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AO Surgery Reference: a comprehensive guide for management of fractures

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CATEGORY Injury, fractures.

PLATFORM

iOS (7.1 or later) and Android (2.1 or later).

COST Free.

ABOUT THE APP

AO Surgery Reference (AOSR) is produced by the AO (Arbeitsgemeinschaft für Osteosynthesefragen) Foundation, which is an international organisation founded in Davos, Switzerland, that focuses on research and education regarding the management of orthopaedic injuries.

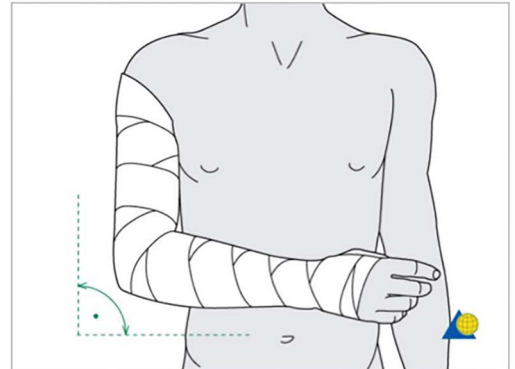
The app focuses on providing an overview of the management and follow-up protocols of fractures once they have been radiologically diagnosed, while also providing an overview of interim management strategies and potential complications following site-specific trauma. The interface allows the user to navigate by selecting the relevant body area, then selecting a diagnosis, based on the AO/Orthopaedic Trauma Association (OTA) classification of fractures¹ with a pictorial depiction of the fracture pattern. The app allows the user to select for non-operative or operative management, also providing information about indications for each.

The app allows for selection of a non-operative or operative management plan, the latter being subdivided into the particular types of fracture fixation (external fixation, plate, intramedullary nail, closed reduction internal fixation, etc). Once a management plan has been selected, the app describes correct patient positioning, aides to reduction and other information regarding use of intraoperative imaging. The section 'Reduction and Fixation' provides extensive information regarding basic anatomy and biomechanical principles for a given fracture type. It outlines fracture reduction techniques, as well as information regarding cast application, padding, sling use and postreduction management. This is via easy to follow pictorial guides as well as videos embedded into the app. The 'Aftercare' section provides practical information regarding activities of daily living (eg, sleeping, hygiene), rehabilitation, wound care, patient follow-up and weight-bearing recommendations.

The 'Appendix' section provides further reading through literature summaries (with a referenced bibliography) and up-to-date protocols on various topics including thromboembolic prophylaxis, open fracture management and management of complications such as compartment syndrome or infection. These entries provide a succinct overview of relevant issues related to orthopaedic trauma.



Apply cast padding



With the patient sitting, if possible, cast padding should be wrapped around the upper arm, elbow, forearm and hand, down as far as the transverse crease of the hand (leave the MP joints free). Keeps the elbow in 90° flexion and the forearm in neutral rotation. Make sure that the epicondyles of the humerus and the antecubital area are well padded.

Figure 1 Screenshot of AOSR app—general considerations of casting techniques.

IS IT USEFUL FOR CLINICAL PRACTICE?

Fractures are an inevitable part of sporting participation, with a recent work showing that a male professional football team can expect 1–2 fractures per season.² It is important for sports physicians and physiotherapists to be aware of the initial first-aid for suspected fractures and also to have a working understanding of operative and non-operative management strategies for fractures.

The app provides a concise evidence-based summary of the various management methods for different fracture patterns, and more importantly provides a guide on management and follow-up strategies during rehabilitation.

The app provides useful detailed management information for each fracture configuration and return to play guidelines. It also provides useful education regarding interim first-aid measures for fractures and highlights potential complications for various fracture types—such as compartment syndrome, early osteoarthritis or avascular necrosis. Furthermore, in many countries globally, sports physicians act as surgical assistants in theatre and therefore this app would provide direction on patient

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Mobile App User Guides

position, equipment and techniques for various surgical approaches and fixation techniques.

PROS

- ▶ Free
- ▶ Intuitive design with vast array of informative images
- ▶ Quick guide to operative and non-operative management of fractures
- ▶ Guidelines for rehabilitation and explanation of principles of treatment
- ▶ Evidence-based literature summaries
- ▶ Logical order of app taking user through diagnosis, to management decisions, treatment, rehabilitation and aftercare considerations
- ▶ The AO fracture classification system is a standardised and accepted classification system with international recognition, and provides a useful tool in communication between health professionals
- ▶ The app provides further information to health professionals to be wary of certain fractures that could put the patient at risk of further complications (such as compartment syndrome in patients with tibial fractures)

CONS

- ▶ Lack of further information regarding soft tissue injury, especially ligamentous injury
- ▶ Recent bug fixes have made the application more user-friendly, however, the operating system is still quite slow
- ▶ Needs internet access to be used

Twitter Follow Liam West at @Liam_West

Contributors LRW, MN and RB all contributed to the initial drafts of the manuscript. LRW then finalised and submitted it.

Competing interests RB is an AO faculty member.

Provenance and peer review Not commissioned; externally peer reviewed.

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- 2 Larsson D, Ekstrand J, Karlsson MK. Fracture epidemiology in male elite football players from 2001 to 2013: 'How long will this fracture keep me out?' *Br J Sports Med* 2016;50:759–63.



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