樂動預健及物理治療中心
Happy Prehab Physiotherapy Centre

Knee Pain

Physiotherapy Leaflet

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Overpronation of the Foot

Overpronation of the foot is frequently associated with knee pain and lower limb discomfort, either directly or indirectly. The primary cause often involves a collapsing foot arch or flatfoot. This biomechanical change causes the hindfoot, ankle, lower leg, knee, and thigh to rotate internally, disrupting proper alignment of the lower limb joints. Additionally, this internal rotation causes knee valgus, which pulls on the medial muscles, ligaments, and other soft tissues.

Furthermore, weakness in muscles such as the gluteus medius, hamstrings, calves, and the plantar fascia—particularly the gluteus medius and hamstrings—can exacerbate these issues. The malalignment of the foot results in abnormal biomechanics, which can lead to most of the lower limb issues.

This condition may give rise to a range of symptoms and foot issues, including bunions, plantar fasciitis, ankle instability, tibial pain, leg fatigue, knee pain, and back pain.

Physiotherapy

In the field of physiotherapy, the goal is to release tight muscles, mobilize stiff joints, and strengthen the muscles surrounding the knee to reduce stress on the knee joint. For example, strengthening the quadriceps can help maintain basic daily activities such as standing, walking, and climbing stairs. While strengthening the hamstrings can make activities like ascending slopes feel more powerful and also improve athletic performance. It helps stabilize the knee joint effectively, which is beneficial during actions like grabbing a rebound and landing, sprinting, sudden stops or changing directions while running, thereby reducing the risk of injury.

Patients with knee pain can refer to the exercises in the brochure, which may also help improve pain caused by biomechanical issues in the lower limbs.

