CQ HAND + UPPER LIMB
SPECIALIST ORTHOPAEDIC SURGEON

PATIENT INFORMATION — IN DEPTH

Radial Tunnel Syndrome

Radial tunnel syndrome causes aching pain in the upper outer forearm, just below the elbow.

What you're feeling

You may notice a deep, aching pain on the outer side of your elbow. This discomfort often travels down the top of your forearm toward your thumb and index finger. Unlike the sharp sting of a sprain, this pain feels more like a persistent bruise or tightness in the muscles. You might feel a dull soreness that lingers long after you have stopped moving your arm.

The pain typically worsens when you use your forearm muscles. Activities that require repetitive gripping or twisting can trigger flare-ups. For example, turning a heavy door handle, using a screwdriver, or lifting a kettle full of water may cause the ache to intensify. You might also feel tenderness when pressing on the outer bump of your elbow. Simple tasks like shaking hands or holding a phone for a long time can become uncomfortable as the day goes on.

You may find that resting your arm provides some relief, but the discomfort often returns with activity. Many people report that the pain is more noticeable at night, especially if you sleep on the affected side. Waking up with a stiff or sore forearm is common. You might also notice that your grip feels weaker than usual, making it harder to open jars or carry shopping bags.

It is important to understand that the 'radial tunnel' is not a narrow pipe or canal. Instead, it refers to a stretch of path where your radial nerve runs. Along this path, several separate structures can press on the nerve. These pressure points include the edge of a muscle, a fibrous band of tissue, or a small group of crossing blood vessels. When any of these structures compress the nerve, it causes the pain and weakness you are experiencing. Your surgeon will look for these specific areas of compression to guide your treatment.

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What's actually happening

The name 'radial tunnel' can be misleading. There is no single narrow pipe or canal in your arm. Instead, think of your radial nerve as a long electrical cable running down the back of your upper arm and into your forearm. The 'tunnel' is simply a stretch of path where this cable passes close to several different structures.

Along this path, the nerve can get squeezed or irritated by multiple separate pressure points. One point might be the edge of a muscle. Another could be a tight band of fibrous tissue. A third might be a small group of crossing blood vessels. Because these structures are close together, any one of them can press against the nerve and cause pain or weakness.

This compression is what causes your symptoms. When the nerve is pinched, it sends signals of pain to the outside of your forearm and wrist. It may also affect the muscles that help you lift your wrist or fingers. The pain often feels like a deep ache or burning sensation.

In many cases, this irritation happens without a clear injury. Sometimes it develops slowly over time due to repetitive movements. If conservative treatments do not help, your surgeon may consider surgery to relieve the pressure. This involves carefully releasing the structures that are squeezing the nerve. The goal is to give the nerve more space so it can heal and function normally again.

Understanding that there are several potential pressure points helps explain why diagnosis can be tricky. It also shows why a thorough examination is important. Your surgeon will look for signs of nerve irritation in specific areas along this path. This helps determine which structure might be causing the problem and guides the best treatment plan for you.

What we can do about it

Dr Kieran Hirpara, an upper-limb surgeon at Mater Private Hospital Rockhampton, starts with the least invasive options that suit your condition.

We begin with self-management and physiotherapy. This approach aims to reduce pressure on the radial nerve by changing how you use your arm. Your physiotherapist will guide you through gentle exercises to improve strength and flexibility. We typically advise giving this non-surgical care a fair trial before considering other steps. If your symptoms persist despite these efforts, we may discuss medical management to help control pain and inflammation.

Medical options include pain medication and anti-inflammatory drugs to manage discomfort. In some cases, we may recommend an injection. Cortisone injections can reduce swelling around the nerve, while hyaluronic acid or platelet-rich plasma (PRP) injections aim to support tissue health. These treatments provide relief for a limited time, helping you stay active while your body heals. If conservative care does not bring enough improvement, we review your progress carefully.

Surgery is considered when non-surgical options have not given enough relief. We may recommend surgical decompression to release the pressure points along the nerve's path. This involves identifying and protecting the radial nerve to ensure it has space to function normally. Surgery is also an option for acute injuries where

early intervention can improve the chance of regaining nerve function. Patients who undergo surgical exploration within 3 weeks of injury had a significantly higher likelihood of regaining radial nerve function than patients who underwent nonsurgical management with or without late surgical exploration. We discuss all risks and benefits with you to make a shared decision about your care.

Patients are generally referred to our clinic by their GP; if a physiotherapist has suggested you see us, you will still need a referral from your GP in order to be eligible for the Medicare rebate. A clinic assessment establishes the diagnosis. For degenerative or long-standing problems we usually try non-operative care — activity change, physiotherapy or hand therapy, splinting, and injections — and consider surgery when that has not given enough improvement. For structural or acute problems, surgery may be recommended straight away, without a preceding non-operative trial.

