Chapter 2: Indications, Contraindications, and Goals of Splinting

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Orthopedic splinting is not merely a mechanical task—it is a critical, patient-centered clinical decision grounded in anatomical, physiological, and pathological understanding. In emergency departments, urgent care clinics, outpatient orthopedic practices, and surgical recovery settings, splinting is frequently one of the first and most impactful interventions performed. Whether stabilizing an acute fracture, managing postoperative healing, or supporting a chronic musculoskeletal condition, the decision to immobilize must be made with precision and an awareness of the broader implications for recovery and function.

This chapter aims to provide a comprehensive and evidence-informed exploration of the clinical rationale for immobilization. It begins by identifying the full range of indications for splinting, supported by a review of the pathophysiological mechanisms that make immobilization therapeutic. It then addresses contraindications to splinting—conditions in which immobilization may cause harm or delay more appropriate interventions—requiring the clinician to critically assess when not to immobilize or when to alter technique. Finally, the chapter concludes with a deep dive into the goals of immobilization, examining the biomechanical, functional, protective, and psychological benefits that an expertly applied splint provides.

By understanding the indications, contraindications, and goals of splinting in a unified framework, orthopedic technologists and healthcare professionals are equipped to make nuanced clinical judgments. Immobilization is not a standalone treatment—it is a bridge to healing, a protective measure, and, when applied appropriately, a powerful contributor to long-term functional success.

Section A: Indications for Immobilization

Contraindications can be divided into two categories:

Immobilization is a foundational strategy in orthopedic care that aims to support injured tissues, limit motion, alleviate pain, and facilitate biological healing. In both emergency and elective settings, splinting is often the initial step in musculoskeletal stabilization, particularly when soft tissue swelling, neurovascular monitoring, or transport are concerns. The clinical indications for splinting are varied and span both traumatic and non-traumatic pathologies. This section provides an exhaustive review of conditions warranting orthopedic immobilization, with emphasis on the pathophysiology, goals of care, and clinical rationale.

I. Acute Fractures

Fractures represent one of the most common and well-established indications for immobilization. Proper stabilization limits micromotion at the fracture site, which in turn:

- Reduces pain and reflex muscle spasm
- Minimizes the risk of further displacement or angulation
- Protects neurovascular structures
- Allows periosteal and endosteal callus formation to initiate uninterrupted

Commonly splinted fracture types include:

- Distal radius/ulna → Volar or sugar-tong splint
- Metacarpals or phalanges → Ulnar or radial gutter splints
- Ankle and foot fractures → Posterior ankle and stirrup splints
- Humeral shaft or elbow fractures → Long arm posterior splint

In emergency care, splinting also permits accommodation of post-injury edema—a key consideration in fractures with extensive soft tissue involvement or blunt trauma (Tintinalli et al., 2020).

II. Joint Dislocations and Subluxations

Post-reduction immobilization of a joint is critical to:

- Maintain proper joint alignment
- Prevent re-dislocation
- Allow capsuloligamentous healing
- Minimize pain and inflammation

Examples include:

- Anterior shoulder dislocation → Shoulder immobilizer or sling and swathe
- Patellar dislocation → Knee immobilizer or posterior knee splint
- Elbow dislocation → Long arm posterior splint in flexion

Immobilization duration varies by joint and recurrence risk. For example, first-time anterior shoulder dislocations in young athletes may warrant up to three weeks of immobilization followed by controlled rehabilitation, whereas older adults may require a shorter duration due to stiffness risk (McRae & Esser, 2016).

III. Ligamentous Injuries and Sprains

Ligament sprains—graded I to III based on severity—are frequent indications for temporary immobilization to reduce stress on healing fibers, limit inflammation, and promote early mobilization once acute symptoms resolve.

Common scenarios:

- Ankle inversion sprains (Grade II–III) → Stirrup splint or CAM walker
- Thumb UCL tear ("skier's thumb") → Thumb spica splint
- Knee MCL injury → Knee immobilizer (initial) with progression to functional brace

Immobilization should balance protection and prevention of joint stiffness or muscle atrophy. Typically, ligament injuries are immobilized for 1–3 weeks before transitioning to early rehabilitation with a hinged or functional brace.

