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Narrative Review

Rehabilitation After Distal Radius Fracture in Older Patients: A Practical Narrative Review for Clinicians

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Abstract

Background

Distal radius fractures are common injuries in older patients and may temporarily reduce independence and hand function. Rehabilitation is usually included after both conservative and surgical treatment, although rehabilitation strategies remain variable in clinical practice.

Aim

The aim of this narrative review was to summarize practical aspects of rehabilitation after distal radius fracture in elderly patients.

Material and Methods

Literature indexed in PubMed, PEDro, and the Cochrane Library was reviewed in a non-systematic manner using clinically relevant orthopedic and rehabilitation publications related to wrist fracture recovery, physiotherapy, and geriatric rehabilitation.

Results

The literature supports gradual rehabilitation adapted to tolerance, frailty, baseline function, and ability to follow instructions. In uncomplicated fractures, a clear home program often restores useful hand function. Supervised physiotherapy is most valuable when stiffness, weakness, edema, pain, frailty-related limitation, or poor adherence delays recovery.

Conclusions

Recovery after distal radius fracture requires a plan built around practical hand use, independence, and patient tolerance rather than a generic protocol.

Keywords

distal radius fracture; rehabilitation; elderly patients; wrist fracture; geriatric orthopedics; physiotherapy

Introduction

Distal radius fractures are among the most common fractures observed in elderly patients. Their incidence increases with age, especially in women with osteoporosis and increased risk of falls [1,2]. Although these injuries are often treated successfully, many patients experience temporary limitation of daily activities during recovery.

Treatment options include conservative immobilization and surgical fixation. In older patients, the main therapeutic objective is frequently restoration of acceptable hand and wrist function rather than ideal radiographic alignment alone. This pragmatic approach is consistent with current orthopedic discussion regarding common assumptions and evidence in the management of distal radius fractures [3,4].

Recovery is prolonged by comorbidities, degenerative joint disease, reduced muscle strength, and low baseline mobility. Many older patients achieve radiographic healing before they regain confidence and independence. Similar observations about functional recovery in elderly orthopedic rehabilitation have been described in the Journal of Education, Health and Sport [5]. Immobilization itself adds stiffness and weakness, which makes rehabilitation part of treatment rather than an optional extra.

This review summarizes practical rehabilitation after distal radius fracture in elderly patients, with emphasis on decisions that clinicians and physiotherapists face during routine follow-up.

Literature Review Approach

A narrative review of literature indexed primarily in PubMed was performed between January and April 2026. Additional searches were conducted in PEDro (Physiotherapy Evidence Database) and the Cochrane Library in order to identify rehabilitation-oriented publications.

English-language articles related to distal radius fracture rehabilitation, geriatric fracture care, wrist mobilization, edema management, physiotherapy, occupational therapy, and postoperative rehabilitation were reviewed. A Cochrane review on rehabilitation after distal radial fractures was used as one of the key sources for the general rehabilitation background [6].

Example search phrases included:

- "distal radius fracture rehabilitation elderly"
- "wrist fracture physiotherapy"
- "geriatric distal radius fracture recovery"
- "distal radius fracture home exercise"
- "early mobilization distal radius fracture"
- "edema management wrist fracture rehabilitation"

Approximately 80 publications were screened initially, of which 27 publications were considered most clinically relevant for inclusion in the final narrative review. Preference was given to review articles, observational studies, educational publications, clinical recommendations, and selected randomized studies commonly cited in orthopedic and rehabilitation literature. Publications were excluded when they focused primarily on pediatric

fractures, experimental surgical techniques, biomechanical modeling, or non-clinical outcomes. Formal systematic review methodology was not applied.

Distal Radius Fractures in Elderly Patients

Most distal radius fractures in elderly individuals occur after low-energy falls from standing height. Osteoporosis, impaired balance, sarcopenia, visual impairment, and polypharmacy may increase fracture risk. Epidemiological and population-based studies have repeatedly shown that distal radius fractures are frequent in older adults and generate a relevant burden for healthcare systems [7-9].

In older patients, radiographic appearance does not always correspond directly with functional outcome. Some individuals maintain satisfactory daily function despite residual deformity visible on imaging studies. Earlier work on Colles fractures already questioned a simple relationship between anatomical result and final function, and later systematic reviews continued to emphasize the importance of patient-centered outcomes [10,11].

