



Chronic Exertional Compartment Syndrome

What is it?

Chronic exertional compartment syndrome (CECS) is a condition where pressure is increased inside the ‘compartments’ where muscles reside. This internal swelling reduces blood flow and compresses nerves to that area, which can cause pain, numbness, and difficulty using the affected muscles. CECS **occurs primarily in the lower leg**, though it has been seen in the forearm and other places.

What causes it?

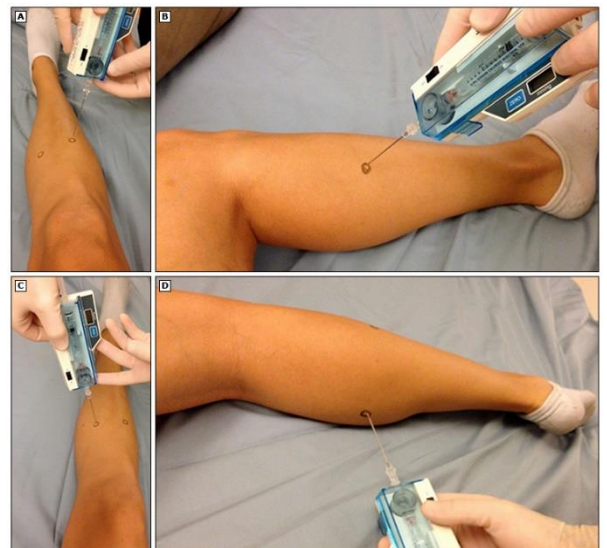
The exact cause of CECS is not completely understood. It is thought that during extensive exercise, muscles can expand as much as 20% in volume, but the fascial sheath surrounding them cannot expand any further and becomes ‘stiff’. As the pressure builds, it prevents blood flow from supplying muscles and nerves with much needed oxygen and nutrients. It **typically affects young endurance athletes**, especially runners and military soldiers. It is also commonly seen in sports such as soccer, lacrosse, or field hockey.

What are the symptoms?

Classically CECS will start to cause pain at the same point of a workout (ie: 4 miles into a run), and will progressively worsen. The pain may be described as **aching, squeezing, cramping, tightness, or pressure**. Symptoms are often bilateral and will slowly regress after activity has stopped and the muscle becomes less taut.

How is it diagnosed?

The gold standard for diagnosis of CECS is exertional compartment testing. This is done by inserting a special catheter to measure the pressure in each compartment before and after exercise. Because exertional compartment testing is not universally available, **often the diagnosis is made by history & physical exam**. Exertional compartment testing should be done prior to surgical consideration, and other causes should be ruled out.



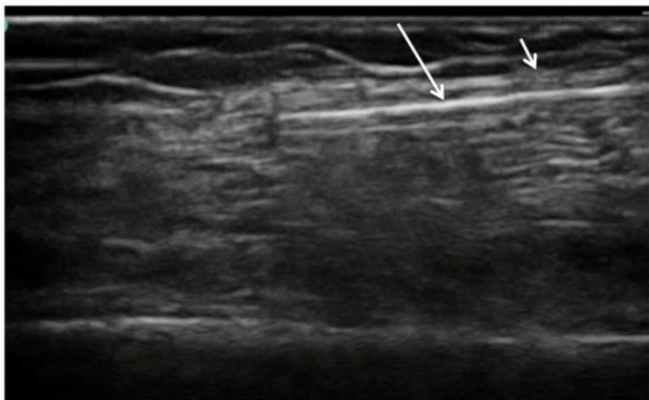


How is it prevented?

- Running on soft surfaces like grass, dirt trails, and forgiving synthetic tracks.
- Reducing training volume. Cross-train to maintain fitness, and gradually increase running once symptoms resolve.
- Use proper footwear with good support when running and consider using orthotics.

How is it treated?

- Icing the affected area after running/training.
- **Physical therapy** including strength training and increasing flexibility of the lower extremities as well as modalities such as **dry needling** and/or **Instrument Assisted Soft Tissue Mobilization (IASTM)** may help to break up tight muscles and fascial adhesions.
- Gait re-training has shown to help improve symptoms.
- [Osteopathic Manipulative Treatment](#) can be used to break up fascial adhesions and to enable better blood flow to the affected tissues.
- [Trigger point injections](#) can be used to release tight and restricted muscles that may be facilitating CECS.
- [Extracorporeal Shockwave Therapy \(ESWT\)](#) can be used to break up fascial adhesions and promote an influx of healing factors to allow the soft tissue to properly heal.
- [Ultrasound guided fasciotomy](#) is a newer non-surgical treatment where the sports medicine physician uses a device called a **meniscotome** to release the entrapped fascial compartments.
- If conservative measures fail to improve this condition, referral to an orthopedic surgeon is appropriate. A procedure called **surgical fasciotomy** may be performed to relieve the pressure inside the muscle compartment.



Real-time ultrasound image of blunt tunneling (*long white arrow*) device passing immediately deep to fascial plain (*short white arrow*)

