Distal Radius Fractures

Outcomes-based Decision-making and its Implications for Surgery and Therapy

Greg Watchmaker, MD Liam More O'Ferral BS

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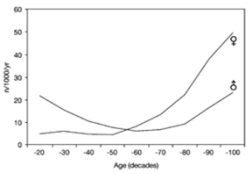
Incidence

Table 1 Fractures arranged in order of decreasing incidence

Fracture	*n*	%	$n/10^5$	Men: women
Distal radius	1044	17.5	195.2	31:69
Metacarpal	697	11.7	130.3	85:15
Proximal femur	692	11.6	129.4	26:74
Finger phalanx	574	9.6	107.3	68:32
Ankle	539	9.0	100.8	47:53
Metatarsal	403	6.8	75.4	43:57
Proximal humerus	337	5.7	63.0	30:70
Proximal forearm	297	5.0	55.5	46:54



Charles M. Court-Brown; Ben Caesar (2006). *Epidemiology of adult fractures: A review. , 37(8), 691–697.* doi:10.1016/j.injury.2006.04.130

.08/100,000/year

1.04/100,000 flight hours

195/100,000/yr

1000/100,000/year

2

Clinical Vignette #1

3

Clinical Vignette #1

Treatment Options

1. Cast
2. K-wire
3. External Fixator
4. ORIF with plate

4

Clinical Vignette #2

43 y.o. woman fell on her driveway 24 hours prior to presentation

5

Clinical Vignette #2

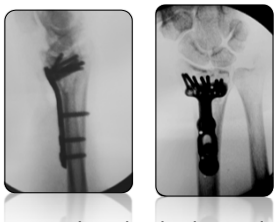
6

Clinical Vignette #3

Comminuted intra-articular volar shear fracture

7

Clinical Vignette #3



ORIF with volar locking plate

8

9

Clinical Vignette #3


80 y.o. retired gentleman 6 weeks post initial presentation for a comminuted distal radius fracture treated with cast immobilization. Feels no pain, is functional with ADLs and is starting a home program of exercises. Is this treatment and early outcome acceptable?

10

Clinical Vignette #3



Is this acceptable? Should ORIF have been performed?

11

Clinical Vignette #3



Is this acceptable?
38 deg flexion, 18 deg extension, 90 deg pronation, 15 deg supination

12

Clinical Vignette #3

Is this acceptable?

38° flexion, 18° extension, 90° pronation, 15° supination

44° flexion, 45° extension, 88° pronation, 53° supination

13

Clinical Vignette #3

Is this acceptable?

38° flexion, 18° extension, 90° pronation, 15° supination

44° flexion, 45° extension, 88° pronation, 53° supination

Uninjured: 41° flexion, 56° extension, 82° pronation, 58° supination

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Indications for Surgery

1. Radiographic findings indicating instability (pre-reduction radiographs best predictor of stability)
2. **Dorsal angulation > 5°** or > 20° of contralateral distal radius
3. Volar or dorsal comminution
4. **Displaced intra-articular fractures > 2mm**
5. **Radial shortening > 5mm**
6. Associated ulnar fracture
7. Severe osteoporosis
8. Articular margin fractures (dorsal and volar Barton's fractures)
9. Comminuted and displaced extra-articular fractures (Smith's fractures)
10. Die-punch fractures
11. Progressive loss of volar tilt and radial length following closed reduction and casting

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Clinical Vignette #4

54 y.o. healthy, active woman fell running.
Acceptable?

