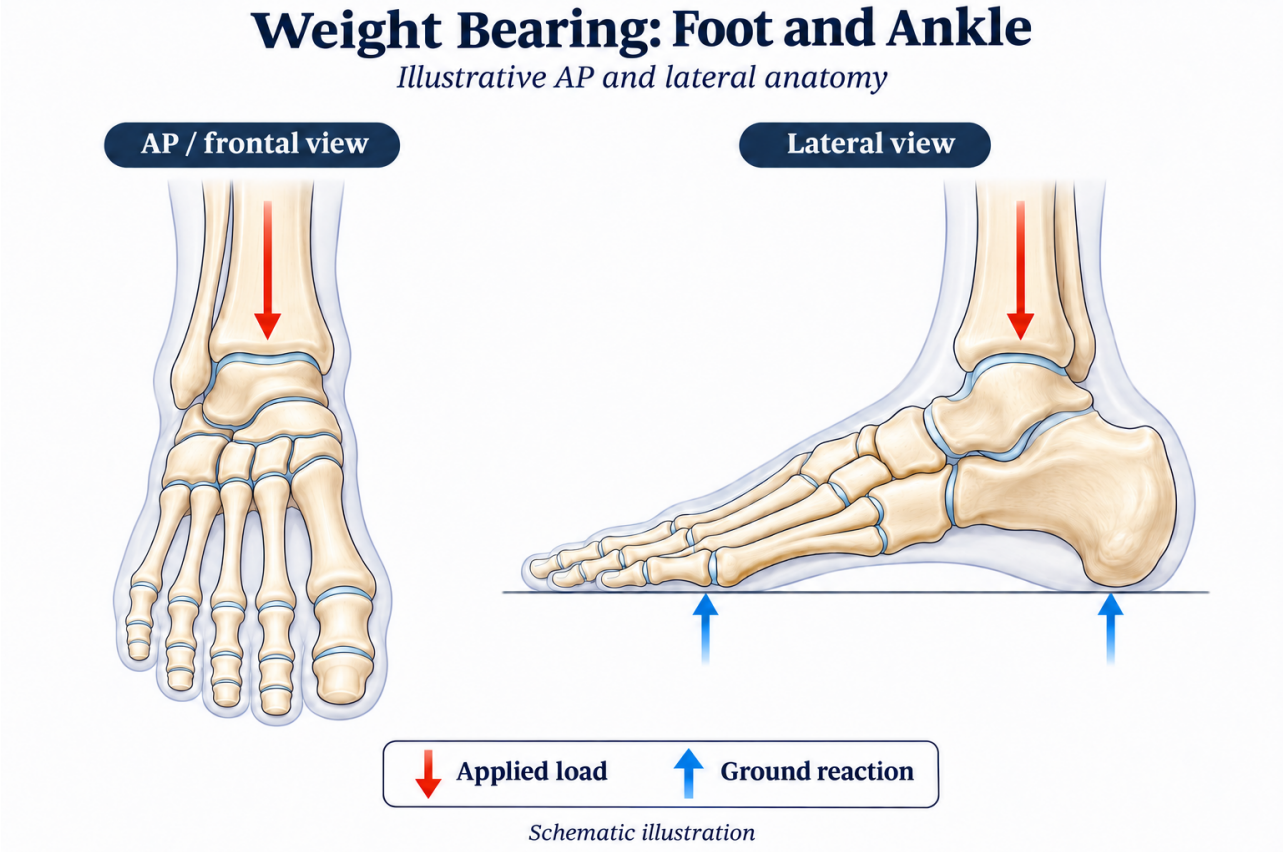
ILLUSTRATED CLINICAL MONOGRAPH

Immediate Weight Bearing After Foot and Ankle Surgery

Stable fixation, protected loading and individualised rehabilitation

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First illustrated edition
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PURPOSE AND SCOPE

About this edition

This book presents the author's clinical philosophy alongside a targeted account of selected evidence. It explores immediate and early loading after foot and ankle surgery while retaining procedure-specific protection, wound care and individual clinical judgement.

How to use the book

The first chapters explain the reasoning and terminology. The procedure chapters identify what has been studied and where a proposed approach extends beyond direct comparative evidence. The final chapters and appendices support discussion, documentation and future audit. Study results are described with their actual loading times rather than grouped under a single early-loading label.

Clinical scope

The book addresses adult orthopaedic practice. Some cited studies enrolled skeletally mature adolescents; their eligibility should be checked before applying them to a different population. This is not a paediatric, diabetic-foot or Charcot reconstruction protocol. High-risk and revision cases require their own specialist assessment.

Source and illustration credits

Clinical philosophy and original sketch: Mr Peyman Bakhshayesh. The completed anatomical cartoon was developed from the supplied sketch using AI-assisted illustration and revised following the author's correction of the cuboid articulation. It is a teaching schematic, not a radiographic atlas or a mechanical validation study.

The supplied working review and spreadsheet informed the evidence questions. Their original research-team contribution is acknowledged in Appendix C. AI-assisted drafting, literature organisation and document preparation were used in developing this edition. The book is not presented as externally peer reviewed or endorsed by the institutions or professional bodies cited.

Edition information

First illustrated edition, 12 November 2026. Selected sources checked on that date. No new patient dataset or prospective trial is reported. Implant names identify the evidence or design discussed and do not imply a commercial endorsement.

© 2026 Mr Peyman Bakhshayesh. Written clinical instructions issued by the treating team take precedence for an individual patient. Bibliographic links allow readers to examine the original evidence and guidance.

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THE AUTHOR'S APPROACH

Preface

The purpose of this book is to explain why I favour dependable fixation and the earliest appropriate return to weight bearing after foot and ankle surgery. I want the reconstruction to support recovery in the patient's daily life: getting out of bed, reaching the bathroom, managing the home and regaining confidence. A technically satisfactory operation should be accompanied by a practical plan for movement.

My preference is to preserve or restore the shape of the foot and ankle, prepare fusion surfaces carefully, obtain stable fixation and use protective footwear or other biomechanical support when needed. In a suitable patient this may permit immediate protected weight bearing. In another patient, a wound, weak bone, an associated reconstruction or uncertainty about stability may require a different timetable. The decision must account for both the consequences of loading and the consequences of prolonged offloading.

This book develops that approach as a clinical narrative. It distinguishes my operative preferences and proposed decision framework from the findings of published studies. It includes the original teaching sketch and the completed AP and lateral cartoon, with the fourth and fifth metatarsal bases shown articulating with one cuboid in the lateral illustration. The drawings help explain relationships; they do not demonstrate an implant's load capacity.

The supplied working review and study spreadsheet informed the preparation of this edition. Their eight listed studies concern ankle-fracture fixation. The book therefore considers that evidence separately and adds selected primary literature and official guidance relevant to elective surgery. It does not reproduce the working review's pooled analyses or claim to be a newly completed systematic review.

The intended readers are foot and ankle surgeons, trainees, physiotherapists and other members of the rehabilitation team. Patients may also use the explanations to prepare questions for their clinician. Permission to load a particular operated foot comes from the treating team and the written postoperative plan, not from the title of this book.