圖 3. 膝周肌群 - 股四頭肌

圖 4. 膝周肌群 - 腘繩肌

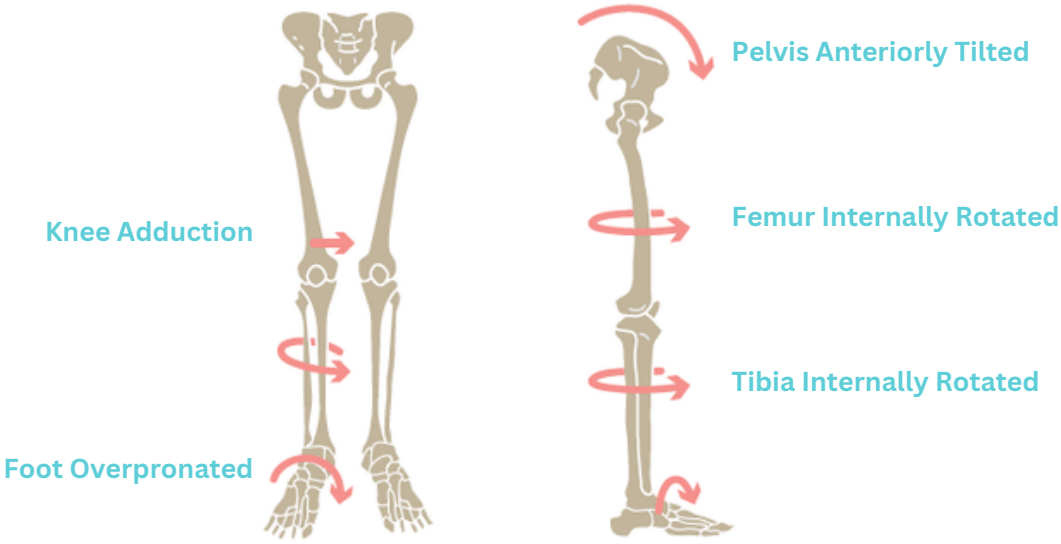


Fig. 1 The Impact of Over Foot Pronation on Lower Limb Biomechanics

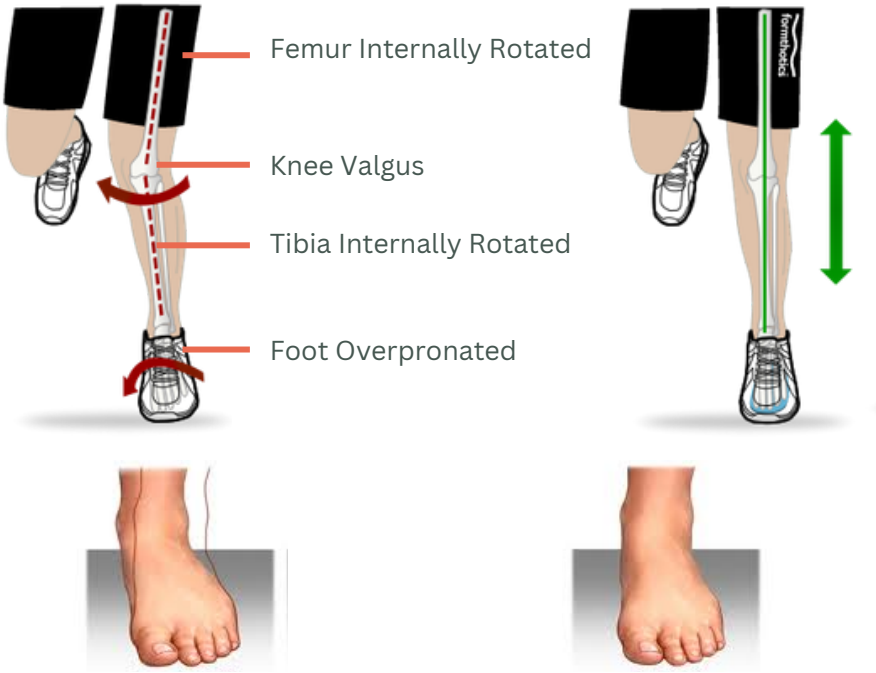


Fig. 2 The Impact of Over Foot Pronation on Lower Limb Biomechanics - Before and After

Choosing a Proper Footwear

Fig. 5 A reference for choosing a proper footwear

Choose shoes with stable structure, or consider wearing orthotic insoles to support the arches, allowing the arches to return to their natural shape and restoring proper alignment of the lower limb joints. This helps improve issues caused by lower limb mechanics that lead to knee pain.

Stretching | Quadriceps

Stretching the muscles at the front of the thigh usually helps to alleviate knee joint pain.

fig. 6 Ending position

1. Lie face down, bend your knees, and use your left hand to pull your right foot up. Hold for 5 - 10 seconds, 10 sets.
2. During the process, keep your pelvis neutral, knee together and both feet planted firmly. Repeat the other side.

Stretching | Hamstrings

Relaxing the muscles and fascia connecting the lower back to the hips, back of the thighs, and calves can help reduce various types of lower limb pain.

fig. 7 Ending position

1. Loop a resistance band around the sole of your foot, using your hands to assist in straightening the knee until you feel a stretch at the back of the thigh and leg.
2. Hold for 5–10 seconds, 10 sets. Repeat the other side.

Strengthening | Clamshell

Targeting muscles: Gluteus medius – reduce internal rotation of the lower limbs.

fig. 8a Starting position

fig. 8b Starting position

1. Lie on your side, with the hip flexed about 45 degrees and the knee flexed about 90 degrees.
2. Place a resistance band around both knees.
3. Open the knees apart by moving the upper knee outward and rotating the hip outward, while keeping your heels close together, then slowly lower the upper knee down.

Throughout the movement, try to maintain the normal curvature of your back and tilt your pelvis neutral. When opening the knees outward, the pelvis should remain stable and should not rotate along with the knee.

Strengthening | Hamstring Bridge

fig. 11 - beginning ver. - glute bridge

fig. 12 - intermediate ver. - hamstring bridge

fig. 13 - advanced ver. - single leg bridge

1. Lie flat on your back with both knees bent and feet flat on the bed, pelvis apart.
2. Use your thigh and glute muscles to lift your hips until your lower back, hip and thighs are in a straight line.
3. Hold for 5 seconds, repeat 10 times.

Advanced version – Slightly straighten the legs until they are slightly bent when lifting the hips, feeling more engagement in the back of the thighs. You can also try lifting one leg at a time. Ensure that the pelvis, knees, and feet are always aligned and pointing in the same direction throughout the exercise.

Strengthening | Hamstring Curl

Targeting muscles: Hamstrings and Gluteals

fig. 14a - starting position

fig. 14b - demonstration

fig. 14c - ending position

1. Lie flat on your back, place an elastic band around your knees, with your feet bent and your soles resting on the foam roller.
2. Engage your thighs and glutes, lift your hips until your lower back and thighs are in a straight line.
3. Roll the foam roller away from you until your knees are slightly bent.
4. Curl the foam roller back to the starting position and repeat the movement.

Strengthening | Wall Squats / Squats

Targeting muscles: Quadriceps and Gluteals

Proper Technique

The knee and second toe should be aligned in the same direction

fig. 15a Wall Squat Demonstration

Improper Technique

The knee and second toe is not pointing in the same direction

fig. 15b Knee Valgus

fig. 15b Knee Varus

Throughout the entire process, pay attention to the alignment of the lower limb joints, ensuring that the knee joint and the foot arch do not undergo inward direction. The knee should be aligned in the same direction as the second toe.