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Clinical Vignette #4

Indication #2 – Dorsal Inclination > 5 degrees

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Clinical Vignette #4

At 6 weeks post-injury
45° flexion, 44° extension, 90° pronation, 75° supination
Low level pain, starting a directed home program

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Indications for Surgery

1. Radiographic findings indicating instability (pre-reduction radiographs best predictor of stability)
2. **Dorsal angulation > 5°** or > 20° of contralateral distal radius
3. Volar or dorsal comminution
4. Displaced intra-articular fractures > 2mm
5. Radial shortening > 5mm
6. Associated ulnar fracture
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Exploring Levels of Evidence

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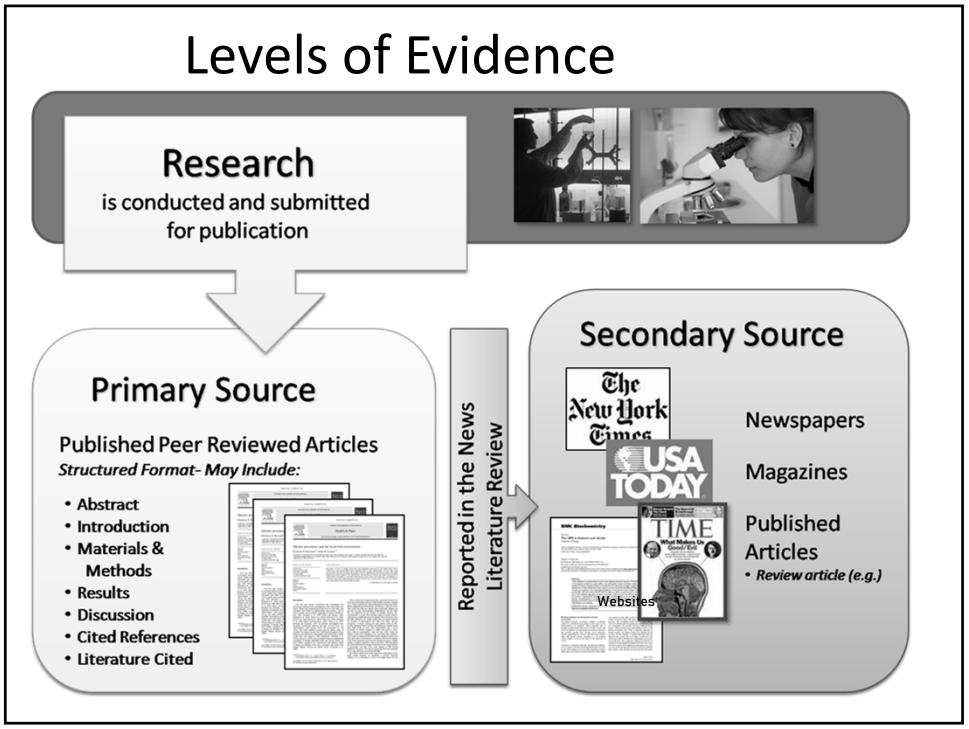
Levels of Evidence
Research
is conducted and submitted for publication
Primary Source
Published Peer Reviewed Articles
Structured Format- May Include:
• Abstract
• Introduction
• Materials & Methods
• Results
• Discussion
• Cited References
• Literature Cited
Reported in the News Literature Review
Secondary Source
The New York Times
USA TODAY
TIME
Websites
Newspapers
Magazines
Published Articles
• Review article (e.g.)