IV. Tendon Injuries and Repairs

Tendons are delicate structures prone to elongation or rupture without proper protection. Immobilization is crucial in both conservative and post-surgical tendon injury management.

Clinical examples:

- **Extensor tendon lacerations** (zones I–VII) → Static splints that preserve length-tension relationships
- **Flexor tendon repairs** → Dorsal blocking splints to prevent rupture from active extension
- **Mallet finger** → Continuous DIP extension splinting for 6–8 weeks

Each tendon injury requires positioning that reduces tension at the repair site. Inadequate immobilization may lead to gapping, scar adherence, or functional deficits (Zlotolow et al., 2013).

V. Postoperative Immobilization

After surgical intervention involving bones, joints, tendons, or ligaments, immobilization helps:

- Protect surgical hardware or suture lines
- Allow soft tissue healing and graft integration
- Maintain specific positioning critical to functional outcomes (e.g., elbow at 90°)
- Reduce swelling and postoperative discomfort

Procedures such as open reduction internal fixation (ORIF), ligament reconstructions, and tendon transfers often require postoperative splinting ranging from temporary immobilizers to custom-molded orthoses depending on the surgeon’s protocol.

VI. Soft Tissue Trauma

Significant soft tissue injuries such as deep contusions, hematomas, and crush injuries may benefit from immobilization to:

- Reduce mechanical stress and secondary injury
- Prevent muscular contraction that worsens bleeding or swelling
- Improve patient comfort

Splinting in a position of function or rest helps preserve range of motion and muscle alignment while tissues recover.

VII. Infections and Inflammatory Conditions

Although immobilization is not curative for infections, it plays a supportive role in reducing the systemic and local inflammatory burden in conditions such as:

- Septic arthritis
- Cellulitis with joint involvement
- Tenosynovitis

Resting the joint through splinting minimizes inflammatory cytokine release triggered by mechanical stress, relieves pain, and enhances compliance with antibiotic therapy (Weber & Bae, 2018).

VIII. Neurological and Neurovascular Indications

Neurological impairments may result in spasticity, flaccidity, or sensory loss. Splinting in such cases prevents secondary complications including:

- Joint contractures and Muscle shortening
- Malalignment of flaccid limbs
- Pressure sores due to poor proprioception

Examples:

- Radial nerve palsy → Dynamic extension splint
- Cerebral palsy or stroke → Resting hand splints to preserve neutral positioning and function

  These patients may require customized orthoses and regular reassessment by a multidisciplinary team (Braddom et al., 2021).

IX. Overuse Syndromes and Chronic Disorders

Splinting also has a role in managing non-traumatic conditions. It limits repetitive motion and provides localized rest in cases of:

- **Carpal tunnel syndrome** → Neutral wrist splint (especially during sleep)
- **De Quervain's tenosynovitis** → Thumb spica splint
- **Lateral epicondylitis** → Counterforce bracing or wrist cock-up splint

Such devices are often used intermittently and in conjunction with physical therapy, ergonomic corrections, or corticosteroid injections.

X. Emergency and Transport Indications

In the prehospital and emergency department environment, splints provide temporary immobilization during:

- EMS transport
- Field stabilization in athletic or combat settings
- Pain control before definitive management

Proper splinting at the time of injury is shown to reduce further tissue damage and lower the risk of compartment syndrome in fractures involving long bones (PHTLS, 2020).

Conclusion

The indications for splinting are extensive and encompass a wide array of orthopedic, neurologic, infectious, and soft tissue conditions, ranging from acute traumatic injuries to chronic overuse syndromes and complex postoperative needs. Splinting is not a one-size-fits-all solution; rather, it is a strategic, targeted intervention that must be tailored to the specific anatomical site, injury mechanism, tissue involved, and phase of healing. Clinical judgment is paramount in guiding not only the decision to immobilize but also determining the optimal timing, material selection, anatomical positioning, and duration of splint use.