1. Stand with your feet shoulder-width apart, toes slightly pointed outward.
2. Maintain a straight back, and slowly bend your knee and hip simultaneously to squat down.
3. Engage your thigh and gluteal muscles to stand up.
4. Advanced variation: add a resistance band placed above your knees for added challenge to your gluteal medius.

Strengthening | Lunges

Targeting muscles: Quadriceps, Gluteals and Calf

Proper Technique

The knee and second toe should be aligned in the same direction

Fig. 16a lunges proper demonstration

Improper Technique

The knee and second toe is not pointing in the same direction

Fig. 16b lunges improper demonstration

1. Step forward with one leg, making sure both legs are hip-width apart. Bend both knees to about 90 degrees.
2. Keep your torso upright at all time.
3. Push through both legs and return to standing.
4. Repeat on the other side.

Advanced variation: forward lunges/ backward lunges

Myofascial Self-Release

Use a massage ball or foam roller to do a myofascial self-release for yourself.

fig. 17 Demonstration - Quadriceps

fig. 18 Demonstration - ITB/ Tensor fasciae latae/ Vastus lateralis/ Bicep femoris (Lateral thigh)

fig. 18 Demonstration - Vastus medialis/ sartorius/ semitendinosus/ adductos (Medial thigh)

Myofascial Self-Release

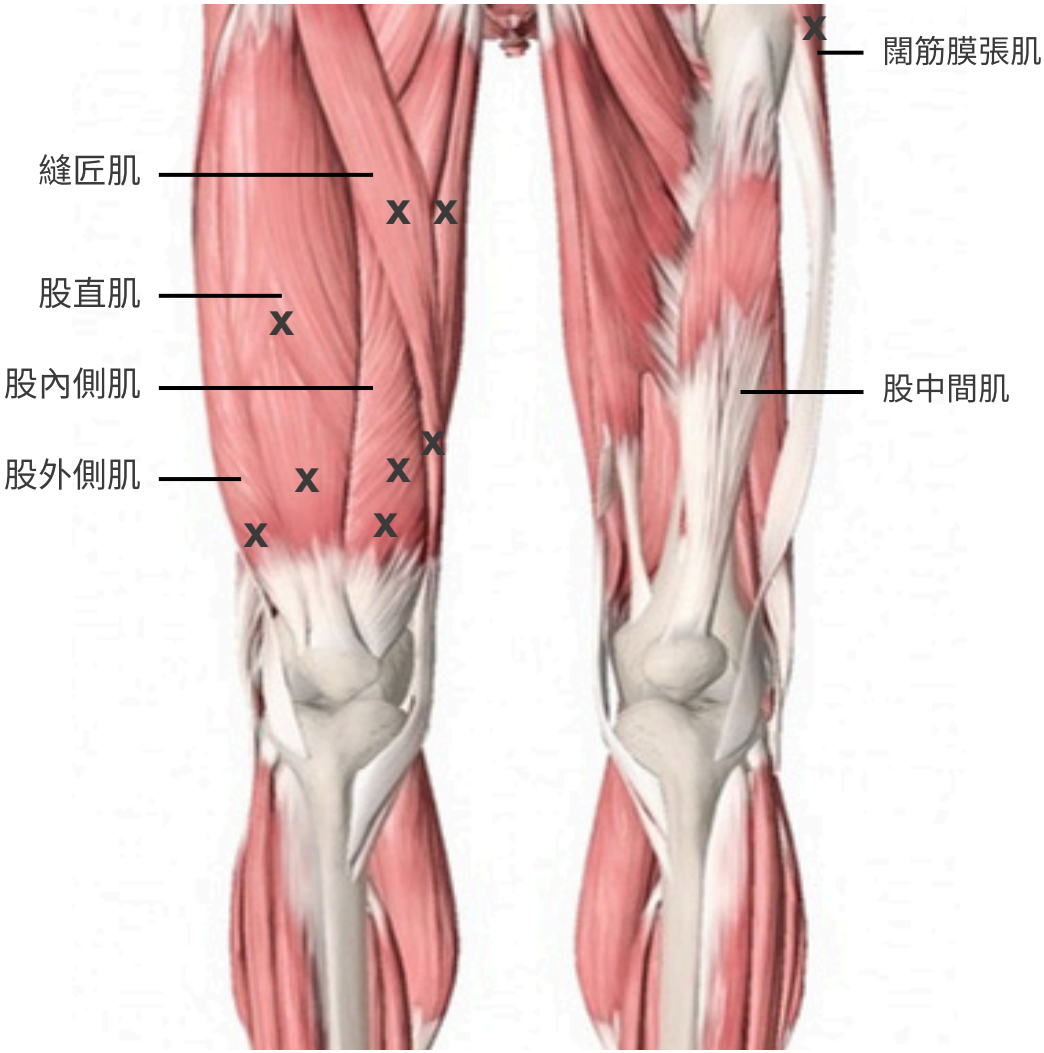
Use a massage ball or foam roller to do a myofascial self-release for yourself.

