CQ HAND + UPPER LIMB
SPECIALIST ORTHOPAEDIC SURGEON

EVIDENCE SUMMARY

Braces, Splints and Supports

Overview

- Sling immobilization is not inferior to brace immobilization after arthroscopic rotator cuff repair [1].
- The conclusion that sling immobilization is not inferior to brace immobilization after arthroscopic rotator cuff repair cannot be attributed solely to the type of immobilization [1].
- Removable splints for minimally displaced distal radial fractures save patients time and inconvenience by reducing additional hospital visits [2].
- Removable splints for minimally displaced distal radial fractures save the healthcare system money [2].
- The Cross Brace Protocol provides a non-operative option for ACL injuries [3].
- The Cross Brace Protocol may be associated with satisfactory anatomical and functional healing for certain patient groups with ACL injuries [3].
- Proximal interphalangeal joint orthosis and therapeutic exercise demonstrate feasibility and short-term clinical improvement in trigger finger management [4].
- Proximal interphalangeal joint orthosis and therapeutic exercise cannot establish superiority over other conservative treatments for trigger finger due to the absence of a control group [4].
- Splinting is an effective short-term conservative treatment for adult trigger finger [6].
- Splinting offers symptom relief and functional improvement comparable to corticosteroid injections for adult trigger finger [6].
- Supportive bandage, removable splint, and walking casts are all well tolerated with similar complication rates for low-risk ankle fractures in children [7].
- There remains equipoise regarding the best treatment among supportive bandage, removable splint, and walking casts for low-risk ankle fractures in children [7].
- Four weeks of cast immobilization is sufficient for most distal radial fractures in adequately reduced elderly patients [5].
- Orthoses offer a good alternative to plaster casts for stable distal radius fracture types [8].
- Pooling of studies on waterproof casts for upper limb fractures in children was limited by heterogeneity and small study sizes [11].

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Dr Kieran Hirpara — Specialist Orthopaedic Surgeon
Suite 2, Level 1, Mater Private Hospital Rockhampton, 31 Ward Street, The Range, QLD 4700
Phone 07 4863 6556 · office@cqupperlimb.com.au · cqupperlimb.com.au

- Definitive RCTs are required to confirm the efficacy and investigate the cost-effectiveness of waterproof casts for upper limb fractures in children [11].
- Adult patients with a scaphoid waist fracture displaced by ≤ 2 mm should be treated initially with immobilization in a cast [14].
- Early fixation of nonunion is recommended for adult patients with a scaphoid waist fracture initially treated with cast immobilization [14].

How It Works

- Sling immobilization after arthroscopic rotator cuff repair is not inferior to brace immobilization [1].
- Removable splints for minimally displaced distal radial fractures save patients time and inconvenience by reducing hospital visits [2].
- Splinting is an effective short-term conservative treatment for trigger finger [6].
- Splinting offers symptom relief and functional improvement comparable to corticosteroid injections for trigger finger [6].
- Supportive bandages, removable splints, and walking casts for low-risk ankle fractures in children are all well tolerated with similar complication rates [7].
- There remains equipoise regarding the best treatment among supportive bandages, removable splints, and walking casts for low-risk ankle fractures in children [7].
- Pain and functional outcomes after primary reverse total shoulder arthroplasty are comparable between no immobilization and a 3-week immobilization period [9].
- Scaphoid waist fracture union consolidated in patients with > 20% bridging without intervention between one and five years after randomization [10].
- Maintaining an appropriate balance between mobilization and immobilization has a decisive impact on tissue healing, functional recovery, and patient outcomes in hand rehabilitation [12].
- Relative motion orthoses and metacarpophalangeal joint blocking orthoses support interchangeable use for managing trigger finger based on symptom severity, pain, hand function, and wearability outcomes [13].
- Mid-frequency electrical muscle stimulation (MFEMS) during immobilization after arthroscopic rotator cuff repair effectively prevents early post-operative deltoid muscle atrophy [16].
- Mid-frequency electrical muscle stimulation (MFEMS) during immobilization after arthroscopic rotator cuff repair accelerates early recovery of shoulder muscle strength [16].
- Four weeks of cast immobilization is sufficient for most distal radial fractures in elderly patients [5].