CHAPTER 01

1 A surgical philosophy that includes rehabilitation

The purpose of early loading

My preferred approach is to achieve dependable fixation, restore or preserve useful alignment, and allow patients to bear weight immediately or as soon as the whole reconstruction permits. This preference begins with the person who must live through recovery. A technically satisfactory operation is only one part of treatment. The patient must also transfer, reach the bathroom, manage at home and regain confidence in walking. I regard the rehabilitation plan as part of the operation itself. The aim is useful, safe mobility while healing proceeds, with restrictions that have a clear purpose and a defined opportunity for review.

This is a clinical philosophy, rather than a claim that every foot and ankle operation has been proved suitable for immediate unrestricted walking. The word immediate describes when loading starts; it does not describe how much walking is sensible, where pressure may be applied or whether a protective device is needed. A short transfer in a prescribed boot, heel-protected walking after forefoot surgery and normal walking with forefoot push-off are different activities. Throughout this book, I favour the earliest appropriate opportunity to mobilise, while keeping those distinctions visible to the patient and the treating team.

Modern fixation and the reasons for protection

Improvements in fixation have strengthened the case for reassessing traditional periods of unloading. Plates, compression screws and other stabilising constructs offer options that differ from those available to earlier generations of surgeons. However, prolonged protection cannot be explained solely by the limitations of older metalwork. Surgeons have also sought to protect wounds, preserve correction and allow bone or soft tissues to heal. A modern implant changes part of that calculation. It does not remove the need to assess bone quality, the biological environment, the extent of reconstruction or the patient's ability to use the agreed protection.

In ankle fusion, my preference includes preserving useful bony support and the shape of the ankle where the chosen operation allows it, together with dependable fixation. Similar reasoning informs my interest in stable subtalar, talonavicular and midfoot constructs. These are principles behind my approach, not evidence that one arrangement of plates or screws guarantees union or permits the same rehabilitation in every patient. The question is whether the completed reconstruction can tolerate the intended activity while healing progresses. Answering it requires attention to the weakest relevant part of the reconstruction, including the wound and any associated tendon or ligament procedure.

A preference that remains accountable

A preference for early loading should lead to more explicit reasoning, rather than less. I want the record to show why loading is appropriate, what protection it requires and what finding would change the plan. If restriction is necessary, its purpose should be equally clear. Different surgeons may reasonably reach different decisions when their constructs, patients or interpretation of evidence differ. BOFAS describes initial unloading in example ankle and triple-fusion pathways, illustrating continuing variation in practice. [17] My proposed approach is to examine each restriction against the particular reconstruction and patient, and to revisit it as new clinical information becomes available.

CHAPTER 02

2 Defining the loading prescription

Start time and permitted activity are separate

For clarity, this book uses immediate loading to mean permission to begin on the day of surgery or the first postoperative day, once the patient is medically ready and the treating team has authorised it. When a paper uses a different definition, its actual timing is given. Early loading is a relative term: it can mean the first few days, two weeks or three weeks. A study comparing two and six weeks does not answer the same question as a study starting on postoperative day one.

The date alone is an incomplete description. Two people may both be told that they can bear weight immediately, yet one may walk only for essential transfers in a prescribed boot and the other may have no weight-bearing restriction. A further patient may be allowed heel contact in a forefoot-relief shoe, with forefoot push-off restricted. Those are different exposures for the reconstruction and different practical experiences for the patient.

A shared vocabulary

The British Orthopaedic Association recommends three terms for a new prescription: Non Weightbearing, Limited Weightbearing and Unrestricted Weightbearing. A restriction should have a reason, a defined duration and a description in practical activities or walking distances, rather than percentages of body weight. Required aids and braces belong in the same plan. Historical papers may use other terms; those terms describe the study and should not be mistaken for a complete contemporary prescription. [1]

Unrestricted weight bearing describes the permitted load through the limb. It does not automatically authorise sport, unrestricted ankle movement, driving, removal of a boot or ordinary footwear. Conversely, permission to move a joint is not permission to stand on it. These distinctions matter particularly after tendon reconstruction and ankle replacement, where movement and loading may follow separate instructions.

Reading the anatomy illustration

The left panel combines a frontal ankle schematic with a dorsoplantar presentation of the foot to make the bones readable. It is not a single standard radiographic projection. The lateral panel illustrates the relationship of the talus, calcaneus and midfoot, with the lateral metatarsals meeting the cuboid. Red and blue arrows indicate applied loading and ground reaction conceptually; their lengths and positions are not measured force vectors or a calculation of joint contact stress.

The original drawing expresses the clinical question behind this book: how can force pass through a reconstruction while healing proceeds? The illustration cannot answer that question for an individual operation. Alignment, the fixation construct, bone contact, soft tissues and the patient's manner of walking must be assessed together.

Loading terms at a glance

Description	Meaning in this book	What must still be specified
Immediate	Loading starts on day 0 or day 1 unless a study says otherwise.	Device, permitted tasks, assistance and review.
Early	Loading starts earlier than the comparison protocol.	The actual postoperative day or week.
Protected	A prescribed shoe, cast or orthosis modifies the activity or loading environment.	Whether the device is needed for every step and which movements remain restricted.
Heel loading	A regional restriction intended to reduce forefoot demand.	Footwear, walking technique and whether push-off is prohibited.
Weight bearing as tolerated	A term used in many studies to describe symptom-guided loading.	It does not by itself define footwear, activity or safety in an insensate foot.
Joint mobilisation	Movement of a joint, actively or with assistance.	Whether standing and walking are also allowed.
Union or integration	A biological healing outcome assessed over time.	Clinical and imaging evidence; it is not established simply by allowing walking.

Definitions describe the intervention. They are not permission to change an individual prescription. Contemporary UK prescriptions should use the agreed loading category and practical instructions. [1]

CHAPTER 03

3 Loading mechanics and the biology of healing

Standing is different from push off

The illustrations in this book show the foot and ankle as a connected structure through which forces are transmitted. They are schematic explanations, not measurements of the force across a particular fusion or implant. During walking, the distribution of load changes with foot position, muscle activity and the stage of the step. Permission to place the foot on the ground therefore cannot be translated automatically into permission for every walking activity. A rehabilitation instruction should make clear whether it concerns supported standing, short transfers, protected walking or a return towards normal gait, because each asks something different of the reconstruction.

Forefoot push-off deserves particular attention after forefoot and midfoot procedures. A patient may be permitted to walk using a prescribed shoe that protects the operated region while still being asked to avoid a normal rolling step through the toes. Heel-protected walking is therefore a meaningful restriction, even when the patient can support body weight through the heel. The same distinction explains why a wire maintaining toe alignment is not, by itself, permission for unrestricted push-off. These examples describe the reasoning behind protection; the operating team must specify which pattern of loading is appropriate for the actual procedure.