Cast immobilization is still used for stable fractures and lower-demand patients. Surgical fixation is chosen more often for unstable fractures, but better radiographs do not guarantee better long-term function in every older patient [12,13]. Orthopedic guidelines support decision-making based on fracture pattern, age, functional demands, comorbidities, and patient preference [14,15].

Regardless of treatment type, recovery depends on regaining motion, grip, confidence, and practical hand use.

Early Rehabilitation

During immobilization, rehabilitation mainly focuses on:

- Edema reduction
- Maintenance of finger motion
- Prevention of elbow and shoulder stiffness
- Pain control
- Preservation of basic limb function

Patients are encouraged to move the fingers several times daily unless contraindicated. Shoulder and elbow motion should not be forgotten; stiffness in uninvolved joints can become an avoidable second problem.

Edema management is most important during the first weeks after injury. Elevation of the limb and regular movement of uninvolved joints form the basic approach. Compression gloves, kinesiotaping, retrograde massage, and manual lymphatic drainage are described in rehabilitation literature, but evidence for clear superiority of these methods is limited and inconsistent [16-18].

In routine practice, simple low-risk interventions combined with active movement are often sufficient in uncomplicated fractures. Some elderly patients substantially reduce overall physical activity after fracture. In practice, this may contribute to slower recovery and reduced confidence during daily activities.

Mobilization After Immobilization

After cast removal or postoperative stabilization, rehabilitation usually progresses toward restoration of wrist motion and gradual return of hand function. Early mobilization after volar

plate fixation has been investigated in clinical studies, but protocols should still be interpreted in the context of patient age, fracture stability, and soft tissue healing [19,20].
Common rehabilitation exercises include:

- Wrist flexion and extension
- Pronation and supination
- Grip-strength exercises
- Dexterity training
- Light functional activities

Low-resistance strengthening can start with therapy putty, foam balls, elastic resistance bands, and light household objects. In elderly patients, resistance is increased gradually and kept within pain tolerance. Functional outcomes after distal radius fractures remain variable, especially in patients with unstable fractures or advanced age [11,21].
In some elderly patients, functional improvement remains visible even several months after radiographic healing. Mild residual stiffness is relatively common, particularly in patients with preexisting degenerative changes. Pain during rehabilitation should be monitored carefully. Excessively aggressive mobilization may increase discomfort and reduce adherence to therapy.
As presented in Table 1, rehabilitation usually progresses gradually from edema control toward restoration of functional independence.

Table 1. Simplified Rehabilitation Progression According to Individual Recovery Phases

Rehabilitation phase	**Main goals**
Immobilization period	Edema reduction, maintenance of finger mobility, pain control
Early mobilization	Restoration of wrist range of motion
Intermediate recovery	Restoration of grip strength, improvement of fine motor skills
Functional recovery	Return to daily activities and improvement of functional independence

This progression works best when it is matched to pain tolerance, frailty, baseline mobility, and the patient's real daily needs.
Functional recovery is also monitored with tools such as DASH, QuickDASH, and PRWE, which translate wrist symptoms into practical information about disability and daily hand use [22].

Home Exercise and Supervised Physiotherapy

The optimal rehabilitation model is still debated. Uncomplicated distal radius fractures often recover well with a clear home exercise program, while therapist-supervised rehabilitation is most valuable when recovery is slow, painful, or functionally limiting. Current evidence does not justify intensive supervised therapy for every patient after distal radius fracture [23-27].
Home-based rehabilitation is practical in elderly patients with:

- Transportation difficulties
- Limited access to rehabilitation services

- Uncomplicated fracture patterns
- Relatively low functional demands

Written instructions and planned follow-up improve adherence, especially when patients are uncertain how much movement is safe. Supervised physiotherapy is better reserved for persistent stiffness, edema, weakness, or fear of movement after immobilization. Frailty, comorbidities, motivation, and transport problems often decide the real intensity of rehabilitation more than the fracture classification itself.

Selection of Patients for Supervised Physiotherapy

A single pathway does not fit the elderly population. Some patients need only clear instructions and reassurance. Others need close supervision because frailty, persistent symptoms, or loss of independence turns a wrist fracture into a wider functional problem.