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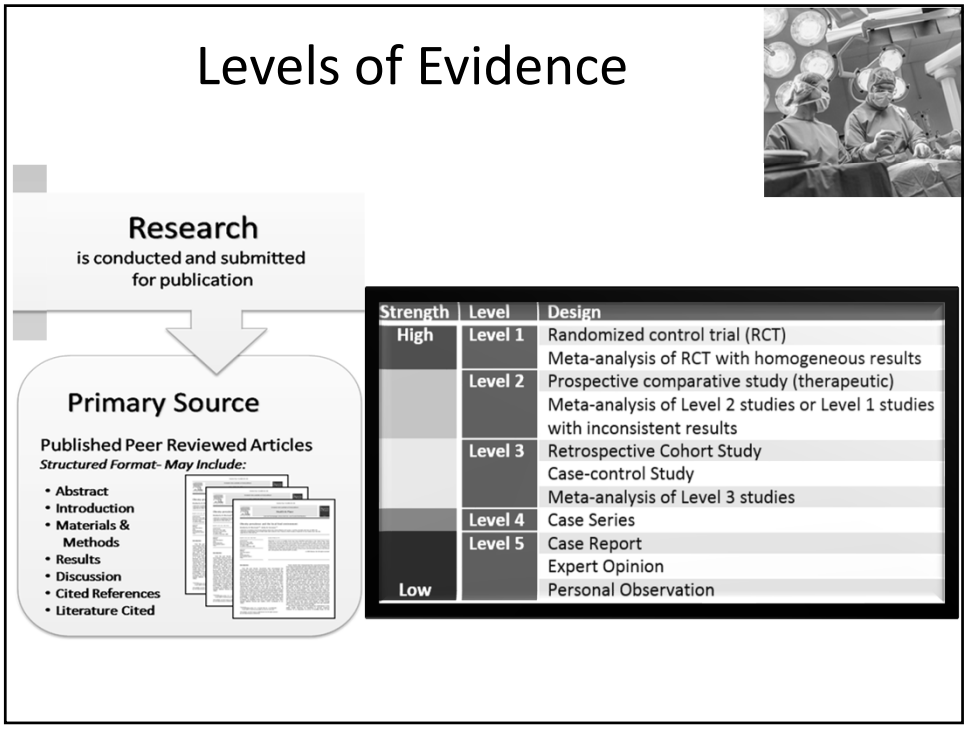
Levels of Evidence
Research
is conducted and submitted for publication
Primary Source
Published Peer Reviewed Articles
Structured Format- May Include:
• Abstract
• Introduction
• Materials & Methods
• Results
• Discussion
• Cited References
• Literature Cited
Strength | Level | Design
High | Level 1 | Randomized control trial (RCT)
Meta-analysis of RCT with homogeneous results
Level 2 | Prospective comparative study (therapeutic)
Meta-analysis of Level 2 studies or Level 1 studies with inconsistent results
Level 3 | Retrospective Cohort Study
Case-control Study
Meta-analysis of Level 3 studies
Level 4 | Case Series
Level 5 | Case Report
Expert Opinion
Low | Personal Observation

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Table 2

Educational Resources Used in Training (Respondents Could Select More Than One).

Resource	N (%)
Orthobullets	369 (99.5)
Systematic review/meta-analysis	342 (92.2)
Textbooks	334 (90.0)
Primary, focused research articles	325 (87.6)
Industry-sponsored events	250 (67.4)
VuMedi	249 (67.1)
Surgical atlases	231 (62.3)
In-person/recorded lectures	200 (53.9)
YouTube	196 (52.8)
Various websites	193 (52.0)
Wikipedia	132 (35.6)
Podcasts	41 (11.1)
Other	19 (5.1)
Blogs	12 (3.2)

The single most valued resource used among residents:
Orthobullets at 57.1%
Textbooks at 22.6%
Systematic review articles at 11%
Primary research articles at 5.9%

Rogers MJ, Zeidan M, Flinders ZS, Presson AP, Burks R. Educational Resource Utilization by Current Orthopaedic Surgical Residents: A Nation-wide Survey. J Am Acad Orthop Surg Glob Res Rev. 2019 Apr 30;3(4):e041. doi: 10.5435/JAAOSGlobal-D-19-00041. PMID: 31334477; PMCID: PMC6510462.