What to expect

Your outlook depends largely on the cause of your symptoms. If you have radial tunnel syndrome, non-surgical management is the first step. Most people find that their symptoms settle with rest and therapy. If your condition is linked to a closed humerus fracture, spontaneous recovery occurs in the majority of patients. Initial non-surgical management is usually recommended because your nerve often heals on its own.

For general radial nerve injuries, spontaneous recovery occurs in 70%–88% of cases. This means that for many, the condition improves without surgery. However, if you have a high radial nerve entrapment neuropathy that does not respond to conservative treatment, surgery may be advised. In these cases, we focus on dissecting the entire length of the fibrous tunnel to relieve pressure. If your symptoms persist despite ongoing care, surgical decompression remains a viable option.

Recovery timelines vary. Injuries to the posterior interosseous nerve typically resolve within 3 months, and at the latest, 5 months after surgery. If you require nerve repair or reconstruction, the radial nerve recovers better if this is done within 5 months of injury. For those with longstanding, irreparable nerve lesions, tendon transfers may be indicated to restore function. These procedures can help you regain efficient grip while awaiting reinnervation of your wrist extensors.

If you experience a radial nerve laceration, successful recovery can be achieved after nerve grafting. Good to excellent motor recovery can be expected in 83% of patients with a large gap of the radial nerve (nine centimeters or greater) when sural nerve autografts are used. We aim to set realistic expectations. While many recover well, some may face prolonged recovery or require reconstructive options. Your surgeon will guide you through the most appropriate path based on your specific injury and response to initial treatment.

When to see someone

Radial tunnel syndrome is a nerve compression issue, not a mechanical joint problem. You may feel pain in the outer elbow or forearm. See your GP if this pain persists or interferes with sleep or work. Nonsurgical management is usually the first step. However, if you have a recent injury, seek specialist review within 3 weeks. Early surgical exploration significantly improves the chance of regaining nerve function. If you experience

sudden weakness in your hand or fingers, go to an emergency department immediately. This could signal acute nerve damage requiring urgent attention. Do not wait for symptoms to resolve on their own if they are severe or worsening rapidly.

In more depth

This section goes further than you need for your own treatment decisions. Radial tunnel syndrome is worth the extra reading for an uncomfortable reason: it is the condition on this site with the weakest evidence base, there is no test that confirms it, and being told plainly how uncertain it is should form part of any decision to operate.

THERE IS NO CONFIRMATORY TEST

Most nerve compressions can be demonstrated. Carpal tunnel syndrome produces slowed conduction across the wrist; cubital tunnel produces it across the elbow. Radial tunnel syndrome characteristically does not — the nerve branch involved supplies muscle rather than skin, so there is no numbness to map, and nerve conduction studies are frequently normal.

The diagnosis therefore rests on the pattern of pain, tenderness a few centimetres distal to the lateral epicondyle rather than over it, and the response to a local anaesthetic block. Each of those is suggestive; none is definitive. Contemporary reviews describe **ongoing controversy regarding both diagnosis and outcomes** [1].

The practical consequence is a high rate of confusion with tennis elbow, which sits immediately adjacent and can coexist. Persistent "tennis elbow" that has not responded to good treatment is one of the commonest circumstances in which radial tunnel syndrome is eventually considered.

THE EVIDENCE FOR TREATING IT IS GENUINELY THIN

A systematic review of interventions found a **tendency that surgical decompression might be effective**, and — the more remarkable finding — that **the effectiveness of conservative treatments is unknown, because for most of them no studies were available at all** [2].

That is not the usual "evidence is limited" formulation. For most non-operative treatments offered for this condition, the studies have not been done. Current reviews still place non-surgical management first, with decompression a viable option for refractory cases [1], and that ordering reflects reasonable caution rather than demonstrated superiority.

WHAT THAT MEANS FOR A DECISION

Two things follow, and they pull in opposite directions.

Against early surgery: the diagnosis cannot be confirmed, so an operation may be decompressing a nerve that is not the source. Where a decompression fails, it is often impossible to determine whether the operation was inadequate or the diagnosis was wrong.

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For considering it in the right patient: there is no evidence base supporting the alternatives either, so waiting is not the evidence-backed option people assume. It is simply the lower-risk one.

The reasonable position is that a confident diagnosis matters more here than anywhere else on this site — a consistent history, examination localising to the radial tunnel rather than the epicondyle, imaging excluding a space-occupying lesion, and ideally a convincing response to a diagnostic block before an irreversible step is taken.

A RELATED BUT DIFFERENT PROBLEM

Posterior interosseous nerve **palsy** — weakness of finger and thumb extension rather than pain — is a distinct entity with clearer management. Where imaging shows no compressive lesion, conservative management should be tried first, with surgery reserved for demonstrated compressive lesions and for failure of conservative treatment [3]. Where there is no space-occupying lesion, a trial of non-operative management is advisable, with exploration recommended if there is **no sign of muscle recovery after 6 weeks** of observation, or if weakness is progressive [4].

Those are concrete thresholds, and their existence is the clearest illustration of the contrast: when the nerve visibly stops working, the literature can say what to do and when. When it only hurts, it cannot.

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