Referral to supervised physiotherapy is particularly justified when the patient presents with:

- Persistent edema after immobilization
- Marked limitation of wrist range of motion
- Significant reduction in grip strength
- Impaired manual dexterity
- Fear of movement or reinjury
- Frailty syndrome
- Cognitive impairment affecting exercise adherence
- Difficulties performing activities of daily living

In patients with multiple comorbidities, independence matters more than maximal wrist mobility. The goals are practical: hygiene, dressing, food preparation, medication handling, and safe use of walking aids. Occupational therapy has a clear role when hand dysfunction directly limits these tasks.

Complex Regional Pain Syndrome and Other Complications

Complex regional pain syndrome (CRPS) is one of the complications that clinicians cannot afford to miss after distal radius fracture. It is relatively uncommon, but when it occurs, it can dominate the whole recovery process and markedly reduce quality of life.

Clinical manifestations may include:

- Disproportionate pain
- Edema
- Skin hypersensitivity
- Vasomotor abnormalities
- Reduced range of motion
- Impaired hand function

Early recognition matters. A patient with disproportionate pain, hypersensitivity, swelling, and avoidance of hand use needs reassessment rather than reassurance alone. Gentle mobilization, pain control, gradual functional activity, and interdisciplinary rehabilitation form the practical basis of management.

Other problems are less dramatic but more common: prolonged stiffness, tendon irritation, weakness, fear of movement, and loss of confidence during everyday tasks. Osteoporosis, sarcopenia, inactivity, and preexisting degenerative disease can slow recovery even when the fracture itself heals without difficulty.

Home Exercise Protocols and Functional Rehabilitation

Home exercise is the backbone of rehabilitation after cast removal or surgical stabilization. In uncomplicated fractures, a short and understandable program can restore useful function without frequent outpatient visits.

A baseline home rehabilitation protocol can include:

- Active wrist flexion and extension exercises
- Forearm pronation and supination training
- Finger mobility exercises
- Grip strengthening using foam balls or therapy putty
- Gradual return to light household activities

Progression must be gradual and pain controlled. Too much load too early increases discomfort and discourages exercise. Written instructions, demonstration, and follow-up visits are essential for patients who lack confidence or fear reinjury.

Fall prevention belongs in the same conversation. Education about safe mobility, home hazards, footwear, vision, balance, and medication review can reduce the risk of another injury after a fragility fracture.

Recovery is smoother when the treating team gives consistent advice. The surgeon defines mechanical restrictions, the therapist guides exercise progression, and the primary care physician addresses osteoporosis, analgesia, comorbidities, and fall risk. Older patients with complex needs benefit most from this shared approach.

Patients need clear instructions on when to seek earlier reassessment. Increasing pain, new numbness, progressive swelling, marked color or temperature changes, wound problems after surgery, or inability to move the fingers should not be ignored. Clear safety instructions reduce anxiety and help prevent delayed recognition of complications.

A practical follow-up visit includes inspection of edema and skin condition, finger mobility, wrist flexion and extension, forearm rotation, grip observation, and discussion of daily activities. Formal dynamometry is helpful when available, but basic outpatient care can still rely on functional questions. Difficulty with dressing, cooking, writing, or using a phone often tells the clinician more than a single range-of-motion value.

In outpatient practice, management can be organized around a small number of repeated questions. Is pain decreasing? Is swelling improving? Is finger motion preserved? Is wrist motion gradually increasing? Is the patient using the hand in daily activities? Is there any sign of disproportionate pain or hypersensitivity? These questions are simple, but they help identify patients whose recovery is not following the expected course.

Practical Outpatient Recommendations

Comorbidities also matter. Diabetes mellitus is associated with stiffness and slower tissue recovery. Osteoarthritis limits the final range of motion. Neurological disease affects coordination and grip control. Osteoporosis is relevant not only to the index fracture but also

to prevention of the next one. Geriatric rehabilitation must connect wrist recovery with broader musculoskeletal health and fall prevention.

Cognitive impairment complicates rehabilitation. Patients may forget exercises, misinterpret pain, or miss warning signs. Written instructions, visual materials, caregiver participation, and simplified routines improve safety. When impairment is substantial, independent home exercise alone is rarely enough.