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Indications for Surgery

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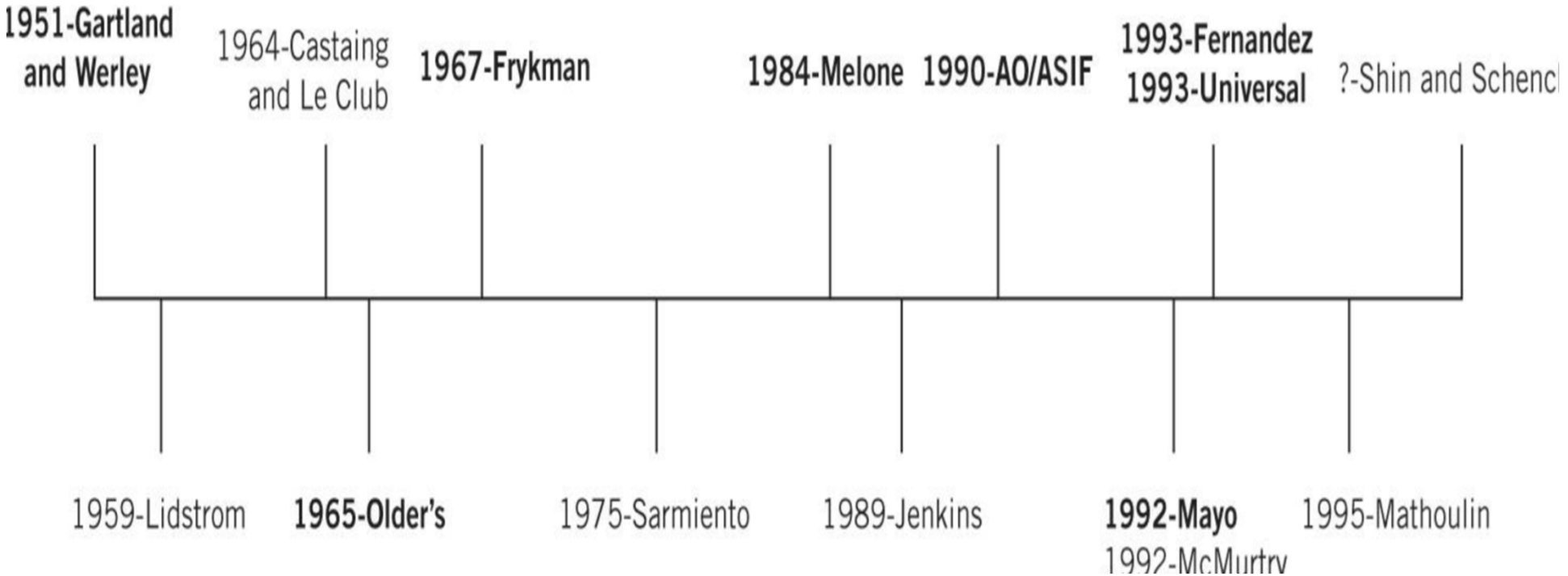
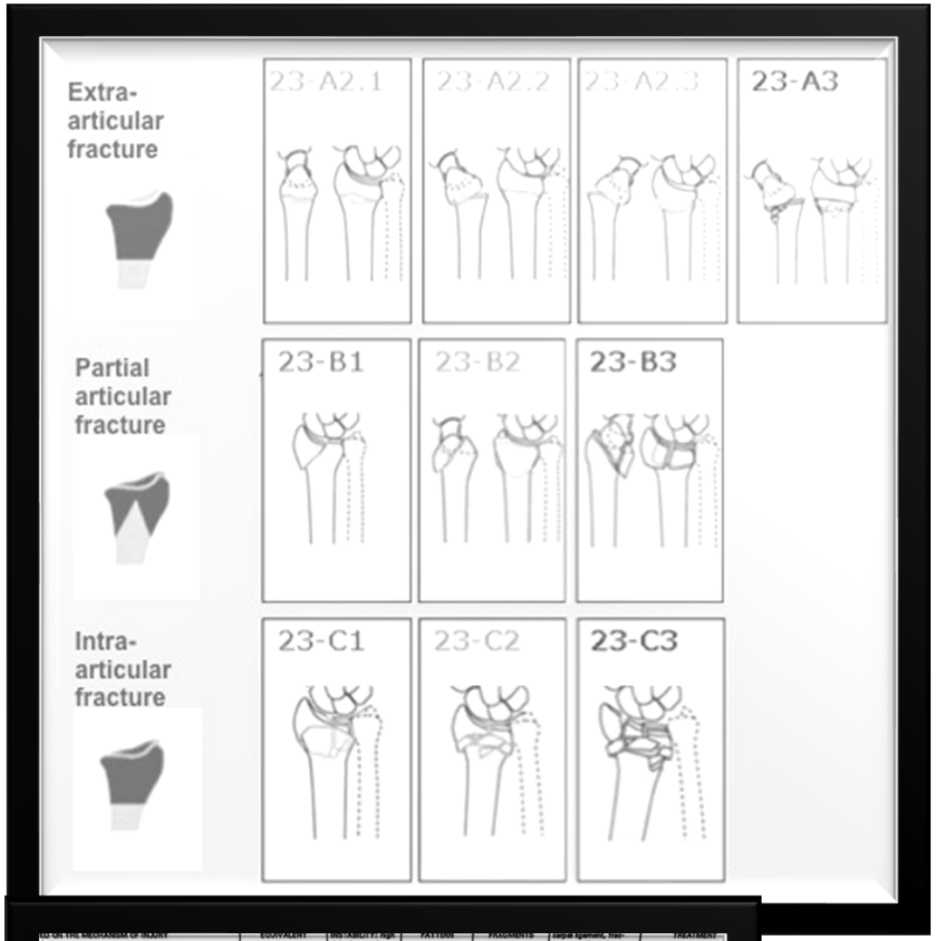
Radiographic Instability