An in-depth understanding of the underlying pathophysiology behind each indication enables clinicians to implement splinting in a way that truly complements the body's natural healing processes. Immobilization should be viewed not merely as a passive measure, but as an active therapeutic tool that can reduce inflammation, stabilize joint mechanics, optimize blood flow, and prevent secondary complications such as deformity, nerve compression, or chronic dysfunction.

Moreover, the application of splints must always be accompanied by a comprehensive clinical assessment that includes evaluation of neurovascular status, mechanism of injury, patient comorbidities, functional limitations, and psychosocial considerations. The orthopedic technologist or clinician must also remain vigilant about potential downstream consequences of improper immobilization—including joint stiffness, muscle atrophy, skin breakdown, or delayed union of fractures—by balancing protection with the eventual need for mobilization and rehabilitation.

As such, competency in splinting extends beyond technical proficiency; it demands critical thinking, interdisciplinary communication, and a patient-centered mindset. In emergency departments, urgent care settings, and orthopedic clinics, those applying splints must function as both skilled practitioners and thoughtful clinical decision-makers. When properly executed, splinting not only protects injured tissues but actively promotes recovery, restores function, and enhances the overall quality of orthopedic care.

References

- Braddom, R. L., Dillingham, T. R., & Mayer, N. H. (2021). Braddom’s Physical Medicine and Rehabilitation (6th ed.). Elsevier.
- McRae, R., & Esser, M. (2016). Practical Fracture Treatment (6th ed.). Elsevier Health Sciences.
- Mubarak, S. J., & Owen, C. A. (1975). Double incision fasciotomy of the leg for decompression in compartment syndromes. Journal of Bone and Joint Surgery, 57(1), 37–39.
- Prehospital Trauma Life Support Committee of the National Association of Emergency Medical Technicians (NAEMT). (2020). PHTLS: Prehospital Trauma Life Support (9th ed.). Jones & Bartlett Learning.
- Tintinalli, J. E., Ma, O. J., Yealy, D. M., Meckler, G. D., Stapczynski, J. S., & Cline, D. M. (2020). Tintinalli's Emergency Medicine: A Comprehensive Study Guide (9th ed.). McGraw-Hill Education.
- Weber, R. A., & Bae, D. S. (2018). Infections of the hand. In R. W. Bucholz, J. D. Heckman, & C. M. Court-Brown (Eds.), Rockwood and Green’s Fractures in Adults and Children (9th ed.). Wolters Kluwer.
- Zlotolow, D. A., Yuen, J. C., & Lee, W. P. A. (2013). Flexor tendon repair and rehabilitation. Journal of Hand Surgery, 38(10), 2061–2070. https://doi.org/10.1016/j.jhsa.2013.07.002

Section B: Contraindications to Splinting

While splinting remains an essential and versatile tool in musculoskeletal management, it is not universally appropriate in all clinical scenarios. There are specific conditions and circumstances in which splinting is either contraindicated outright, requires significant caution, or must be delayed or adapted. These contraindications are typically informed by the risk of iatrogenic harm, including skin breakdown, neurovascular compromise, infection propagation, and missed or delayed
diagnosis of emergent conditions.

- Absolute Contraindications – Conditions where splinting is inappropriate or potentially harmful unless life- or limb-saving measures are concurrently taken
- Relative Contraindications – Scenarios in which splinting may be performed with modifications or under specific precautions

Each contraindication must be weighed against the risks of non-immobilization, emphasizing that immobilization is a clinical judgment—not a reflex.

I. Absolute Contraindications to Splinting

1. Open Fractures Prior to Proper Wound Management

Open fractures pose a significant infection risk due to the direct communication between the external environment and the bone. Splinting before proper wound assessment and irrigation can result in:

- Entrapment of foreign material within the wound bed
- Impaired access for surgical debridement
- Compression of viable soft tissue around necrotic debris
- Development of deep infection, including osteomyelitis, which has long-term functional consequences

Clinical action: Apply sterile dressing only. Immobilize the limb minimally for transport (e.g., padded board) and avoid circumferential wrapping over the wound until debridement and surgical intervention have occurred.