Frailty may affect both the pace and goals of recovery. Frail patients may tolerate pain poorly, fatigue quickly during exercise, and require more repetitions of instruction. They may also be at higher risk of losing independence after even a relatively minor upper limb fracture. In these patients, rehabilitation should focus on essential tasks such as hygiene, dressing, safe transfers, meal preparation, and use of assistive devices. The wrist should be treated as part of the patient's broader functional system.

Older patients with distal radius fractures are not a uniform group. Some remain physically active and independent, while others are frail, dependent on caregivers, or limited by multiple chronic diseases. Rehabilitation planning should therefore consider baseline function, cognitive status, hand dominance, social support, and the patient's usual daily activities. A retired but active patient who cooks, drives, and lives independently may have different rehabilitation needs than a nursing-home resident with limited mobility.

Geriatric-Specific Rehabilitation Considerations

Motivation and social support may modify outcomes. Patients living alone, those with depressive symptoms, or individuals with poor understanding of the treatment plan may require more frequent follow-up. A short, realistic exercise plan is usually more effective than a complex program that is not followed. In this sense, adherence is not only a patient responsibility but also a measure of whether the rehabilitation plan is understandable and feasible.

Fear of falling matters. A distal radius fracture often follows a fall, and some older patients reduce their activity afterward. That response is understandable, but harmful: less activity worsens balance, strength, and independence. When broader mobility problems are present, rehabilitation cannot stop at the wrist. Home-hazard review, appropriate footwear, balance training, and medication review become part of fracture recovery.

Psychological Factors, Kinesiophobia, and Confidence in Hand Use

Kinesiophobia requires direct discussion. Patients need to hear a clear message: controlled movement is part of recovery and does not mean damaging the healing fracture. Small tasks come first - touching the thumb to each finger, holding a light object, turning a door handle, or using cutlery. These tasks rebuild confidence without overwhelming the patient.

Psychological factors shape recovery after distal radius fracture. Some older patients avoid the injured hand because they fear reinjury, persistent pain, or another fall. Avoidance can continue after radiographic healing and then becomes part of the problem: stiffness increases, grip remains weak, and normal hand use is delayed. In the clinic, this often appears as a protected wrist, reluctance to grasp objects, or near-total reliance on the opposite hand.

Rehabilitation After Conservative Treatment and Surgical Fixation

Conservatively treated patients often present with more pronounced post-immobilization stiffness. Surgically treated patients can sometimes start controlled motion earlier, but they also need attention to scar sensitivity, edema, wound healing, and gradual return of function. Both groups commonly show delayed grip recovery. The fixation method matters, but it does not replace patient-specific progression.

Evidence comparing operative and nonoperative treatment in older adults shows that better radiographs after surgery do not automatically produce a large long-term functional advantage for every elderly patient [12,13]. Rehabilitation success is therefore measured through pain, mobility, grip function, confidence, and independence. The plan follows the patient, not only the X-ray.

After volar locking plate fixation, earlier controlled movement is possible in selected cases, depending on fracture stability, soft-tissue condition, wound healing, and the surgeon's protocol. Early mobilization is not the same as unrestricted loading. Patients must understand the difference between gentle motion, functional use, and resisted activity. This distinction is especially important in osteoporosis or reduced protective sensation.

Rehabilitation pathways differ depending on whether the fracture was treated with cast immobilization or surgical fixation. After conservative treatment, stiffness is often related to the duration of immobilization and reduced use of the hand during the healing period. Mobilization may therefore begin with relatively limited wrist motion, and patients may initially experience discomfort during simple tasks. Education is important because some patients assume that pain after cast removal means that the fracture has not healed properly.

Detailed Home Exercise Progression

Progression works best when it follows tolerance rather than a rigid timetable. A patient with persistent edema, high pain sensitivity, or reduced confidence needs slower progression, whereas a physically active older adult may tolerate earlier functional tasks. For many patients, the target is not maximal grip strength but safe and comfortable use of the hand in daily life. This practical objective deserves explanation early in the rehabilitation process.

After the first phase of mobilization, low-resistance strengthening can be introduced gradually. Therapy putty, a soft foam ball, a rolled towel, or light elastic resistance are useful tools. In frail patients, even functional tasks such as holding a cup, folding towels, buttoning clothes, or preparing a simple meal can become graded therapeutic activity. This is often more meaningful than isolated strengthening, because it connects rehabilitation directly with daily life.

