Distal Radius Fracture Clinical Practice Guidelines—Updates and Clinical Implications

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The American Academy of Orthopaedic Surgeons and the American Society for Surgery of the Hand released updated Clinical Practice Guidelines in 2020 on the evaluation and treatment of acute distal radius fractures. Following a rigorous methodology designed and implemented through the AAOS, 7 guidelines based upon the best available evidence were released to assist surgeons and physicians managing distal radius fractures. These guidelines can serve as a reference for surgeons when managing patients with distal radius fractures. We review the evidence behind each guideline and highlight the practical implications of each guideline on care. *(J Hand Surg Am. 2021;46(9):807–811. Copyright © 2021 by the American Society for Surgery of the Hand. All rights reserved.)*

Key words Clinical decision-making, clinical practice guidelines, distal radius fracture, surgical fixation, wrist fracture.

ACCOUNTING FOR APPROXIMATELY 18% of fractures in patients 65 years and older, distal radius fractures are among the most commonly occurring fractures.[1,2] These fractures have an annual incidence of >640,000 in the United States[3] and cost approximately $170 million in 2007 from Medicare claims alone.[4] Because evidence demonstrates that the incidence of distal radius fractures continues to increase for all age groups[2] and will continue to pose a great burden to society, the American Academy of Orthopaedic Surgeons and the American Society for Surgery of the Hand collaborated on the development of an updated Clinical Practice Guideline (CPG).[5] The purpose of the CPG is to guide and improve the treatment of distal radius fractures and to help reduce practice variation based upon the best evidence currently available. The CPG was written with input from multiple stakeholder groups, including representatives from the Hand Surgery Quality Consortium, the Orthopaedic Trauma Association, the American College of Surgeons, the American Society of Plastic Surgeons, the American Association for Hand Surgery, and the American Society of Hand Therapists.

The development of such guidelines follows a standardized and rigorous process to minimize bias and enhance transparency. This process includes a multidisciplinary work group consisting of surgeons, therapists, and data analysts who systematically review the available literature designed to answer common and specific questions. This process follows strict methods, seeking the highest quality and most recent literature. For example, studies with fewer than 20 patients per group, <50% follow-up, or studies published in or prior to 2000 were excluded. The guidelines included reviewing more than 7,100 abstracts and more than 830 full-text articles to develop 6 recommendations supported by 82 research articles meeting stringent inclusion criteria. One guideline is a consensus statement because no evidence was returned from the literature review. In this review, we

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examine the evidence behind and evaluate the practical implications of each guideline.

GUIDELINES

Inconsistent evidence suggests no difference in outcomes between use of arthroscopic assistance and no arthroscopic assistance when treating patients for distal radius fractures (moderate strength)

The guideline evaluating the use of arthroscopic assistance for assessment of the articular surface during operative treatment of distal radius fractures has been updated from limited evidence in support of its use to moderate evidence not in support of its use. This guideline was informed by 1 high- and 2 moderate-strength studies. The strongest of the 3 studies is a randomized controlled trial evaluating the functional and radiographic outcomes after distal radius fractures were treated with a volar locked plate randomized to fluoroscopically-guided or arthroscopically-guided reduction.[6] This study demonstrated no difference in outcomes at 48 months between the cohorts. One moderate-quality study corroborated this and a second demonstrated that some radiographic outcomes could be improved with the use of arthroscopic evaluation. This recommendation is not meant to abolish the practice of arthroscopic assistance when treating distal radius fractures, but to serve as a guide to inform routine practice based on evidence.

While the authors do not routinely utilize wrist arthroscopy to guide reduction, we recognize there may be instances that were not specifically studied in the included literature (eg, radial styloid fracture reduction, in which the intra-articular fracture line may not be easily evaluated with fluoroscopy) in which surgeons may find arthroscopy helpful. Surgeons may utilize arthroscopy to evaluate and/or treat concomitant soft tissue injuries; however, the evidence does not support routine wrist arthroscopy. While associated soft tissue injuries (eg, scapholunate [SL] ligament) are reported with a high incidence,[7,8] a 2021 study evaluating differences in outcomes between patients with a radiographically apparent SL ligament injury and those without demonstrated no difference in outcomes.[9] This supports the notion that while these injuries may be present, addressing them via repair or reconstruction at the time of distal radius fracture treatment does not have an impact on outcomes. If a quality measure were constructed based on this moderate strength guideline, it would identify high utilizers of concomitant arthroscopy with distal radius fractures beyond a benchmark: for example, a surgeon billing for wrist arthroscopy 90% of the time they fix a distal radius fracture.

