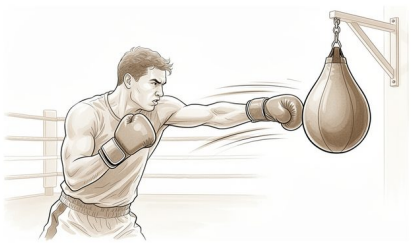
CQ HAND + UPPER LIMB
SPECIALIST ORTHOPAEDIC SURGEON

PATIENT INFORMATION — IN DEPTH

# Metacarpal Fractures (including Boxer's Fracture)



Metacarpal fractures — including the common 'boxer's fracture' of the little-finger knuckle — usually follow a punch or direct blow to the hand.

Kieran Hirpara 

## What you're feeling

A metacarpal fracture is a break in one of the long bones in the body of your hand: the bones that connect your wrist to your fingers, the ones you can feel as your knuckles. The most common one happens after a punch and involves the bone behind the little-finger knuckle. This is so common it has a nickname: a **boxer's fracture**.

Usually there has been an obvious moment: a punch into something solid, a fall onto the hand, or a crush or twisting injury. Straight afterwards the back of the hand becomes painful, swollen and bruised, and the knuckle may look flattened or "sunken" compared with the other side. Making a fist hurts, and your grip feels weak. Some people notice that one finger seems to cross over or point towards its neighbour when they try to curl the hand into a fist; that twist matters, and it's one of the main things we check for.

## What's actually happening

You have five metacarpal bones, one running into each finger and thumb. A fracture can sit at the **neck** (just behind the knuckle, the classic boxer's fracture spot), along the **shaft** (the middle of the bone), or at the **base** (near the wrist). After a break, the broken ends can tip into an angle, shorten, or twist.

A bit of angle is often fine, as the hand is forgiving, and the ring and little finger bones in particular tolerate quite a lot of bend without causing any real problem, because those knuckles are naturally more mobile. What the hand does not tolerate well is twist (we call this rotation). Even a small amount of rotation at the break makes a finger swing across its neighbours when you close your fist, so the fingers no longer pack neatly together. That is why the look of your hand when you make a fist tells us more than an X-ray angle alone.

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## What we can do about it

Dr Kieran Hirpara is an upper-limb surgeon at Mater Private Hospital Rockhampton who guides your care from the first assessment through to recovery. 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, then confirm the diagnosis and choose a plan that fits your needs. For long-standing issues, we usually start with non-operative care and consider surgery only if that has not helped enough.

The good news is that **most metacarpal fractures heal well without surgery.**

For the majority (including most boxer's fractures) the answer is simple support and early movement. Depending on the fracture we might use a lightweight splint, a cast, or just buddy-strapping the injured finger to the one next to it, and then encourage you to start gently moving the hand quite early. Moving early is deliberate: it keeps the hand from stiffening up, and studies show simple strapping with early movement does just as well as heavier casting for typical boxer's fractures.

Surgery is reserved for fractures that won't do well left alone. The main reasons to operate are a **rotated (twisted) finger**, a badly angled or shortened bone, several broken metacarpals at once, a fracture that breaks into a joint, or an open wound over the break. When we do fix it, the options are small wires placed through the skin (K-wires), or a small plate and screws through a cut. Many of these operations can be done wide awake, with the hand numbed by local anaesthetic while you stay awake and comfortable, which lets us ask you to move the finger on the table and confirm the rotation is corrected before we finish.

## What to expect

Most metacarpal fractures unite in around **four to six weeks**, and the hand is back to most normal activities not long after. Even when the bone heals with a little extra bend, the knuckle may look slightly less prominent than before but the hand usually works completely normally.

Whether or not you have surgery, the work that protects your result is the hand movement afterwards: gentle, early, and guided where needed by a hand therapist. The complications we watch for are stiffness (the most common), a residual twist or bend (malunion), and occasionally a slight lag in fully straightening the finger. Stiffness is far easier to prevent with early movement than to treat later, which is why we nudge you to get moving sooner rather than later.

## When to see someone

- **Any deformity, or a finger that crosses over its neighbours when you make a fist**: this twist needs assessing promptly, as it's a key reason to straighten or fix the bone.
- **A wound or break in the skin over the knuckle**, especially after a punch to someone's mouth: a tooth can introduce serious infection, and this needs urgent medical attention.

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- **Severe pain, marked swelling, numbness, or fingers that look pale or dusky**: get reviewed without delay.
- **A hand that is getting stiffer rather than looser** in the weeks after the injury: early hand therapy makes a real difference.

# In more depth

This section goes further than you need for your own treatment decisions. Metacarpal fractures are worth the extra reading because most of them need no operation at all, and because the deformity that worries people most — the knuckle that has flattened — is the one the hand tolerates best.

### WHY ANGULATION IS TOLERATED, AND WHY IT VARIES BY FINGER

A fracture through the neck of a metacarpal typically tips the head downwards into the palm, so the knuckle loses its prominence. That looks wrong and is easy to interpret as needing correction.

What determines whether it matters is how much movement the corresponding joint at the wrist end has in reserve. The index and middle metacarpals are effectively fixed at their bases, so angulation there is poorly compensated. The ring and little metacarpals sit on mobile joints that allow considerable rotation, which absorbs a substantial degree of angulation without functional loss.

That is why a boxer's fracture of the little finger metacarpal — the commonest of all — tolerates far more angulation than the same injury two fingers across, and why a striking-looking deformity there is frequently managed without surgery.

### ROTATION IS THE DEFORMITY THAT DOES MATTER

The exception is rotation, and it is worth understanding because it is easy to miss on an X-ray. A metacarpal healed with a twist causes the finger to cross over its neighbour when the hand closes — scissoring — which genuinely impairs grip and does not accommodate with time.

Rotation is assessed by asking the person to make a fist and looking at whether the fingernails align and the fingers point convergently, not by measuring the film. A fracture with acceptable angles on an X-ray but visible scissoring on examination needs correcting; the reverse often does not.

### WHERE FIXATION IS USED, THE EVIDENCE IS MODEST

For fractures that do need surgery, intramedullary screw fixation — placing a screw down the shaft from the knuckle — has become popular because it avoids a plate under the extensor tendons. Reviewing **1,014** patients, **complications following intramedullary screw fixation of metacarpal fractures are relatively uncommon** [1].

The comparative evidence is weaker than the popularity suggests. An earlier review of **502** patients concluded intramedullary fixation **may have a role** in the treatment of certain metacarpal fractures, but that **no conclusive recommendations could be made** from the available studies [2].

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Both statements can be true: the technique is safe, and it has not been demonstrated superior. Given that the majority of these fractures do well without surgery, the more consequential decision remains whether to operate rather than which implant to use.

## MALUNION IS CORRECTABLE, WHICH CHANGES THE CALCULUS

Where a fracture heals in a poor position and causes a genuine functional problem, corrective osteotomy is available. **Corrective osteotomies almost always heal without incident**, with a majority of patients showing improvement or correction of deformity and improved finger motion — though the review notes that many patients, despite improvement, retain some limitation [3].

This is a reasonable argument for non-operative management in borderline cases. The alternative to operating now is not "accept whatever happens" — it is "operate later, in the smaller number of people who turn out to need it", with a procedure that reliably heals.

## REFERENCES


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2. Corkum JP, Davison PG, Lalonde DH. Systematic review of the best evidence in intramedullary fixation for metacarpal fractures. Hand (N Y). 2013;8(3):253-60.
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