2. Compartment Syndrome or High-Risk Limb Swelling

Compartment syndrome is a limb-threatening emergency caused by increased pressure within a fascial compartment, leading to impaired perfusion and irreversible ischemia. The danger with splinting is twofold:

- Tight circumferential wraps or rigid splints may elevate intra-compartmental pressure
- Immobilization may mask progressive symptoms such as increasing pain or neurologic changes

Clinical markers: Pain out of proportion, pain with passive stretch, tense compartments, paresthesia, and pallor are early signs. Pulses may still be present initially and are not a reliable exclusion criterion.

Clinical action: Maintain limb at heart level; do not elevate or compress. Avoid splinting until compartment syndrome is ruled out or fasciotomy is performed.

3. Absent or Severely Compromised Distal Circulation

When a limb presents with diminished or absent pulses, delayed capillary refill, or a cool, cyanotic appearance, applying a splint **before restoring alignment or performing emergent reduction** can worsen ischemia or obscure ongoing vascular deterioration.

Example scenarios:

- Displaced supracondylar humerus fracture compressing the brachial artery
- Dislocated knee compromising popliteal artery flow

Delay in intervention beyond 6–8 hours may result in permanent neurovascular damage and limb loss.

Clinical action: Immediate reduction or vascular consult. Splint only after perfusion is reestablished or stabilized.

II. Relative Contraindications to Splinting (Requires Modification or Monitoring)

1. Severe Soft Tissue Damage Overlying the Splinting Site

Contusions, degloving injuries, lacerations, and avulsions represent compromised dermal and subdermal tissue. Applying pressure with a splint can:

- Exacerbate soft tissue necrosis
- Disrupt capillary beds and lymphatic drainage
- Mask wound drainage or necrotic progression

Adaptations:

- Avoid rigid contact with the injured area; pad liberally
- Use off-loading splint designs
- Apply positioning techniques with foam support or elevation
- Delay rigid splinting until tissue integrity improves

2. Infected Limbs or Septic Joints

Active infection around joints or soft tissues (e.g., cellulitis, septic arthritis, or necrotizing fasciitis) may worsen under immobilization:

- Heat and moisture retention may accelerate bacterial proliferation
- Compression may impair local blood flow and limit antibiotic delivery
- Pain may be aggravated by splint-induced pressure

Exceptions: In cases like septic arthritis, **gentle immobilization for pain relief** may be indicated, but must be monitored closely.

Precautions:

- Use breathable padding, avoid occlusive wraps
- Remove splint frequently to inspect skin
- Coordinate immobilization with infectious disease and surgical teams

3. Rapidly Progressive Edema (Post-Trauma or Reperfusion)

Injuries to highly vascularized areas such as the leg, forearm, or hand often swell considerably in the first 24–72 hours. This edema can lead to:

- Skin tension and blistering beneath the splint
- Nerve compression (e.g., ulnar or peroneal neuropathies)
- Vascular compromise due to wrap-induced compression

Clinical modification:

- Apply **non-circumferential splints** (e.g., posterior slab with loose wrap)
- Use ample padding
- Recheck neurovascular status every 2 hours for the first 12–24 hours
- Elevate limb to promote venous return and reduce fluid accumulation

4. Patient Factors: Claustrophobia, Psychiatric Conditions / Sensory Disorders

Patients with anxiety, PTSD, autism spectrum disorder, or cognitive impairment may become highly distressed or noncompliant with immobilization. Rigid or bulky splints may trigger panic or behavioral agitation, leading to:

- Splint removal or destruction
- Increased pain perception
- Trauma-related regression or combativeness (especially in pediatric or geriatric populations)

Management strategies:

- Offer clear, empathetic explanation of procedures
- Involve caregivers and provide visual cues (splinting dolls, photos)
- Use soft immobilizers when possible
- In rare cases, mild anxiolytics or conscious sedation may be warranted for splint tolerance

5. Contact Allergies to Splinting Materials

Allergic contact dermatitis may occur in reaction to:

- Fiberglass resin
- Neoprene or latex
- Stockinette adhesives
- Polyurethane foam or elastic wraps

Signs include: Erythema, pruritus, vesicles, and sloughing at the skin-contact points.