Mechanical stability and biological healing

Fixation provides an initial mechanical environment in which healing can occur. It does not create immediate biological union. The surgeon's assessment brings together stability, alignment, bone contact, the quality of the tissues and the expected demands of rehabilitation. For a fusion, a strong construct cannot substitute for the biological work required to achieve union. Equally, an attractive radiograph of well-positioned metalwork cannot reveal every factor affecting healing. My preference for solid fixation should therefore be understood as one part of a broader strategy, alongside preparation, attention to the biological environment and an appropriate plan for protection and follow-up.

The same separation between initial stability and later biological fixation is relevant to ankle replacement. Bone-facing surfaces of some implants are porous and may incorporate hydroxyapatite or other design features intended to support integration. [11][19] They do not become fully integrated at the moment the operation ends. The polyethylene bearing and the surfaces intended for bone attachment also perform different functions. In discussing loading after replacement, I therefore separate the implant's design from the patient's permission to walk. The selected prosthesis, initial fixation, bone quality, wound and any additional reconstruction all remain relevant to the rehabilitation decision.

Assessing the complete reconstruction

A combined procedure should not inherit its loading plan from whichever component appears most robust. A patient may have a stable osteotomy together with a tendon transfer, several fusion sites, an extended exposure or a correction that changes pressure on vulnerable skin. My proposed framework asks which component limits the intended activity and whether a brace, walking aid or change in walking pattern can address that limit. This avoids treating the operation's name as a complete prescription. It also explains why two patients with apparently similar plate fixation can appropriately receive different instructions without either plan being internally inconsistent.

The foot and ankle under load

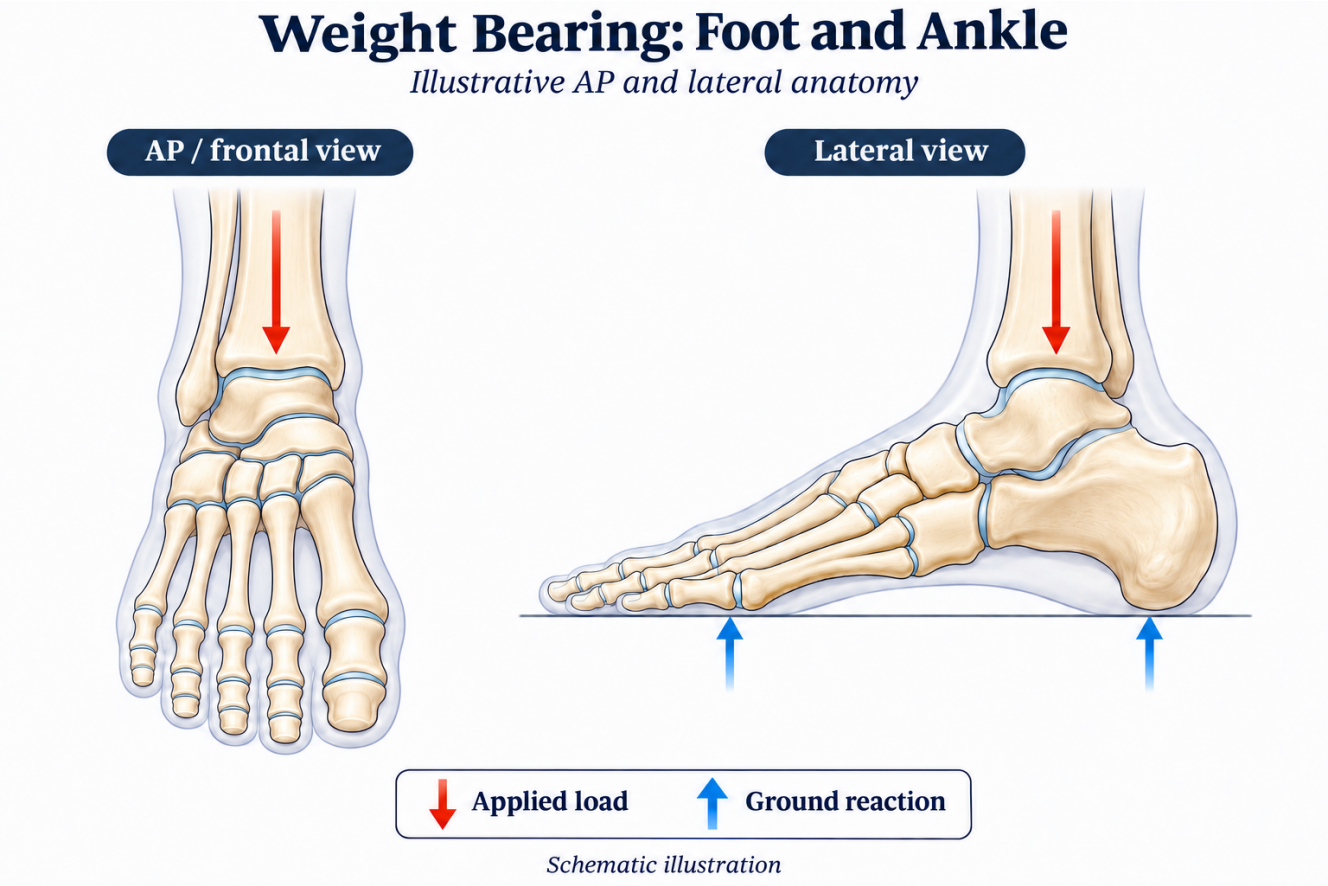


Figure 1. Completed teaching cartoon based on the author's drawing. The frontal ankle and dorsoplantar foot are combined for clarity; the lateral view shows the fourth and fifth metatarsals meeting a single cuboid. The arrows are qualitative. The image does not show fixation, soft-tissue tension, muscle forces or measured joint loads.

A change in the distribution of load

Standing, heel-protected walking and normal forefoot push-off are mechanically different activities. A prescribed device and walking technique may allow useful mobility while reducing demand on a particular region. The clinical question is whether that specific activity is appropriate for the complete reconstruction, not simply whether the foot can touch the floor.

CHAPTER 04

4 Assessing the person and the soft tissues

The practical cost of unloading

The consequences of unloading deserve the same attention as the consequences of loading. A patient may have difficulty using crutches because of upper-limb pain, poor balance, reduced strength or disease in the opposite leg. Stairs, narrow rooms, limited support at home and the need to care for another person can make a theoretically simple instruction difficult to carry out. My proposed assessment considers these circumstances before discharge and, where possible, before surgery. Their presence does not automatically justify loading a vulnerable reconstruction, but it may change the choice of walking aid, protective device, support arrangements or rehabilitation setting.

Avoiding falls and preserving independence are important aims of my approach. They should be described as aims to assess, not guaranteed benefits of an early-loading prescription. Permission to bear weight can make transfers easier for some people, while pain, sedation, unfamiliar footwear or poor balance can still make walking hazardous. A patient who has been instructed to remain unloaded may also place weight through the limb unintentionally. Observing how the person actually moves is therefore more informative than assuming that a written instruction will be followed exactly. The plan should address foreseeable difficulty without blaming the patient for physical limitations.