What the Evidence Shows

IMMOBILIZATION AND BRACING STRATEGIES

- Sling immobilization after arthroscopic rotator cuff repair is not inferior to brace immobilization, although this conclusion cannot be attributed solely to the type of immobilization [1].
- Removable splints offer a safe treatment option for minimally displaced distal radial fractures, reducing hospital visits and healthcare costs compared to plaster casts [2].
- A 4-week cast immobilization period is sufficient for most distal radial fractures in elderly patients [5].
- Orthoses provide a good alternative to plaster casts for stable distal radial fracture types [8].
- Waterproof casts are an option for upper limb fractures in children, but definitive RCTs are required to confirm efficacy and investigate cost-effectiveness due to study heterogeneity and small sample sizes [11].
- Three-week immobilization after primary reverse total shoulder arthroplasty yields pain and functional outcomes comparable to longer immobilization periods [9].
- Maintaining an appropriate balance between mobilization and immobilization is a central challenge in hand rehabilitation that decisively impacts tissue healing, functional recovery, and patient outcomes [12].

SPECIFIC ORTHOTIC PROTOCOLS AND DEVICES

- The Cross Brace Protocol provides a non-operative option for ACL injuries, potentially associated with satisfactory anatomical and functional healing for certain patient groups [3].
- Proximal interphalangeal joint orthosis combined with therapeutic exercise demonstrates feasibility and short-term clinical improvement for trigger finger, though superiority over other conservative treatments cannot be established due to the absence of a control group [4].
- Splinting is an effective short-term conservative treatment for trigger finger, offering symptom relief and functional improvement comparable to corticosteroid injections [6].
- Relative motion orthoses and metacarpophalangeal joint blocking orthoses are interchangeable for managing trigger finger based on symptom severity, pain, hand function, and wearability outcomes [13].
- Supportive bandages, removable splints, and walking casts for low-risk ankle fractures in children are all well-tolerated with similar complication rates, leaving equipoise regarding the best treatment [7].

SURGICAL FIXATION AND INTERNAL BRACING

- UCL repair with internal brace reports excellent midterm patient-reported outcomes statistically similar to UCL reconstruction, including similar proportions of athletes successfully returning to preinjury sport [19].
- The embrace technique for syndesmotic injury yields equivalent outcomes compared with suture button fixation [20].
- For adult scaphoid waist fractures displaced by $\leq$ 2 mm, initial treatment with cast immobilization followed by early fixation of nonunion is recommended [14].
- Between one and five years after randomization, scaphoid union consolidated in patients with > 20% bridging without intervention [10].

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ADJUNCTIVE THERAPIES

- Adding thoracic extension exercises or thoracic kinesio taping to shoulder exercises results in significant improvements in activity-related pain and self-reported disability for adults with subacromial pain syndrome, exceeding previously reported MCID values [21].

Practical Considerations

- There remains equipoise regarding the best treatment for low-risk ankle fractures in children among supportive bandages, removable splints, and walking casts [7].
- Supportive bandages, removable splints, and walking casts for low-risk ankle fractures in children are well tolerated with similar complication rates [7].
- Pain and functional outcomes after primary reverse total shoulder arthroplasty are comparable between three-week immobilization and no immobilization [9].
- Between one and five years after randomization, scaphoid waist fracture union consolidated in patients with > 20% bridging without intervention [10].
- Definitive randomized controlled trials are required to confirm the efficacy of waterproof casts for upper limb fractures in children [11].
- Definitive randomized controlled trials are required to investigate the cost-effectiveness of waterproof casts for upper limb fractures in children [11].
- Limitations in the current state of 3D-printed orthoses include small sample sizes [15].
- Limitations in the current state of 3D-printed orthoses include a lack of standardized assessment methods [15].
- Limitations in the current state of 3D-printed orthoses include durability concerns [15].
- Further research is required to address limitations in the current state of 3D-printed orthoses [15].
- Initial cast immobilization with fixation for nonunion is the optimal treatment for adults with scaphoid waist fractures [17].
- Small quality-adjusted life year gains for initial surgical fixation of scaphoid waist fractures were not sufficient to justify the higher costs compared to initial cast immobilization [17].
- Use of a codesigned patient decision aid in practice for total knee arthroplasty decisions was feasible [18].