Prevention:

- Ask about previous reactions
- Use hypoallergenic alternatives (cotton stockinette, silicone liners)
- Apply a protective barrier or secondary wrap before splint contact

6. Poor Patient Compliance or Unsafe Home Environment

Splints lose their therapeutic benefit if patients fail to:

- Maintain correct positioning
- Return for follow-up care
- Avoid wetting or modifying the device

Patients with active substance use disorder, homelessness, dementia, or language barriers may not safely manage a splint independently.

Solutions:

- Involve social work or case management
- Educate family/caregivers on splint use and monitoring

Use protective casts or removeable braces with alarm tags in high-risk cases

III. Environmental or Operational Constraints

In certain field or mass-casualty settings, splinting decisions must balance:

- Transport safety (bulky splints may impair EMS extrication)
- Limited resources (may require improvised splints with minimal stabilization)
- Prolonged travel times (require easily adjustable or removable devices)

Best practices: Use modular or soft splints that stabilize the limb without restricting emergency access or visibility.

Conclusion

Contraindications to splinting are as critical to patient safety as the indications for its use. Improperly applied or ill-timed immobilization can lead to limb-threatening complications, masked emergencies, patient distress, and medicolegal exposure. Orthopedic technologists, emergency clinicians, and casting professionals must therefore be vigilant in evaluating not only the injury, but the entire clinical context—including tissue condition, vascular integrity, cognitive capacity, and environmental circumstances.

When a contraindication exists, the clinician must consider alternative immobilization strategies, defer splinting until stabilization is achieved, or modify standard protocols to protect the patient. Mastery of these decision-making principles ensures that splinting remains a therapeutic ally, not a source of avoidable harm.

Section C: Goals of Immobilization

Immobilization is one of the foundational therapeutic interventions in musculoskeletal care. Its primary purpose is to **stabilize injured or vulnerable anatomical structures** while enabling the body's intrinsic healing mechanisms to function without interruption or re-injury. Proper immobilization is not simply about preventing motion—it is a carefully executed intervention that supports **anatomical alignment, tissue repair, functional preservation, and pain control.**

Understanding the goals of immobilization allows orthopedic technologists, emergency clinicians, and allied healthcare professionals to tailor each splinting intervention to the unique needs of the patient and the nature of the injury. Immobilization must be guided by both **physiological principles and practical considerations**, ensuring that treatment enhances—not impedes—recovery.

I. Promote Healing by Limiting Pathological Movement

At the core of immobilization is the prevention of pathological motion at the site of injury. This is especially critical in:

- **Fractures**, where even micro-movements at the fracture line can disrupt hematoma formation, delay callus development, or result in nonunion.
- **Ligamentous injuries**, where excess strain on injured fibers can lead to lengthening, scarring, or recurrent instability.
- **Tendon repairs**, which require precise control of tension to prevent rupture or adhesion formation.

  By eliminating abnormal movement, splinting **preserves the integrity of newly forming tissue matrices,** allowing for uninterrupted cellular repair processes such as collagen deposition, angiogenesis, and osteogenesis (Braddom et al., 2021).

II. Protect Anatomical Structures from Further Injury

Immobilization creates a **controlled biomechanical environment** that shields the injured area from external forces, unintended patient movement, and weight-bearing stress. This goal is particularly vital in:

- **Joint dislocations**, where stabilization prevents redislocation
- **Open injuries,** where splinting can minimize soft tissue shearing
- **Nerve entrapment syndromes**, such as carpal tunnel syndrome, where neutral positioning reduces mechanical compression

The **biomechanical benefit** of splinting is not just static protection—it also **alters load transmission**, offloading certain anatomical planes while preserving the function of uninvolved segments. For instance, a thumb spica splint immobilizes the first metacarpophalangeal (MCP) joint while preserving digital flexion and wrist function.