Wound condition and biological vulnerability

The soft tissues can determine the pace of rehabilitation even when the fixation appears dependable. Swelling, skin quality, the position of an incision and the effect of a boot or dressing require consideration alongside the bone reconstruction. A closed wound is an important clinical milestone, but it is not the only question: the team must also assess whether the proposed activity and device are compatible with ongoing healing. In my framework, a wound problem can justify altering an otherwise reasonable loading plan. Protecting the soft tissues is part of achieving early recovery, rather than a separate concern competing with it.

Patient selection also requires attention to protective sensation, circulation, diabetes, smoking, nutritional concerns and the biological demands of revision surgery or prior infection. These factors do not operate as a single score that automatically produces a loading date. They prompt a more careful assessment of what can be protected, what can be improved and what must be monitored. In particular, absence of pain should not be treated as reassurance when protective sensation is impaired. A patient with neuropathy may require a different strategy from one who can reliably recognise discomfort and respond to changes in the foot.

Mobilisation and thrombosis are separate decisions

Early mobilisation does not remove the need for venous thromboembolism assessment. NICE advises considering prophylaxis in relevant foot and ankle operations according to immobilisation, anaesthetic duration and the balance between thrombosis and bleeding risk. [2] An Achilles-repair randomised trial found no significant reduction in detected DVT with early functional mobilisation. [16] For this book, the implication is to keep permission to walk separate from the assessment of thrombosis prevention. My wish to support movement and circulation is a clinical aim, not a promise that a loading regimen will prevent DVT, infection or another complication in an individual patient.

CHAPTER 05

5 Ankle fracture fixation

Why fracture evidence matters

Ankle fracture fixation provides an important reference point for this book because rehabilitation timing has been tested in substantial randomised trials. The practical question is familiar: after the surgeon has restored alignment and obtained satisfactory fixation, how much additional protection does prolonged unloading provide, and what does it cost the patient in mobility and independence? The answer must relate to the injury, construct and rehabilitation actually studied.

Fracture fixation also illustrates the distinction between permitting loading and prescribing ordinary walking. A patient may begin supported walking in a boot while still protecting the incision, limiting distance and using aids. In this framework, the first aim is a manageable, clearly explained mobilisation plan. Permission to load does not imply that swelling, pain, endurance or balance have already recovered.

Evidence

The WAX trial randomised 561 patients after surgery for unstable ankle fractures to loading at two weeks or six weeks. The earlier strategy met the trial's non-inferiority criterion for function, with no statistically detected difference in the overall complication comparison. Patients without protective ankle sensation and those treated with hindfoot nails were excluded. WAX supports two-week loading in the population studied; it did not test loading from the day of surgery. [3]

The INWN trial studied a different question. Among 160 participants, protected loading from postoperative day one in a walking boot was compared with six weeks of unloading in a cast. Early functional results favoured the immediate group, and reported complication rates were similar. Tibial plafond fractures were excluded. Because the device and loading regimen changed together, the findings describe the rehabilitation package rather than the isolated effect of loading timing. [4]

Applying the findings

These trials give a sound reason to reconsider routine prolonged unloading after suitable ankle fracture fixation. They should not be used as a substitute for assessing the reduction, fixation, wound and patient. A written plan should identify the protective device, walking aids, permitted activities and review arrangements, so the patient and rehabilitation team understand what early loading means in that particular case.

The lessons also have limits elsewhere in the foot. An elective fusion must develop a new bony union across a prepared joint, a replacement depends on the implant and its interface with bone, and a tendon procedure must protect healing soft tissue. The fracture trials support careful investigation of earlier mobilisation across surgery; they do not establish one loading timetable for every reconstruction.

CHAPTER 06

6 Ankle fusion

My operative preference

My preference is to prepare the ankle thoroughly, obtain solid fixation and preserve the useful shape and support of the ankle wherever possible. I value the fibula laterally and the medial malleolus medially as part of that architecture. Where appropriate to the reconstruction, I favour supporting fixation on the lateral and anterior aspects, with the aim of creating a stable construct that permits immediate or the earliest feasible protected loading.

This is an operative philosophy, not a claim that preserving a particular bone or placing a second plate proves that immediate loading is safe. In this framework, the fixation must serve the position and biological requirements of the fusion. A technically impressive construct still needs satisfactory bone contact, viable surfaces, appropriate alignment and an acceptable soft-tissue envelope.

Evidence

A prospective series of 12 patients treated with a moulded anterior plate reported satisfactory fusion and functional recovery. Its loading descriptions were not entirely consistent: the methods described three weeks without loading followed by walking, while the discussion referred to complete loading at four weeks. Recovery was reported over a wider interval. This small uncontrolled series supports the feasibility of earlier rehabilitation with a particular plated technique, but does not establish a uniform immediate-loading protocol or prove superiority over another construct. [5]

From stability to a loading prescription

The decision should be made for the whole fusion rather than for the plate alone. The surgeon must consider whether the intended position is maintained, whether fixation has dependable purchase and whether an additional procedure creates a separate reason for protection. The operative record can explain why the selected construct is considered suitable for loading, while the rehabilitation prescription describes how that loading will occur.

Preserving the ankle's bony envelope is a preference to apply when compatible with exposure, preparation and correction. It should not prevent removal of non-viable tissue or leave a deformity inadequately addressed. Likewise, additional fixation should answer an identified mechanical need; the number of plates is not itself a loading classification.

Soft-tissue healing may determine the first phase even when the surgeon is satisfied with fixation. In that situation, a short initial restriction with a defined reassessment can remain consistent with an early-mobilisation philosophy. Conversely, if loading starts immediately, the plan must still specify the protective device, assistance and activity limits. Later progression depends on review of the patient and reconstruction, rather than the calendar alone.

CHAPTER 07

7 Subtalar fusion

My operative preference

For subtalar fusion, my emphasis is on careful preparation of the joint, close apposition of the prepared surfaces, appropriate bone grafting and dependable screw or plate fixation. The intention is to create the conditions for union while allowing the patient to mobilise as early as the complete reconstruction permits. Fixation and biological preparation belong to the same decision; neither should be considered in isolation.

In this framework, the immediate question is whether the prepared fusion and its fixation can tolerate the planned protected activity. That assessment is more specific than asking whether the patient has large screws. The indication, residual gaps, correction achieved, bone quality and soft tissues all influence the interpretation of mechanical stability.

Evidence

Bürgi and Hintermann described 13 consecutive subtalar fusions using two compression screws with graft. All fused in satisfactory position. Their technique permitted early loading once swelling settled, initially with crutches; the report also allowed a few days of unloading for wound healing and longer protection for poor bone. Four patients later underwent further procedures for persistent symptoms. This provides a useful technique-specific example, but its small uncontrolled design cannot establish safety for every subtalar construct or patient. [6]

A later multicentre series of 119 post-traumatic subtalar fusions associated successful union with aspects of screw fixation and autograft use. It reinforces the importance of mechanics and biology, but loading began at eight to twelve weeks. Its findings therefore cannot be used as evidence for immediate loading. The associations were observational and do not establish that a particular screw or graft guarantees union. [7]

Protecting the complete reconstruction

A subtalar fusion undertaken for straightforward arthritis is not necessarily equivalent to a reconstruction involving substantial deformity, bone loss or additional joints. Combining their results under one early-loading label can conceal clinically important differences. The rehabilitation plan should identify the feature that most needs protection and explain how the boot, cast or walking aid addresses it.