Inconsistent evidence suggests no difference in outcomes between a home exercise program and supervised therapy following treatment for distal radius fractures (limited strength)

Similar to the prior guideline, the 2020 iteration demonstrates that the evidence to support the use of a home exercise program or supervised therapy after an operatively or nonoperatively treated distal radius fracture remains limited, with inconsistent evidence suggesting that there is no difference in outcomes between a home exercise program and supervised therapy. Few studies met the inclusion criteria, and even those that did had important limitations. These shortcomings (eg, bias, variability in age and injury severity) highlight that perhaps some subsets of patients may benefit from supervised hand therapy, while others may not. Importantly, cost-effectiveness and resource utilization studies are needed to understand the utility of supervised therapy. The spirit of this guideline is not meant to eliminate the use of supervised therapy after distal radius fractures. However because the incidence of therapy after distal radius fractures (and other common hand procedures) is on the rise and variability in its use is noted, this guideline informs surgeons and therapists that routine supervised therapy after distal radius fractures may not be better than a home exercise program for all patients.[10] Some patients may benefit from a supervised therapy program. While the panel does not advocate for, nor is there evidence to support, the elimination of supervised therapy after distal radius fractures, future research is needed to address which patients and/or coexisting contextual factors indicate that supervised therapy may be beneficial.

Moderate evidence supports that for nongeriatric patients (most commonly defined in studies as those under 65 years of age), operative treatment for fractures with postreduction radial shortening >3 mm, dorsal tilt >10°, or intra-articular displacement or step off >2 mm leads to improved radiographic and patient-reported outcomes (moderate strength)

Strong evidence suggests that operative treatment for geriatric patients (most commonly defined in studies as those 65 years of age and older) does not lead to improved long-term patient-reported outcomes compared to nonoperative treatment (strong strength)

The 2020 iteration of the CPG for distal radius fractures includes 2 recommendations discussing surgical indications. While the prior guideline utilized 55 years of age as a cutoff, this iteration utilized 65

(ie, "geriatric patients [most commonly defined in studies as those 65 years of age and older]"). For nongeriatric patients, there is moderate evidence to support operative treatment for fractures with radial shortening >3 mm, dorsal tilt >10°, or intra-articular displacement or step off >2 mm after reduction, because it has been demonstrated to lead to improved radiographic and patient-reported outcomes. The strength of this recommendation is moderate, as it is supported by 1 high-quality and 26 moderate-quality studies. While this guideline aligns with the prior guideline, it has been updated with a cutoff of 65 years of age to define geriatric patients.

More critical is the guideline with strong evidence suggesting that operative treatment for geriatric patients does not lead to improved long-term patient-reported outcomes as compared to nonoperative treatment. While this guideline is based upon 2 high-quality and 11 moderate-quality studies and thus has a strong strength of recommendation, the panel acknowledges that age is a proxy for functional demand, which is likely to be more critical for surgical decision-making than age. For example, a 63-year-old unwell, low-functioning patient may be substantially different than a healthy, active 68-year-old patient with concomitant injuries (eg, carpal tunnel, lower extremity injuries) in terms of their preoperative functional demands, expected outcomes, and treatment choice. This surgical indication dilemma could be seen in the context of a similar paradox in the hip fracture literature.[11] Hemiarthroplasty is used for most femoral neck fractures: a majority (93%) of patients with femoral neck fractures receive a hemiarthroplasty. However, when surveying patients at risk for femoral neck fractures, the same number (93%) note they would prefer a total hip replacement. Three contributing factors may result in this misalignment: (1) the treatment decision can be a daunting task that requires understanding risks, benefits, and preferences that may be challenging for a patient who has just sustained a trauma, (2) financial incentives, and (3) "thinking too fast," a scheme coined by Daniel Kahenman, a Nobel Prize winner in Economics, in which "people employ 2 parallel decision-making processes, 1 which is fast and instinctive and 1 which is slower and more deliberate." The former reflects an emotional response and the second a more analytic method. When first meeting a patient (in the emergency room or in clinic), a surgeon may perceive a traumatized patient as having low function, which may lead to a hasty decision-making process. Previous research demonstrates that patients prefer taking an active role in the decision-making process[12–14] and that most older patients with distal radius fractures favor a shared decision-making approach to their care.[12,14] Therefore, using patient-centered and shared decision-making approaches and decision-making tools may help the care team (and the patient) understand the values, preferences, and functional demands of a patient and how they align with treatment options.[15–19] While the panel acknowledges that functional demand may be a better explanatory variable for aligning and discussing treatment options with a patient, this guideline is based on best available evidence, which utilizes an age cutoff.