fig. 19 Demonstration - gluteus medius/gluteus maximus/piriformis/tensor fasciae latae

fig. 19 Demonstration - tibialis posterior/gastrocnemius/ soleus/ fibilaris longus

fig. 19 Demonstration - tibialis anterior/ extensor digitorum longus

肌肉解剖圖及激痛點
Muscle Anatomy and Trigger Points

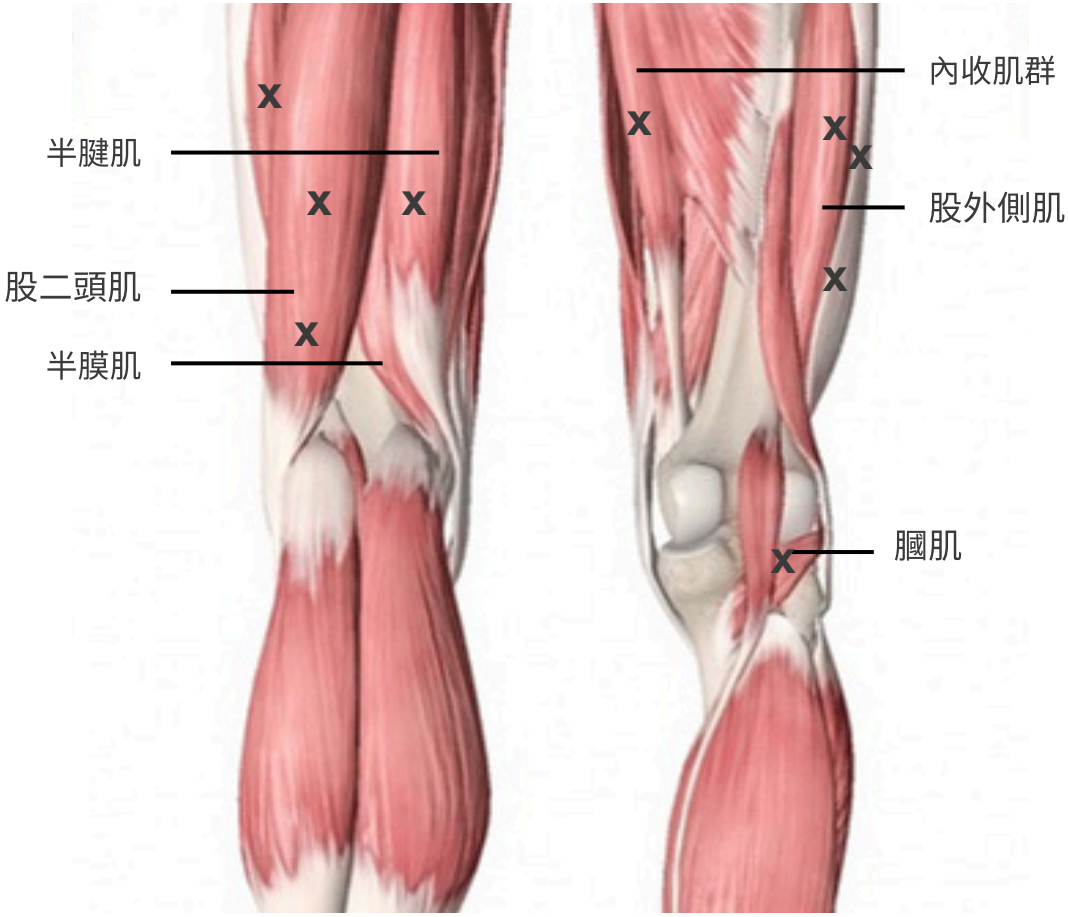


淺層肌肉
Superficial

深層肌肉
Deep

前 Anterior

肌肉解剖圖及激痛點
Muscle Anatomy and Trigger Points



淺層肌肉
Superficial

深層肌肉
Deep

後 Posterior

樂動預健及物理治療中心
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預防+治療
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職業勞損

關節退化

運動創傷

筋骨痛症

3612 9188 (如有任何問題或想預約服務 可WhatsApp查詢)

香港銅鑼灣百德新街2-20號恆隆中心19樓1904室