The author's preference for early mobilisation should therefore be expressed as an aim with conditions. Where the construct, wound and patient are suitable, protected loading may be considered from an early stage. Where a concern remains, the reason for restriction and the review point should be explicit. This makes restriction an active clinical decision rather than an unexplained default, while preserving the ability to change course as healing progresses.

CHAPTER 08

8 Talonavicular and triple fusion

My operative preference

My preferred approach to talonavicular fusion combines thorough joint preparation, bone packing where appropriate and strong fixation, including double plates when suitable. In triple fusion, the same principles must address the subtalar, talonavicular and calcaneocuboid joints together. The purpose is to obtain a stable, well-aligned reconstruction that can support early protected mobilisation when the biological and soft-tissue conditions permit.

In a multiple-joint reconstruction, confidence in one fusion site does not settle the loading decision for the others. The plan needs to account for each prepared joint, the overall correction and any additional procedure. A shared postoperative prescription should reflect the part of the reconstruction requiring the greatest protection.

Evidence and practice variation

A prospective study of 30 talonavicular fusions using angle-stable mini-plates described reduced loading initially and full loading in an orthosis after six weeks. It supports the use of stable plated fixation, but did not test immediate unrestricted loading. The construct and rehabilitation cannot automatically be equated with the author's double-plate preference. [8]

BOFAS provides an example ankle and triple-fusion rehabilitation schedule that begins with unloading and introduces protected loading after clinical and radiographic review, commonly around six to eight weeks. This is an educational example of current practice, not a trial showing that every patient needs the same restriction. Its relevance is that substantial variation persists and earlier protocols require an explicit rationale. [17]

A deliberate individual decision

The evidence available here does not justify describing immediate loading after all talonavicular or triple fusions as proven. The book instead sets out a clinical argument for assessing whether unnecessary restriction can be reduced after an appropriately planned reconstruction. That argument should remain distinguishable from the results of comparative research.

For the individual patient, the surgeon can describe the intended protection in functional terms. Short assisted transfers, limited household walking in a prescribed device and a return to normal walking are different permissions. The patient should be able to explain which applies, how to use the device and whom to contact if it becomes uncomfortable or the wound deteriorates.

Follow-up provides the opportunity to reconsider both excessive and insufficient protection. Persistent swelling, wound problems, concerning pain or uncertainty about the reconstruction may justify continued restriction. Satisfactory progress may allow a broader activity plan. Recording that reasoning makes the progression understandable to the patient and to every clinician involved in rehabilitation.

CHAPTER 09

9 Total ankle replacement

My preference for early mobilisation

My preference is to mobilise patients after ankle replacement as early as the implant, reconstruction and soft tissues allow. Modern replacement designs offer a basis for considering earlier loading, but permission must follow assessment of the actual operation. The early rehabilitation plan should be agreed with the same care as component positioning and soft-tissue balance.

The language used to describe the implant matters. Bone-facing metal components and the polyethylene bearing perform different functions. Porous surfaces, and hydroxyapatite coatings in some designs, are intended to support biological fixation at the bone interface. [11][19] They do not mean that integration has already occurred at the end of surgery, or that all ankle replacements share one rehabilitation protocol.

Evidence

A retrospective INBONE II study compared loading at three weeks in 50 patients with six weeks in 27 patients. Earlier loading was associated with better recovery of motion without a statistically detected increase in reported complications. This is encouraging, but it is a small, single-surgeon observational comparison of three and six weeks, not evidence for day-one loading. [9]

A separate randomised study enrolled 20 patients after a three-component cementless replacement and compared early mobilisation with six weeks in a walking cast. Several functional and patient-reported outcomes were similar at two years. Mobilisation and loading are not interchangeable exposures, and such a small trial cannot resolve uncommon complications. [10]

Manufacturer information for the Infinity system distinguishes the metal tibial and talar components from the polyethylene insert and describes porous-metal options intended to facilitate ingrowth. This supports accurate implant terminology. It does not independently establish the safety of an immediate-loading regimen. [11]

Reconciling the implant and the wound

In this framework, the earliest feasible loading date is determined by the complete procedure. Additional bone or soft-tissue surgery may require protection even when the replacement itself appears satisfactory. The selected implant's instructions and the surgeon's assessment should be reconciled in a single documented plan, rather than giving the patient different dates from separate parts of the care pathway.

Early walking should also be considered separately from ankle exercises, prolonged standing and unsupported activity. A protective device may permit one activity while limiting another. Wound review, swelling and the patient's ability to use aids remain relevant throughout the initial period. The objective is a coherent route back to function, with enough protection for the reconstruction and as little unnecessary loss of independence as circumstances permit.

CHAPTER 10

10 Midfoot fusion, Lisfranc surgery and Lapidus reconstruction

My operative preference

For midfoot and Lisfranc fusions, my preference is meticulous joint preparation, appropriate compression and solid plate fixation. I apply the same reasoning to the Lapidus procedure: create a stable reconstruction and consider immediate or the earliest feasible protected loading, while respecting the wound and the specific correction. The aim is useful mobilisation that the patient can perform safely and consistently.

The names of these procedures can conceal different biological tasks. Fixation of a Lisfranc injury preserves joints in some operations, whereas arthrodesis deliberately prepares selected joints for union. A Lapidus reconstruction concerns the first tarsometatarsal region within a particular forefoot correction. Evidence from one should be transferred to another only with a clear explanation of what is comparable.

Evidence

A multicentre retrospective study of 367 modified Lapidus procedures compared loading within 21 days with loading after 21 days. Reported nonunion rates were 7.1% and 6.0%, respectively, and an increased risk with earlier loading was not detected. The study supports considering earlier rehabilitation in selected constructs, but its definition includes a three-week window. It does not establish that every Lapidus operation permits immediate unrestricted loading, and residual confounding remains possible. [12]

A series of 22 selected low-energy Lisfranc injuries treated by percutaneous screw fixation used three weeks without loading before allowing weight bearing as tolerated. The reported functional results were favourable. This was neither an immediate-loading study nor a study of primary fusion, and its findings should not be extended automatically to high-energy injury, extensive comminution or compromised soft tissues. [13]

Translating the preference into practice

In this framework, rehabilitation planning starts with a description of what was reconstructed and what must be protected. The surgeon should distinguish permitted contact for balance or transfers from a walking programme, and explain whether forefoot push-off is restricted. Protective footwear and aids need to fit the patient's practical circumstances; an instruction that cannot be followed reliably deserves reassessment.

The plan should also allow for differences between an isolated procedure and a combined reconstruction. A patient may have stable midfoot fixation but an additional osteotomy, tendon procedure or wound concern that sets the initial limit. Early mobilisation remains a worthwhile aim when it can be achieved within those conditions.