As a quality measure, these guidelines could inform measurement of surgical and nonsurgical management of distal radius fractures in the geriatric patient. While the purpose of this guideline is not to limit treatment options for surgeons or patients, the specificity of these questions and the strength of evidence does allow for an evidence-based discussion with patients regarding their values and preferences regarding their care. Tools that facilitate conversations with patients regarding their values and preferences for treatment (eg, dealing with the risks of surgery) and outcomes (eg, accepting some loss of grip strength) can ensure each individual patient receives treatment appropriate for them.[20]

Limited evidence suggests no difference in outcomes based on frequency of radiographic evaluation for patients treated for distal radius fractures (limited strength)

In evaluating the utility of serial radiographs to follow acute distal radius fractures, no high-quality studies were identified. A moderate-quality, multicenter, randomized controlled trial investigating the impact of eliminating routine radiographs 2 weeks after a distal radius fracture (the control cohort received routine radiographs at 1, 2, 6, and 12 weeks after surgery) demonstrated that the cohort receiving radiographs at 2 weeks had minimal but statistically significant differences in range of motion at 1 year following treatment.[21] There was no difference in either the complication rate or patient-reported outcomes. Of note, patients in the study group received radiographs at 2 weeks if they experienced a new trauma, a spike in their pain, or a worsening neurovascular status. Similar to the utilization of postoperative, supervised therapy, this recommendation underscores patient-centered and value-based care. As radiographs have costs, future investigation of the cost-effectiveness and/or the long-term outcomes of eliminating serial or some radiographs will be useful.

Strong evidence suggests no significant difference in radiographic or patient-reported outcomes between fixation techniques for complete articular or unstable distal radius fractures, although volar locking plates lead to earlier recovery of function in the short term (3 months; strong strength)

When investigating specific methods for operative fixation, the 2020 CPG provides strong evidence that no difference exists in outcomes between fixation techniques for complete articular or unstable distal radius fractures. A caveat to this recommendation is that volar locked plates lead to earlier recovery of function in the short term (3 months). This recommendation was informed by 6 high-quality studies, with 3 comparing various fixation techniques for intra-articular fractures and 3 comparing various fixation techniques for unstable distal radius fractures. Based upon these guidelines, the panel recommends that distal radius fractures continue to be treated based upon patient-specific (eg, osteoporotic), context-specific (eg, polytraumatized), and fracture-specific (comminuted) factors. Appropriate use criteria have been created to help determine the appropriateness of a guideline as applied to a particular patient.[5] While this recommendation has evolved from its prior iteration, future studies addressing specific fracture patterns, cost-effectiveness, and longer-term complication profiles will improve the actionability of this guideline.

In the absence of sufficient evidence specific to distal radius fractures, it is the opinion of the workgroup that opioid-sparing and multimodal pain management strategies should be considered for patients undergoing treatment for distal radius fractures (consensus)

Given that there have been few studies evaluating and comparing postoperative pain medication regimens, the panel released a consensus statement that opioid-sparing and multimodal pain management strategies should be considered. This consensus is based on a low-quality study and the growing body of literature outside of distal radius fracture care supporting opioid-sparing protocols.[22–24] As there is great variation in opioid prescribing patterns after distal radius fractures and excess opioid prescribing is associated with greater and prolonged use, future studies addressing the effectiveness of nonopioid or opioid-sparing protocols are needed.[25–27] Additional work to identify not only effective nonopioid alternatives but also which patients may benefit the most from opioids will also be helpful.

SUMMARY

The updated CPG provides new guidance toward the management of distal radius fractures and also highlights opportunities for improved evidence to support practice. Importantly, these guidelines serve as recommendations to help inform practice and decrease variability, with the goal of improving quality of care. The panel recognizes that there are instances in which various recommendations may not apply to an individual patient. These recommendations should be understood and utilized in patient-, context-, and fracture-specific scenarios. A patient-centered approach should be taken for each individual patient, ensuring treatment aligns with their values and preferences.

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