III. Facilitate Proper Anatomical Alignment

Maintaining or restoring anatomical alignment is critical in preventing **malunion, joint dysfunction, and post-traumatic deformit**y. Immobilization achieves this by:

- Holding bones in a reduced or nearly reduced position
- Supporting joints in a **position of function or resting position**
- Preventing contractures through gentle extension or flexion as indicated

Proper alignment **reduces compensatory muscular tension**, improves vascular drainage, and facilitates more effective tissue healing under appropriate stress gradients. For example, splinting a wrist in slight extension maximizes flexor tendon function and prevents shortening of the volar structures during immobilization (Zlotolow et al., 2013).

IV. Minimize Pain and Inflammation

Pain reduction is one of the most immediate and observable goals of splinting. Immobilization reduces pain by:

- **Restricting movement** that triggers nociceptive signaling
- **Stabilizing fractures**, thereby reducing muscle spasm and periosteal irritation
- **Allowing rest to inflamed structures**, such as in overuse syndromes (e.g., tendinitis)

By decreasing mechanical irritation, splints help **break the pain-spasm-pain cycle**, particularly in acute trauma and in conditions involving sensitive periarticular structures. Reduced pain facilitates deeper breathing, improved sleep, and better participation in therapy.

V. Preserve Function and Prevent Secondary Complications

Immobilization should always aim to **preserve long-term function** and limit iatrogenic harm. Goals include:

- Preventing **joint stiffness** by immobilizing in functional positions
- Avoiding **muscle atrophy** and disuse by minimizing unnecessary immobilization duration
- Protecting **neurovascular structures** by reducing edema and compression
- Preventing **skin breakdown** by using well-padded, properly applied materials

In the upper extremity, hand-based splints should preserve thumb opposition and metacarpophalangeal flexion, while lower extremity immobilization should consider safe weight-bearing transitions or assistive device compatibility.

Example: Immobilizing the ankle in **neutral dorsiflexion** ensures proper Achilles tendon length and prevents equinus contracture—a common issue with plantarflexion-positioned splints left on too long.

VI. Provide Psychological and Behavioral Benefits

In addition to physical benefits, immobilization can offer significant **psychological reassurance** to patients. Stabilizing a painful or unstable limb can:

- Reduce anxiety about movement or reinjury
- Increase patient trust in the care process
- Improve compliance with activity restrictions

For pediatric patients, geriatric populations, or individuals with developmental disorders, a well-applied splint can also serve as a **behavioral cue** to protect the limb and reduce inadvertent strain during daily activities.

VII. Facilitate Safe Transport and Continuity of Care

In emergency or prehospital care settings, one of the primary goals of splinting is to:

- Prevent **worsening of injuries during transit**
- Reduce the risk of hemorrhage or neurovascular compromise in route
- Enable diagnostic imaging by providing basic stabilization

Additionally, temporary splints serve as a **bridge to definitive care**, maintaining anatomical integrity until further surgical or orthopedic interventions can be safely performed.

VIII. Support Rehabilitation Planning and Gradual Mobilization

Immobilization sets the stage for **progressive rehabilitation** by first protecting injured structures, then **transitioning to dynamic or removable splints** as healing progresses. Modern splinting strategies often involve:

- **Phased immobilization**, gradually restoring range of motion
- **Hybrid orthoses**, allowing joint mobilization while protecting healing tissues
- Use of **night splints or removable braces** during functional recovery

In cases like flexor tendon repair or ligamentous reconstruction, splints are part of **protocol-driven rehabilitation**, where early passive or active motion is introduced under controlled conditions (Strickland, 2005).