At review, progress should be judged against the intended reconstruction and the patient's actual activity. The decision to expand walking should follow a documented assessment, not merely the presence of plates on an image. This approach preserves the author's preference for dependable fixation and early function without presenting the available observational evidence as a universal loading rule.

CHAPTER 11

11 Forefoot osteotomies, lesser toes and tendon procedures

My preference for protected walking

After suitable forefoot correction, my preference is to permit early walking with stable fixation and the protection required by the operation. For scarf, Akin, chevron and related osteotomies, this may mean taking weight predominantly through the heel initially, using prescribed footwear and avoiding excessive pressure during forefoot push-off. The permission is for a defined pattern of walking, not unrestricted use of the foot.

The same distinction matters after lesser-toe correction, tenotomy and procedures involving K-wires. A patient may be able to stand or walk with protection while the operated forefoot remains vulnerable during propulsion or accidental contact. In this framework, the dressing, shoe, walking aid and instructions must work together.

Evidence and practical protection

A retrospective series of 178 scarf osteotomies permitted immediate loading in a forefoot-relief orthosis for four weeks after screw fixation. It provides an example of protected immediate walking, but was not a trial comparing loading regimens. It cannot establish equivalent safety for every osteotomy or justify normal-shoe push-off immediately after surgery. [14]

Royal National Orthopaedic Hospital guidance describes heel-dominant walking when necessary after bunion and lesser-toe operations, with protection of exposed K-wires and attention to the wound. This is an institutional care pathway rather than comparative evidence. The presence of a wire does not remove the need to specify how the patient may walk. [15]

Tendon procedures need their own instructions

A tendon procedure should be identified precisely rather than placed under a general permission for early loading. Release, repair, transfer and reconstruction have different purposes. The planned activity must respect the intended healing position and any movement restrictions. When bone and tendon surgery are combined, the patient needs one integrated plan that accounts for both.

A randomised trial of 150 Achilles repairs compared early functional mobilisation in an orthosis with an initial period of unloading. Early mobilisation did not significantly reduce ultrasound-detected deep venous thrombosis. This finding is important when explaining expected benefits: permission to walk is not a guarantee of substantial activity and does not replace individual VTE assessment. [16]

Keeping the instructions usable

The surgeon should describe what heel-protected walking looks like, how far the patient may walk and how the shoe or boot should be used. The patient should also understand that a dressing or exposed wire needs protection from accidental impact. If balance, pain or the home environment makes the prescribed pattern difficult, the rehabilitation team should help revise the practical arrangement.

The principle is to preserve mobility while protecting the operated tissues. A smaller incision or a familiar implant should not substitute for that judgement. The loading prescription remains a clinical decision to document, explain and review.

CHAPTER 12

12 Shared decisions and practical rehabilitation

Agreeing a plan that can be followed

Shared decision-making begins with explaining what the reconstruction needs and what the patient needs to do at home. The discussion should distinguish the possibility of earlier independence from the uncertainty surrounding a particular loading strategy. I favour an explanation of the reason for each restriction, because an instruction is easier to follow when its purpose is understood. The patient should know whether protection concerns the wound, a fusion, an osteotomy, an implant or an associated soft-tissue repair. Where more than one reasonable option exists, practical circumstances and patient priorities can contribute to the decision without obscuring the limits of available evidence.

The agreed category and its practical instructions should be carried through the care pathway. In my proposed framework, that written plan is then translated into the patient's ordinary activities. Getting out of bed, standing to wash and walking to the bathroom should have an understandable place within it. A label alone is insufficient if the patient and therapists interpret it differently. The operating surgeon, ward team and rehabilitation staff should work from the same instructions, with a clear route for resolving uncertainty.

Reviewing progress rather than imposing a universal calendar

This book does not propose one timetable for all foot and ankle operations. A calendar can organise follow-up, but progression should remain connected to the relevant clinical findings and the original purpose of protection. At review, the team can consider the wound, symptoms, swelling, maintenance of correction, imaging where indicated and the patient's actual mobility. A satisfactory assessment may support a change in activity or protection; a concern may justify holding the current stage or revising it. The important point is that a change should be a deliberate decision, understood by the patient and communicated consistently.

Rehabilitation should also distinguish walking permission from exercises, footwear changes, work and leisure activities. A patient may be allowed to walk in a boot without being ready for resisted exercise or normal shoes. Returning to a seated job involves different practical demands from climbing ladders, carrying heavy loads or standing for an entire shift. Driving raises additional questions about the operated side, immobilisation, control and the ability to respond safely. Rather than treating all these activities as consequences of one loading label, my framework asks the team to address the activities relevant to that person's recovery.

Responding when recovery changes

A useful plan explains how to obtain advice if recovery changes unexpectedly. Increasing wound concerns, a problem with the protective device or a substantial change in pain or swelling should prompt contact with the treating service rather than an improvised increase in activity. Patients also need the service's emergency advice for symptoms that may indicate a serious complication. This is not an argument for making people fearful of movement. It is a way of making early rehabilitation workable: the patient knows what has been agreed, what remains protected and whom to contact when the situation no longer fits the plan.