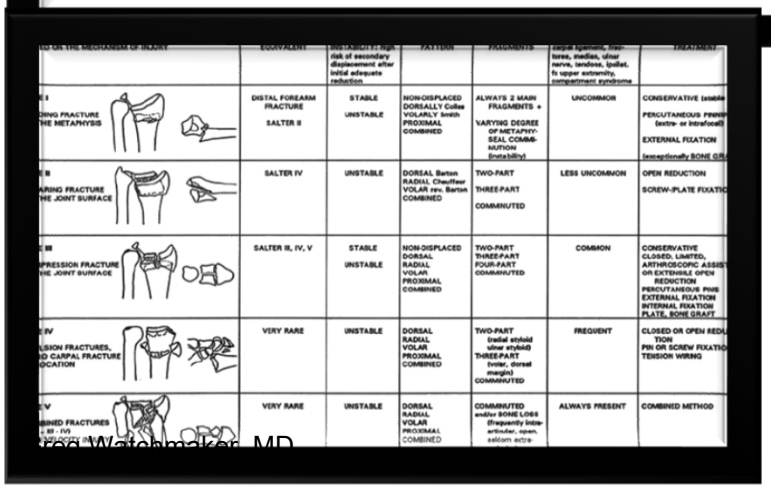
Fracture Pattern Classifications



Radiographic Instability

AO Fracture Pattern Classification Agreement





AO Distal Radius Fracture Classification: Global Perspective on Observer Agreement

Prakash Jayakumar, MBBS, MRCS,[1] Teun Teunis, MD,[1] Beatriz Bravo Giménez, MD,[2] Frederik Verstreken, MD,[3] Livio Di Mascio, MBBS, FRCSEd,[4] and Jesse B. Jupiter, MD[1]

By consensus, 27% (2,933) of the fractures were rated as type A, 24% (2,672) as type B, 47% (5,200) as type C, and 2% (235)

Type A fractures (0.68, 95% CI: 0.62–74)

Type C fractures (0.44, 95% CI: 0.37–0.52

Type B fractures (0.28, 95% CI: 0.23–0.35).

Pattern Classification - Utility

Ann R Coll Surg Engl. 2016 Nov; 98(8): 525–531. PMCID: PMC5392888
Published online 2016 Nov. doi: 10.1308/rcsann.2016.0237 PMID: 27513789

Adult distal radius fractures classification systems: essential clinical knowledge or abstract memory testing?

A Shehovych,[3] O Salar,[1,2] CER Meyer,[1,2] and DJ Ford[1,2]

"Sadly, on completion of this paper we have not found a distal radius fracture classification that proved to be useful. Failings range from poor reproducibility and reliability, and over-complexity… we would discourage trainees from spending time learning these classifications, as they serve not as essential clinical knowledge but more as forms of abstract memory testing."

