist stands at the client's knee.
- Place the thumb at the crease of the buttock between the ischial tuberosity and the greater trochanter.
- Press firmly in a superior direction, exploring for tender areas (Fig. 8-41). Hold for release.

**Figure 8-40** Anatomy of quadratus femoris