A sequence for clinical reasoning

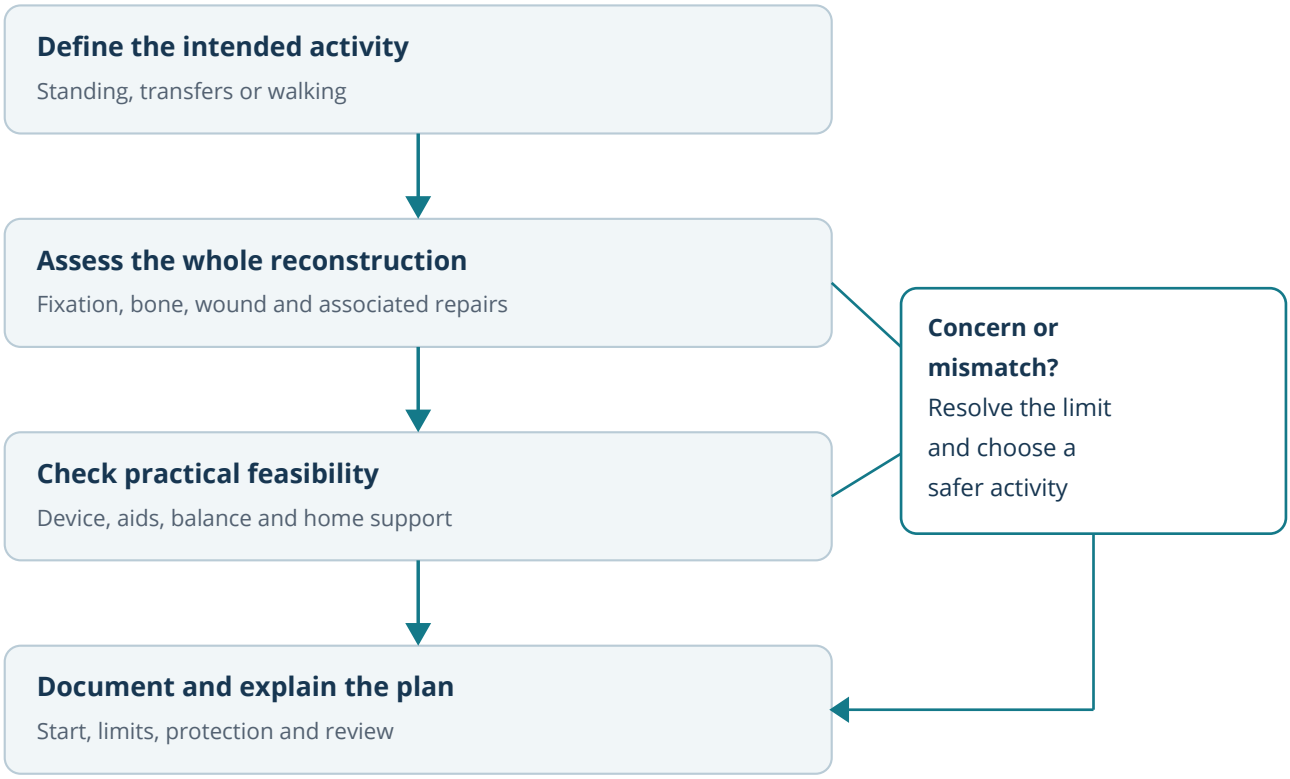


Figure 2. Author-proposed sequence for a loading discussion. This is a reasoning aid rather than a validated decision rule. A concern can lead to a different activity, additional protection, a change in assistance or a period of unloading with reassessment.

The record should explain the decision

The same findings may justify different practical solutions in different patients. What matters is that the proposed activity, protection and review address the identified concern. A plan that cannot be followed should return to clinical assessment rather than remain an instruction on paper.

CHAPTER 13

13 Understanding the evidence and improving practice

What the supporting review can tell us

The supplied manuscript and summary table represent valuable preparatory work by the original review team. They identify eight comparative studies of immediate loading after ankle fracture fixation. Their contribution is acknowledged here without presenting this book as a new systematic review or claiming that its author alone performed that work. The material provides a starting point for examining selected fracture populations, methods of protection and reported outcomes. It does not directly evaluate the full range of elective operations discussed in this book, and its findings should not be transferred automatically to fusion, replacement or forefoot reconstruction.

The distinction matters because evidence about one operation answers a particular question. A fracture held by internal fixation, a joint prepared for fusion and a replacement relying on initial fixation followed by integration are different clinical situations. Even within one category, patient selection and associated procedures can alter the comparison. The procedure chapters therefore examine relevant studies separately and identify where the discussion rests on the author's rationale or preference. This narrative approach keeps useful evidence visible while avoiding a single pooled conclusion that appears more general than the underlying research can support.

Reading a loading study carefully

Before applying a study, the reader should establish when loading began, what the patient was allowed to do and what protection accompanied it. Immediate loading on the first postoperative day differs from loading introduced after two or three weeks. A walking boot, cast, pressure dressing and ordinary shoe are not interchangeable, and movement restrictions may also differ between groups. The comparison may therefore concern a package of rehabilitation measures rather than loading time alone. Clear reporting of these details helps clinicians judge whether the published intervention resembles the plan being considered for their own patient.

A finding of no statistically significant difference in complications requires careful interpretation. It does not establish that two approaches are equivalent or that uncommon harms have been excluded. Study size, follow-up, outcome definitions and the uncertainty around an estimate all matter. Observational studies can also be affected by the reasons surgeons selected one patient for earlier loading and another for restriction. Randomised trials address some of those selection problems, but their findings still apply within the populations and procedures studied. These considerations support cautious application of evidence rather than rejection of early rehabilitation or unqualified acceptance of it.

A proposed programme of clinical learning

My proposed audit framework would record the operation, patient factors, fixation, planned loading, protection, actual mobility and reasons for any change. Outcomes should include healing, wound problems, loss of correction, further surgery and patient-reported recovery, alongside independence and return to usual activities. Falls and thromboembolic events should be recorded explicitly if their reduction is an intended benefit. Comparisons would need to account for differences between patients and procedures, rather than grouping every operation together. Such work would make the clinical philosophy testable and help determine where earlier loading improves care, where protection remains necessary and where uncertainty warrants prospective research.

FOR THE TREATING TEAM

Appendix A Loading plan worksheet

Author-proposed worksheet for recording and communicating an individual loading plan.

Record	Complete for this patient
Patient and operation	Identifiers, date, side, all procedures and responsible clinician
Loading status [1]	Non Weightbearing / Limited Weightbearing / Unrestricted Weightbearing
Start and review	First permitted date or clinical trigger; next review and clinician
Reason for any restriction	The specific bone, fixation, wound, tendon or patient issue being protected
Permitted activities	Transfers, indoor walking, stairs and other tasks; any distance restriction
Region and technique	Heel-only restriction if applicable; explicit instruction about forefoot push-off
Protection	Exact shoe, boot, cast or brace; when worn and when removal is permitted
Walking support	Aids, assistance, therapy assessment and home arrangements
Movement and exercise	Allowed joint movements and any tendon-specific limits
Wound and device care	Dressing instructions, elevation, skin checks and planned wound review
VTE plan	Risk/bleeding assessment and any prescribed prevention with duration
Escalation	Symptoms requiring contact; telephone details; what to do after a fall
Patient understanding	Teach-back recorded; written copy given; communication or support needs

READ ALONGSIDE YOUR OWN CARE PLAN

Appendix B Questions for patients

The questions that make the plan usable

Before discharge, ask your team to show you what you may do. Is the foot allowed on the floor today? Is walking limited to essential transfers, or can you walk further? Must the boot or special shoe be worn for every step? Are you allowed to roll forward onto the toes? Ask separately about stairs, exercises, bathing, driving and work. Being able to stand is not the same as being ready for all these activities.

Demonstrate the instructions back to the physiotherapist or nurse. Explain what you will do at night, how you will reach the toilet and who will help if you cannot manage. If the plan cannot be carried out safely at home, tell the team before leaving. A different aid, more assistance or a reassessment of the prescription may be needed. Do not improvise hopping or abandon protection because the written plan is impractical.

When recovery needs reassessment

Contact the surgical team promptly for wound opening, new discharge, spreading redness, fever, a damaged cast or boot, a displaced exposed wire, increasing numbness, or new difficulty taking the permitted steps. Seek urgent assessment for a cold, pale or blue foot, severe escalating pain, or a new deformity after a fall. These are reasons to assess what has changed, rather than simply push through the exercise plan.

New calf or thigh pain with swelling needs urgent assessment for a possible clot. In the UK, seek urgent GP advice or NHS 111 if DVT is suspected. Chest pain or shortness of breath with possible clot symptoms requires emergency help through 999 or A&E. Do not drive yourself in an emergency. Early walking does not exclude a blood clot. [18]

Follow the individual instructions for dressings, prescribed medicines, elevation and footwear. Increase activity only within the agreed plan. If pain relief or a nerve block makes the foot feel comfortable, this does not prove that the reconstruction or skin can tolerate more loading. Report changes and use the planned review to decide the next stage with your team.