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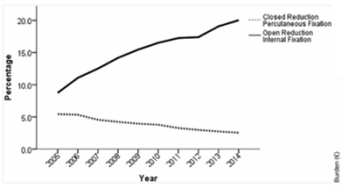
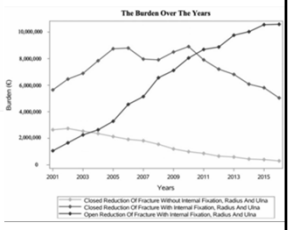
What's Practiced?



Azad A, Kang HP, Alluri RK, Vakhshori V, Kay HF, Ghiassi A. Epidemiological and Treatment Trends of Distal Radius Fractures across Multiple Age Groups. J Wrist Surg. 2019 Aug;8(4):305-311. doi: 10.1055/s-0039-1685205. Epub 2019 Apr 16. PMID: 31404224; PMCID: PMC6685779.



Longo UG, De Salvatore S, Mazzola A, Salvatore G, Mera BJ, Piergentili I, Denaro V. Colles' Fracture: An Epidemiological Nationwide Study in Italy from 2001 to 2016. Int J Environ Res Public Health. 2023 Feb 23;20(5):3956. doi: 10.3390/ijerph20053956. PMID: 36900966; PMCID: PMC10002201.

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The Road Not Taken

Two roads diverged in a yellow wood,
And sorry I could not travel both
And be one traveler, long I stood
And looked down one as far as I could
To where it bent in the undergrowth – Robert Frost

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Distal Radius Fractures

Surgery… what is the evidence?

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Evidence/Guidelines

JAMA 2020

Operative vs. Non-operative Treatment of Distal Radius Fractures in Adults: A Systematic Review and Meta-analysis (n=2254)

The overall pooled effect revealed that operative treatment was associated with a significant improvement in the medium-term DASH score compared with non-operative treatment meandiff= −5.22

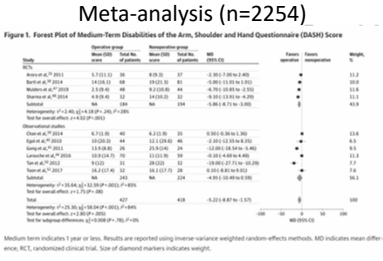

Figure 1. Forest Plot of Medium-Term Disabilities of the Arm, Shoulder and Hand Questionnaire (DASH) Score

Medium term indicates 1 year or less. Results are reported using inverse-variance weighted random-effects methods. MD indicates mean difference; RCT, randomized clinical trial. Size of diamond markers indicates weight.

Ochen Y, Peek J, van der Velde D, et al. Operative vs Nonoperative Treatment of Distal Radius Fractures in Adults: A Systematic Review and Meta-analysis. JAMA Netw Open. 2020;3(4):e203497. doi:10.1001/jamanetworkopen.2020.3497

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Evidence/Guidelines?

DASH Minimal Clinically Important Difference (MCID)

Franchignoni study result showed the lower boundary for a range of MCID values for DASH of **10.83** points and the QuickDASH of **15.91**

Ogura study using distribution-based methods, the minimal clinically important differences of the DASH questionnaire were **7.4 a**nd **8.3** by half standard deviation and the 90% interval of minimal detectable change, respectively.

Franchignoni F, Vercelli S, Giordano A, Sartorio F, Bravini E, Ferriero G. Minimal clinically important difference of the disabilities of the arm, shoulder and hand outcome measure (DASH) and its shortened version (QuickDASH). J Orthop Sports Phys Ther. 2014 Jan;44(1):30-9. doi: 10.2519/jospt.2014.4893. Epub 2013 Oct 30. PMID: 24175606.

Ogura K, Yakoub MA, Christ AB, Fujiwara T, Nikolic Z, Boland PJ, Athanasian EA, Healey JH. The critical difference in the DASH (Disabilities of the Arm, Shoulder, and Hand) outcome measure after essential upper extremity tumor surgery. J Shoulder Elbow Surg. 2021 Sep;30(9):e602-e609. doi: 10.1016/j.jse.2020.11.027. Epub 2021 Jan 20. PMID: 33484830; PMCID: PMC8289920.