Key Evidence

- [L5] They argue that the conclusion that sling immobilization is ‘not inferior’ to brace immobilization cannot be attributed solely to the type of immobilization. [1] (10.1002/arj.70326)
- [L2] If patients can be treated safely using a removable splint, this will save them time and inconvenience in terms of additional visits to the hospital, and save the healthcare system money. [2] (10.1302/0301-620x.107b1.bjj-2024-0634.r1)

- [L2] The Cross Brace Protocol provides an additional non-operative option for ACL injuries and may be associated with satisfactory anatomical and functional healing for certain patient groups. [3] (10.1177/2325967126s00013)
- [L4] Because of the absence of a control group, these findings demonstrate feasibility and short-term clinical improvement but cannot establish superiority over other conservative treatments. [4] (10.1016/j.jhsg.2026.101038)
- [L5] The authors should be commended for a well-designed, well-executed randomized controlled trial that makes a compelling case that 4 weeks of cast immobilization is sufficient for most distal radial fractures in elderly patients. [5] (10.2106/jbjs.25.00333)
- [L2] Splinting is an effective short-term conservative treatment for trigger finger, offering symptom relief and functional improvement comparable to corticosteroid injections. [6] (10.1016/j.jhsg.2025.100881)
- [L2] There remains equipoise regarding the best treatment of these injuries, with all three treatments appearing well tolerated with similar complication rates. [7] (10.1302/0301-620x.107b1.bjj-2024-0354.r1)
- [L1] Hence, orthoses offer a good alternative to plaster casts, especially for stable fracture types. [8] (10.1186/s12891-026-09585-4)
- [L1] The pain and functional outcomes are comparable to those obtained with a 3-week immobilization period. [9] (10.1016/j.jse.2025.02.015)
- [L1] Between one and five years after randomization, union consolidated in those with > 20% bridging without intervention. [10] (10.1302/0301-620x.108b1.bjj-2025-0125.r1)
- [L1] However, pooling of studies was limited by heterogeneity and small study sizes, and definitive RCTs are required to confirm efficacy and investigate cost-effectiveness. [11] (10.1302/0301-620x.107b6.bjj-2025-0011)
- [L5] The review highlights that maintaining an appropriate balance between mobilization and immobilization is a central challenge in hand rehabilitation and has a decisive impact on tissue healing, functional recovery and patient outcomes. [12] (10.1177/17531934251413908)
- [L1] Symptom severity, pain, hand function, and orthosis wearability outcomes support interchangeable use of relative motion and metacarpophalangeal joint blocking orthoses for managing trigger finger. [13] (10.1016/j.jht.2025.05.018)
- [L1] The recommendation that adult patients with a fracture of the waist of the scaphoid which is displaced by ≤ 2 mm should be treated initially with immobilization in a cast, followed by early fixation of a nonunion, is further corroborated by these findings. [14] (10.1302/0301-620x.108b1.bjj-2025-0122.r1)
- [L1] However, limitations such as small sample sizes, lack of standardized assessment methods, and durability concerns must be addressed through further research. [15] (10.1186/s12891-025-09070-4)
- [L3] The application of the MFEMS during immobilization period after ARCR effectively prevented early post-operative deltoid muscle atrophy and accelerated early recovery of shoulder muscle strength. [16] (10.1002/ksa.70303)

- [L1] Initial cast immobilization with fixation for nonunion is the optimal form of treatment for adults with a scaphoid waist fracture, as the small quality-adjusted life year gains for those who underwent surgery initially were not sufficient to justify the higher costs. [17] (10.1302/0301-620x.108b1.bjj-2025-0116.r1)
- [L1] Use of the aid in practice was feasible. [18] (10.1016/j.arth.2025.05.104)
- [L3] Athletes who underwent UCL repair with internal brace reported excellent midterm PROs statistically similar to those after UCL reconstruction, including proportion successfully returning to preinjury sport. [19] (10.1177/03635465251314054)
- [L3] The embrace technique yielded equivalent outcomes compared with suture button fixation for managing syndesmotic injuries. [20] (10.1186/s13018-025-06620-3)
- [L1] All interventions resulted in significant improvements across several outcomes, with improvements in activity-related pain and self-reported disability exceeding previously reported MCID values. [21] (10.1016/j.jse.2026.02.001)

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