A practical early home program includes active wrist flexion and extension, forearm pronation and supination with the elbow supported, tendon-gliding exercises for the fingers, and gentle opening and closing of the hand. Exercises work best when performed slowly, with attention to movement quality rather than speed. The patient should understand that mild stretching discomfort is expected, but sharp pain, progressive swelling, or increasing night pain requires reassessment.

A home program must be simple enough to perform without continuous supervision and structured enough to prevent prolonged underuse of the hand. In the first days after cast removal or permission for mobilization, exercises emphasize active range of motion rather than resistance. Short sessions repeated several times per day are usually easier for older patients than one long session. This approach lets the patient observe the wrist response and stop before excessive pain or swelling develops.

Pain Control, Edema Monitoring, and Safe Loading

Medication issues require attention in older adults. Analgesics must be considered in the context of renal function, gastrointestinal risk, anticoagulant therapy, cognitive status, and fall risk. This review does not provide pharmacological recommendations, but inadequate analgesia and adverse drug effects both interfere with rehabilitation. Communication between the treating physician, primary care provider, and physiotherapist improves safety and adherence.

Safe loading should be introduced gradually. Early rehabilitation usually emphasizes active movement without external load. Later, the patient may progress to light gripping, household tasks, and resistance exercises. Heavy lifting, forceful pushing, and weight-bearing through the wrist should be delayed until clinically appropriate, especially after conservative treatment or in osteoporotic bone. Clear advice regarding loading is useful because elderly patients may either avoid the hand excessively or resume demanding activity too early.

Edema should be monitored throughout recovery rather than only during the immobilization phase. Persistent swelling may limit tendon gliding, reduce finger motion, and make strengthening exercises more difficult. When edema remains prominent, rehabilitation should return temporarily to active finger motion, elevation, gentle functional use, and compression if tolerated. More aggressive strengthening is usually postponed until swelling is better controlled.

Non-pharmacological pain management remains part of daily care. Elevation, short exercise sessions, pacing of activity, and avoidance of prolonged dependent positioning reduce discomfort related to swelling. Warm water immersion or gentle hand movement before exercise helps some patients start moving. Heat requires caution in sensory impairment or vascular disease. Cold application can reduce short-term pain or swelling, but excessive cooling is unpleasant and may discourage finger motion.

Pain control and adherence are inseparable. If pain is poorly controlled, older patients avoid movement, sleep poorly, and lose confidence in exercise. Complete comfort is not a realistic target during early mobilization. The useful message is simpler: mild exercise discomfort can be acceptable; increasing pain, swelling, numbness, or hypersensitivity needs reassessment.

Patient Education and Adherence to Rehabilitation

Patient education is often the difference between a good plan and a plan that is never performed. In older patients, instructions influence adherence, confidence, and safe use of the injured hand. Many elderly individuals do not know how much movement is safe after cast removal or surgery. Some avoid the hand for weeks; others load it too early.

Clear communication covers three points: the expected recovery timeline, the difference between acceptable discomfort and concerning pain, and the need for regular low-intensity exercise. Written instructions are useful because many patients forget verbal recommendations given during short visits. Demonstration works even better.

Family members and caregivers often determine whether the rehabilitation plan actually happens at home. In frail elderly patients, they help with exercise reminders, observation of swelling or pain, and safe performance of daily tasks. This support is especially relevant in mild cognitive impairment, poor vision, reduced dexterity, or previous falls.

Pain, fear of reinjury, low motivation, depression, transportation problems, and misunderstanding of the rehabilitation plan all reduce adherence. These barriers need to be identified during follow-up visits. A simple home program that the patient actually performs is more valuable than a complex protocol that is not understood or followed.

Follow-Up and Reassessment During Recovery

Recovery after distal radius fracture is rarely perfectly linear. Some patients regain function quickly after immobilization, while others struggle with swelling, stiffness, or weak grip for months. Follow-up identifies delayed recovery before it becomes accepted as normal.

Clinical reassessment includes pain, edema, wrist range of motion, finger mobility, grip strength, and activities of daily living. DASH, QuickDASH, and PRWE add useful patient-reported information, but they do not replace clinical examination or patient-specific goals.