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Recent Evidence/Guidelines?
AAOS/ASSH 2022

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

Strength of recommendation: Strong. ★★★★

Moderate evidence supports that for non-geriatric patients (most commonly defined in studies as under 65 years of age), operative treatment for fractures with post reduction radial shortening >3mm, dorsal tilt >10 degrees, or intraarticular displacement or step off >2 mm leads to improved radiographic and patient reported outcomes.

Strength of recommendation: Moderate. ★★★☆

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

Strength of recommendation: Limited. ★★☆☆

AAOS/ASSH Clinical Practice Guideline Summary Management of Distal Radius Fractures. J Am Acad Orthop Surg. 2022 Feb 15; 30(4): e480–e486. Dr. Robin Neil Kamal and Dr. Lauren Michelle Shapiro

Recent Evidence/Guidelines?

AAOS/ASSH 2022

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

Strength of recommendation: Strong. ★★★★

The guideline indicating strong evidence that operative fixation does not lead to improved long-term patient reported outcomes relative to non-operative treatment in geriatric patients is based upon two high quality studies and 11 moderate quality studies with most consistently demonstrating that while **radiographic parameters are improved** after surgical treatment, there is **no difference in patient reported outcomes**.

AAOS/ASSH Clinical Practice Guideline Summary Management of Distal Radius Fractures. J Am Acad Orthop Surg. 2022 Feb 15; 30(4): e480–e486. Dr. Robin Neil Kamal and Dr. Lauren Michelle Shapiro

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Then How to Decide….

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Patient Involvement in Decision-Making

Talk about appearances

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Patient Involvement in Decision-Making

Talk about appearances

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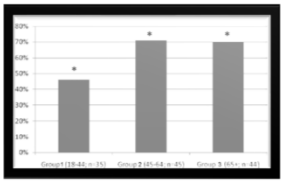
Patient Involvement in Decision-Making

Talk about appearances

Redisplacement post-reduction



Eric C. Makhni; Timothy J. Ewald; Sean Kelly; Charles S. Day (2008). Effect of Patient Age on the Radiographic Outcomes of Distal Radius Fractures Subject to Nonoperative Treatment. , 33(8), 0–1308.

39

Patient Involvement in Decision-Making

Talk about function




40

Patient Involvement in Decision-Making

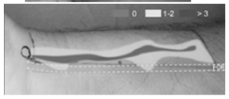
Talk about immobilization period

41

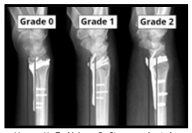
Patient Involvement in Decision-Making

Talk about risks





Tan, Valerie H et al. "Relation of Lateral Antebrachial Cutaneous Nerve to the Volar Approach to Distal Radius." The journal of hand surgery Asian-Pacific volume 21 1 (2016): 68-71 .



Vasara, H., Tarkiainen, P., Stenroos, A. et al. Higher Soong grade predicts flexor tendon issues after volar plating of distal radius fractures – a retrospective cohort study. BMC Musculoskelet Disord 24, 271 (2023)

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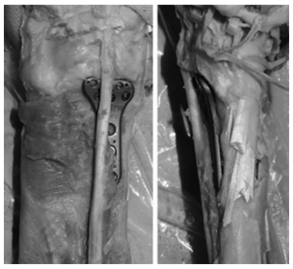
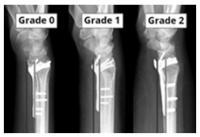
Patient Involvement in Decision-Making

Talk about risks



Sato, K., Kikuchi, Y., Mimata, Y. et al. Volar locking plates not touching the flexor pollicis longus tendon appear as prominences on radiographs: a cadaver study. J Orthop Traumatol 20, 29 (2019)



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Therapy for Distal Radius Fractures

Post-fracture therapy (choose all that apply)

1. Improve active range of wrist motion
2. Increase strength
3. Increase patient satisfaction, patient reported outcomes
4. Speed return to activities/work

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Therapy Visits per Distal Radius Fracture Patient

Never see 1 visit + HEP 2-4 visits 5-10 visits >10 visits

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Distal Radius Fractures

Therapy… what is the evidence?