Conclusion

The goals of immobilization are far-reaching and multidimensional, encompassing **biological, biomechanical, functional, and psychosocial domains** of healing. Immobilization is not simply a static intervention—it is a dynamic clinical strategy that, when employed with expertise and intention, promotes healing while minimizing the risk of secondary complications. The orthopedic technologist and clinician must understand that every immobilization decision has **short-term consequences** for comfort and tissue stability, and **long-term implications** for function, independence, and quality of life.

When used appropriately, splinting achieves multiple critical outcomes:

- **Reduces pathological motion:** Injured tissues—whether bone, ligament, tendon, or joint capsule—require mechanical stillness to initiate organized healing. Immobilization limits micromovement that could disrupt cellular repair processes, displace fracture fragments, or elongate torn ligaments. Controlled positioning minimizes pain-inducing mechanical stress and preserves joint congruity.

- **Supports tissue healing**: Immobilization creates a **biologically favorable microenvironment** by reducing inflammation, protecting granulating tissue, and preventing reinjury. For example, stabilizing a joint in a neutral or functional position supports tendon gliding and prevents collagen fiber disorganization, allowing the body's reparative processes to proceed efficiently.

- **Prevents deformity:** Without proper immobilization, patients are at risk of malunion, contracture, and joint subluxation—particularly when injury involves muscle imbalance, neurovascular compromise, or open wounds. By preserving anatomical alignment during healing, splints prevent structural complications that can significantly impair long-term mobility and hand function.

- **Alleviates pain:** Immobilization interrupts the cycle of pain, spasm, and inflammation. Mechanical support reduces stimulation of nociceptors, especially in fractures and soft tissue injuries. Furthermore, immobilization reduces muscle guarding and provides psychological reassurance, which further contributes to subjective pain reduction.

- **Preserves function:** Immobilization is not about eliminating motion across the entire limb—it is about protecting injured segments while preserving function in adjacent joints and uninvolved structures. Proper splint design maintains critical positions (e.g., wrist extension, MCP flexion, ankle neutral), which reduces the risk of long-term stiffness, loss of dexterity, or impaired ambulation.

- **Facilitates transition to rehabilitation:** Immobilization is often the **first phase in a comprehensive recovery continuum**. It creates the stability necessary to progress to active range of motion, strengthening, and functional retraining. Thoughtful splinting may also evolve into dynamic orthotic use, activity-specific bracing, or structured withdrawal as healing milestones are reached.

For these goals to be realized, orthopedic technologists and clinicians must approach splinting with **deliberate clinical reasoning and patient-specific customization**. Splints should never be applied as a routine or generalized intervention. Every splint must reflect:

- The **nature and phase of the injury**
- The **expected healing timeline**
- The **functional demands** of the patient
- The **psychosocial factors** that influence compliance and recovery

Ultimately, the purpose of splinting is not merely to immobilize—but to **protect, guide, and empower healing**. The true success of immobilization lies not in the rigidity of the device, but in the precision and purpose with which it is applied. The expert clinician balances the competing needs of **stability and mobility, healing and independence**, creating an environment in which the patient can recover fully, safely, and functionally.

References

Though splints and casts are both integral tools in orthopedic care, their mechanical principles, indications, and clinical implications differ significantly. A nuanced understanding of these distinctions enables clinicians to select the most appropriate immobilization strategy based on patient presentation, injury characteristics, and risk factors. In many cases, splinting serves as a bridge to casting, reinforcing the need for adaptable and patient-centered care in musculoskeletal management.

References

- Braddom, R. L., Dillingham, T. R., & Mayer, N. H. (2021). Braddom's Physical Medicine and Rehabilitation (6th ed.). Elsevier.
- Strickland, J. W. (2005). Development of flexor tendon surgery: twenty-five years of progress. The Journal of Hand Surgery, 25(2), 214–235. https://doi.org/10.1053/jhsu.2000.38183
- Zlotolow, D. A., Yuen, J. C., & Lee, W. P. A. (2013). Flexor tendon repair and rehabilitation. Journal of Hand Surgery, 38(10), 2061–2070. https://doi.org/10.1016/j.jhsa.2013.07.002