Warning signs deserve attention: increasing pain, progressive stiffness, persistent edema, sensory disturbance, marked weakness, or symptoms suggesting CRPS. After surgery, tendon irritation, hardware-related discomfort, and wound problems also need to be considered.

In elderly patients, follow-up cannot stop at wrist angles. Dressing, meal preparation, hygiene, safe use of walking aids, and fall prevention are often more important than a few additional degrees of motion. Practical follow-up asks what the patient can actually do at home.

Barriers to Rehabilitation in Older Adults

Older patients face barriers that do not appear on the radiograph but strongly influence recovery. Frailty, low baseline activity, transportation problems, social isolation, visual or hearing impairment, and financial limitations can all reduce access to effective rehabilitation.

Comorbidities such as diabetes mellitus, rheumatoid arthritis, osteoarthritis, neurological disease, or previous upper limb injury may also slow functional recovery. Pain perception and rehabilitation tolerance may differ between patients, and some individuals require a slower progression than standard protocols suggest.

Access to supervised physiotherapy is limited in many settings. Home programs, teleconsultation, caregiver-assisted exercise, and periodic reassessment provide a practical compromise. They do not replace formal rehabilitation in complex cases, but they are often enough for uncomplicated fractures.

Psychological barriers are just as real as physical stiffness. Fear of pain, fear of falling, and low confidence in the injured limb delay return to normal activity. Some patients interpret stiffness as evidence that movement is harmful. Reassurance alone is rarely enough; graded functional exposure is more effective.

A realistic plan includes more than exercises. It also accounts for living conditions, caregiver support, cognition, transport, and the patient's ability to follow instructions. That broader view is the core of geriatric orthopedic rehabilitation.

Clinical Implications

Several practical points follow from the available evidence and clinical experience:

- Avoid unnecessary prolongation of immobilization
- Prioritize practical daily function over perfect wrist motion
- Use simple home exercise programs for uncomplicated fractures
- Reassess persistent edema or pain
- Expect recovery to continue for several months after fracture healing

For many elderly individuals, independence in daily activities is more important than full wrist mobility. Satisfactory recovery is possible even when a mild range-of-motion limitation persists.

Final success is not measured only on the radiograph. It is measured when the patient can dress, prepare food, use the hand safely, and return to basic daily activities.

For outpatient clinicians, the most useful practical approach is to define a small number of patient-specific functional goals at each stage of recovery. These goals can include independent hygiene, safe meal preparation, ability to use a phone, handwriting, use of public transportation, or safe handling of walking aids. Such goals are easier for elderly patients to understand than abstract targets such as complete restoration of range of motion. They also help the clinician decide whether rehabilitation should continue as home exercise, supervised physiotherapy, or occupational therapy focused on daily activities.

Limitations

This paper represents a non-systematic narrative review and does not provide formal evidence synthesis. Included studies varied in methodology and rehabilitation protocols. Some recommendations discussed in this article reflect commonly accepted clinical practice in addition to published evidence.

This review focused on practical rehabilitation issues rather than detailed surgical decision-making or radiographic classification systems. The conclusions therefore represent educational guidance rather than a formal clinical guideline.

Conclusion

Rehabilitation is a central part of treatment after distal radius fracture in elderly patients. Fracture union alone does not restore independence. Recovery also requires mobility, confidence, grip function, and return to daily hand use. In frail patients, functional independence outweighs anatomical perfection. The most effective approach is usually gradual, practical, and adapted to the patient's baseline function rather than driven by a rigid protocol.

Further studies are needed to define the best intensity of rehabilitation and to standardize home-based strategies for elderly patients. Frail geriatric populations deserve particular attention, because their goals, tolerance, and barriers differ from those of younger and healthier adults.

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Author Contribution Statement

Conceptualization, P.J. and K.J.K.; methodology, P.J. and K.Z.; literature review, P.J., M.D., K.B., M.C., M.K., J.S., A.C., W.R.B.-S.; writing – original draft preparation, P.J., K.J.K., and K.Z.; writing – review and editing, all authors; supervision, K.Z.; project administration, P.J. All authors have read and agreed to the final version of the manuscript.

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