PROVENANCE AND EVIDENCE SCOPE

Appendix C Supporting materials

The supplied DOCX is titled Immediate weightbearing following foot and ankle surgery. The accompanying workbook is labelled a summary table for a systematic review and meta-analysis. The table lists eight studies and 995 patients in total. These are descriptors of the supplied working extraction, not a newly verified pooled population. Its search was reported as ending on 30 July 2025.

The visible manuscript credits screening and extraction to reviewers D.G. and O.G. but does not provide a complete author list. This book acknowledges the work of the review team without assigning unverified authorship. The research team retains authorship of its review. This monograph is separately authored by Mr Peyman Bakhshayesh and draws on his current dictated clinical philosophy.

Study listed in supplied material	Design as listed	Clinical scope
Carver 2025	Retrospective cohort	Operative ankle fracture fixation
Finsen 1989	Randomised trial	Operative ankle fracture fixation
Lee 2022	Retrospective cohort	Lateral malleolar fracture fixation
Gul 2007	Retrospective cohort	Operative ankle fracture fixation
Cunningham 2021	Retrospective cohort	Bimalleolar and trimalleolar fracture fixation
Fram 2021	Retrospective cohort	Selected malleolar fracture fixation
Khojaly 2025	Randomised trial	INWN ankle fracture fixation trial
Smeeing 2020	Randomised trial	Selected ankle fracture fixation

The underlying extraction and pooled figures require reconciliation before they can support a new systematic-review publication. This book therefore uses the table as a map to the clinical question and reports selected independently checked studies in the relevant chapters. No combined complication risk ratio or return-to-work estimate is carried forward. The original spreadsheets, forest plots and manuscript remain separate working materials.

References were checked through targeted searches on 12 November 2026. Primary studies and official guidance were prioritised, with sources selected to clarify the operations and loading decisions discussed here. This was not a registered review with a new exhaustive search, duplicate screening or formal GRADE assessment. Where the available evidence does not directly test immediate loading, the text says so.

FROM SKETCH TO TEACHING ILLUSTRATION

Appendix D The original drawing

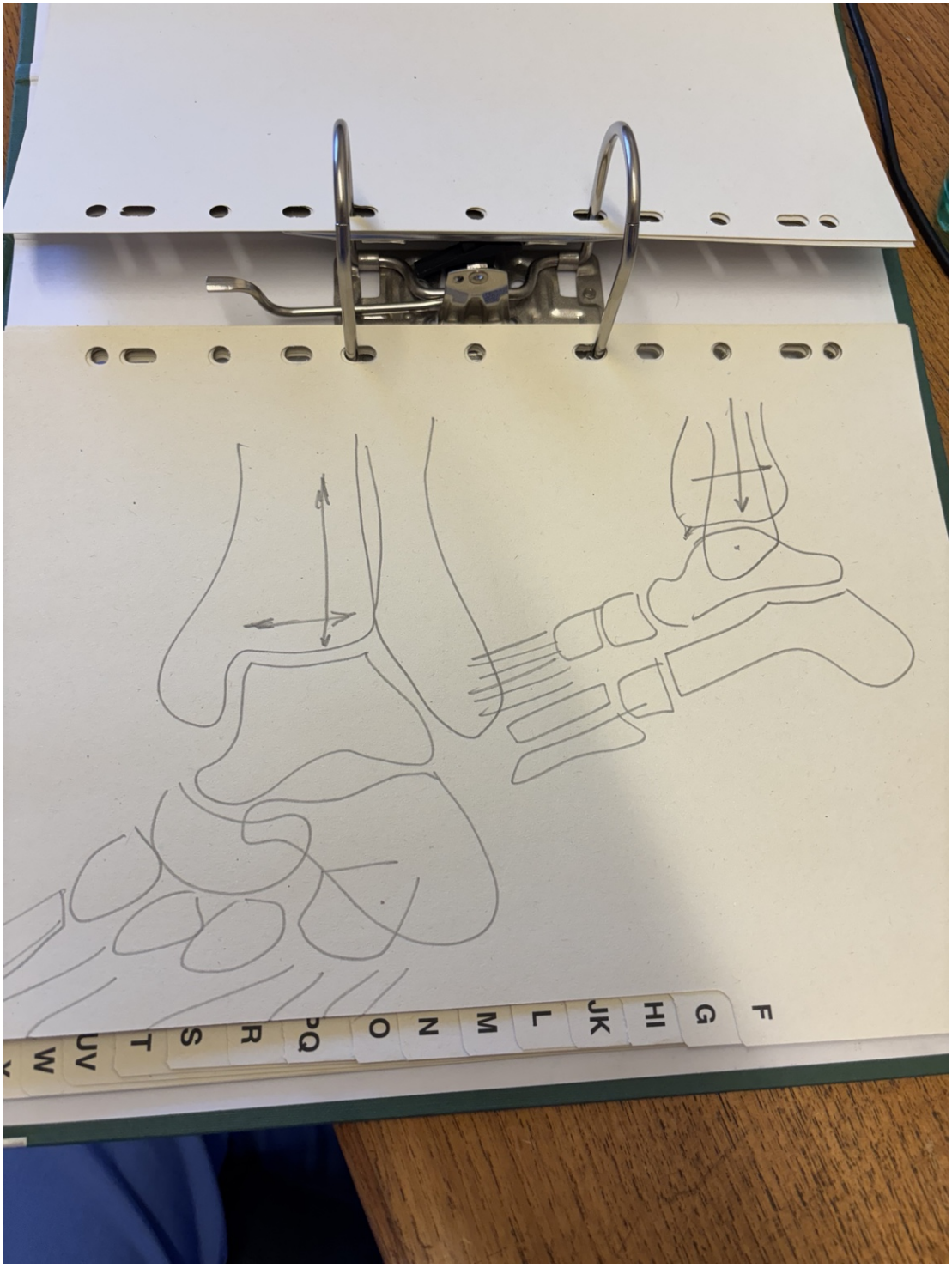


Figure 3. The author's original hand-drawn sketch, supplied on 12 November 2026. It records an early visual explanation of loading through the foot and ankle. The finished cartoon in Figure 1 expands the incomplete forefoot and incorporates the subsequent anatomical correction. The sketch is reproduced as an authorial source, not as a fully labelled anatomical drawing.

SELECTED PRIMARY STUDIES AND OFFICIAL GUIDANCE

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Numbered citations refer to the sources below. The list is selected for this clinical monograph and is not an exhaustive systematic-review bibliography. Online guidance and device documents should be checked again when making a patient-specific decision.

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Related work by the author

Bakhshayesh P. Philosophy of Foot and Ankle Surgery. Illustrated edition, October 2026. Read the companion book.

Author's current dictated material and original artwork supplied on 12 November 2026; supporting working manuscript and spreadsheet described in Appendix C. These are author-supplied sources rather than independently published evidence.