

Sciatic Nerve

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The Sciatic Nerve

- Largest and strongest peripheral nerve in the body
- Originates from spinal roots:
 - L4, L5, S1, S2, S3
- Travels through posterior pelvis and thigh
- Supplies:
 - Posterior thigh muscles
 - Lower leg muscles
 - Most of the foot

Main Functions

- Motor supply
- Sensory supply
- Autonomic fibers

Components of the Sciatic Nerve

Two Divisions

- **Tibial Division**
 - Medial component
 - Larger branch
- **Common Peroneal Division**
 - Lateral component
 - Smaller branch
- **Important Note**
 - Both nerves usually travel together
 - Separate near the popliteal fossa
 - In ~10% of population:
 - remain separate throughout course

Pathway of the Sciatic Nerve

- **Course of the Nerve**
- Leaves sacral plexus
- Passes through greater sciatic foramen
- Usually travels inferior to piriformis
- Passes between:
 - Ischial tuberosity
 - Greater trochanter
- Travels deep to gluteus maximus
- Descends posterior thigh
- Divides near popliteal fossa

Clinical Relevance

- Piriformis compression may irritate nerve
- Trauma in gluteal region may injure nerve

Tibial Nerve Pathway

Tibial Division

- **Travels:**
 - Through popliteal fossa
 - Between heads of gastrocnemius
 - Posterior compartment of leg
 - Behind medial malleolus
 - Under flexor retinaculum
- **Ends As:**
 - Medial plantar nerve
 - Lateral plantar nerve



Muscles Innervated by Tibial Nerve

- **Posterior Compartment Muscles**

- Gastrocnemius
- Soleus
- Plantaris
- Popliteus
- Tibialis posterior
- Flexor hallucis longus
- Flexor digitorum longus

- **Intrinsic Foot Muscles**

- Abductor hallucis
- Abductor digiti minimi
- Adductor hallucis
- Lumbricals
- Interossei
- Flexor digitorum brevis

Sensory Supply of Tibial Nerve

- **Sensory Distribution**
- **Supplies:**
 - Posterior leg
 - Heel
 - Sole of foot
 - Plantar toes
- **Sural Nerve**
- Formed by tibial + common peroneal branches
- **Supplies:**
 - Lateral foot
 - Posterior-lateral lower leg

Common Peroneal Nerve Pathway

- **Common Peroneal Division**
- **Travels:**
 - Through popliteal fossa
 - Around fibular head
 - Very superficial at fibular neck
- **Divides Into:**
 - Deep peroneal nerve
 - Superficial peroneal nerve

Clinical Importance

- Easily injured by compression or trauma



Deep Peroneal Nerve

- **Motor Supply**
- Tibialis anterior
- Extensor digitorum longus
- Extensor hallucis longus
- Peroneus tertius
- Extensor hallucis brevis
- Extensor digitorum brevis
- **Function**
- Dorsiflexion
- Toe extension

Superficial Peroneal Nerve

- **Motor Supply**
- Peroneus longus
- Peroneus brevis
- **Function**
- Foot eversion
- **Sensory Supply**
- Distal anterior leg
- Dorsum of foot
- Most toes



Hamstring Innervation

- **Sciatic Nerve Supplies**
- **Tibial Division**
- Semitendinosus
- Semimembranosus
- Long head of biceps femoris
- Part of adductor magnus
- **Common Peroneal Division**
- Short head of biceps femoris

Causes of Sciatic Nerve Lesions

- **Traumatic Causes**

- Pelvic fractures
- Femur fractures
- Tibia fractures
- Fibular head fractures
- Hip dislocation
- Knee dislocation
- Ankle injuries

Compression Causes

- **Internal Compression**
- Piriformis syndrome
- Ganglion cysts
- Tarsal tunnel syndrome
- Morton's foot structure
- **External Compression**
- Casts
- Splints
- Crossing legs
- Prolonged squatting
- **Common Site**
- Fibular head compression

Iatrogenic Causes

- **Medical Causes**

- Improper gluteal injections
- Hip surgery
- Meniscal repair
- Surgical positioning
- Traction after surgery
- **Most Commonly Affected**
- Common peroneal nerve

- **Types of Nerve Injury**
- **Neuropraxia**
 - Mild injury
 - Temporary conduction block
 - No axon damage
- **Axonotmesis**
 - Axon damage occurs
 - Connective tissue preserved
 - Recovery slower

Foot Drop

- **Classic Presentation**
- **Due To:**
 - Paralysis of dorsiflexors
 - Paralysis of evertors
- **Position of Foot**
 - Plantarflexed
 - Inverted
- **Gait Pattern**
- **Steppage Gait**
 - High stepping walk
 - Toes strike first



Claw Toe Deformity

- **Seen in Tibial Nerve Lesions**
- **Presentation**
 - Hyperextension at MCP joints
 - Flexion at IP joints
- **Cause**
 - Muscle imbalance
 - Intrinsic foot muscle weakness

Muscle Wasting

Areas of Atrophy

- **Sciatic Lesion**
- Hamstrings
- **Common Peroneal Lesion**
- Anterior compartment wasting
- **Tibial Lesion**
- Posterior calf wasting
- Intrinsic foot muscle wasting

Sensory Changes

- **Tibial Division Lesion**
- **Altered Sensation**
- Posterior leg
- Heel
- Sole of foot
- Plantar toes



Sensory Changes in Peroneal Lesion

- **Altered Sensation**

- Lateral lower leg
- Anterior lower leg
- Dorsum of foot

- **Anesthesia**

- Web space between:
 - Great toe
 - Second toe

Autonomic Changes

Tibial Division Contains Most Autonomic Fibers

- **Lesions May Cause:**
- Edema
- Trophic skin changes
- Dry skin
- Poor tissue nutrition
- **Severe Pain**
- Causalgia may occur

Differential Assessment

- **Differentiate From L4-L5 Radiculopathy**
- **Radiculopathy**
- Weak foot inversion
- Tibialis posterior weakness
- Sensory loss high on lateral leg
- **Peroneal Nerve Lesion**
- Foot drop
- Weak dorsiflexion
- Weak eversion
- Sensory loss entire lateral lower leg

Clinical Assessment

- **Observe**
- Gait abnormalities
- Foot drop
- Muscle wasting
- Claw toes
- **Test**
- Dorsiflexion
- Eversion
- Plantarflexion
- Toe extension
- **Sensory Testing**
- Heel
- Sole
- Dorsum of foot
- Web spaces

Massage Therapy Considerations

RMT Considerations

- **Avoid Excess Compression Over:**

- Fibular head
- Popliteal fossa
- Piriformis region

- **Helpful Techniques**

- Myofascial release
- Gentle neuromuscular work
- Stretching surrounding tissues
- Edema reduction techniques

Caution

- Severe neurological symptoms require referral

Red Flags for Referral

Immediate Referral Needed If:

- Sudden foot drop
- Progressive weakness
- Severe sensory loss
- Loss of bowel/bladder control
- Severe trauma history
- Suspected fracture/dislocation



Piriformis Syndrome

- **Definition**
- Compression or irritation of the sciatic nerve by the piriformis muscle.
- **Causes**
- Prolonged sitting
- Overuse
- Trauma to gluteal region
- Muscle spasm
- Biomechanical imbalance



- **Symptoms**

- Deep gluteal pain
- Pain radiating down posterior leg
- Tingling or numbness
- Pain with sitting

- **Important**

- Usually affects the tibial division first.