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Evidence for Therapy Following DRF

Chung 2021

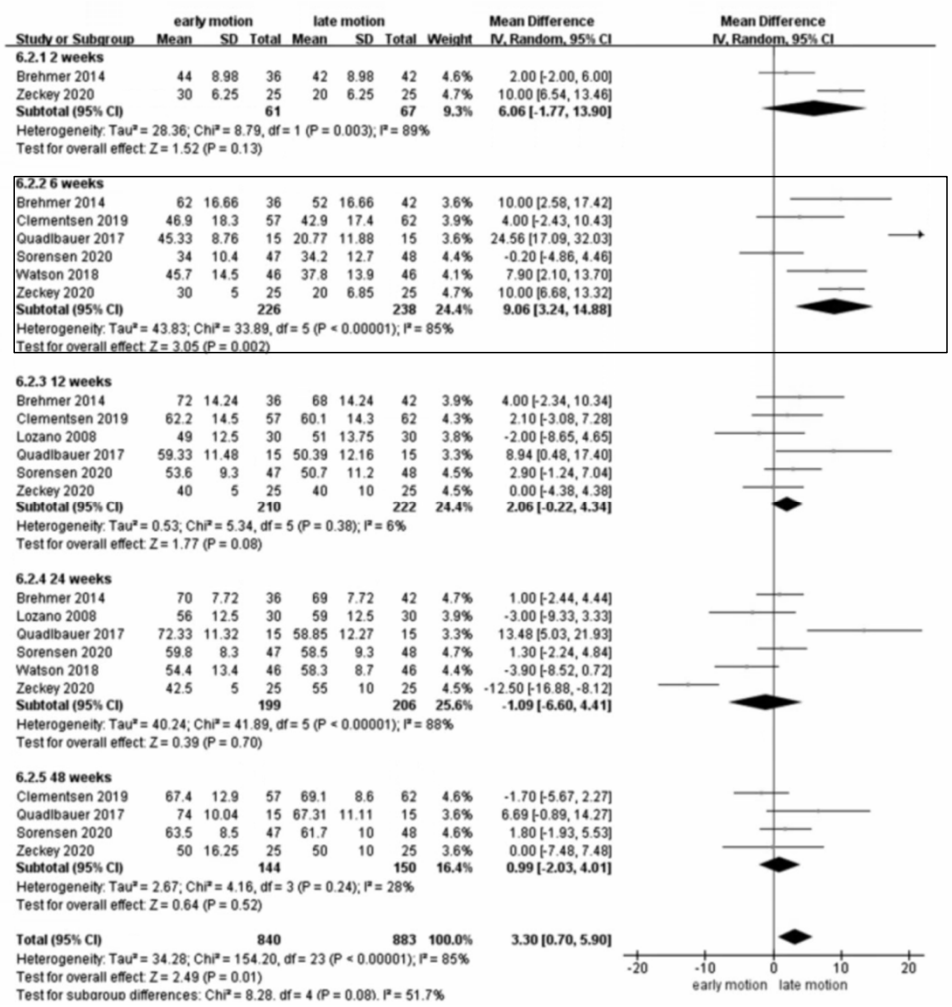
- Multi-center (N=268)
- Randomized trial of DRF treatment in patients age 60 years and older. Fracture severity equal between therapy and home-program patients.
- Mean of 9.2 supervised sessions over 14.2 weeks
- There were no differences in patient-reported outcomes between participants who underwent therapy and those who did not
- Participants who did not have therapy recovered more grip strength
- Participants who engaged in therapy for a shorter time reported greater function, ability to work, and satisfaction.

Unadjusted 12-month primary and secondary outcomes by therapy participation

	Any therapy	No therapy	p-value
MHQ[a]			
Summary	84 (79, 85)	82 (77, 87)	0.46
Pain	19 (16, 22)	20 (13, 26)	0.61
Function	77 (74, 81)	77 (71, 84)	0.73
ADL	85 (82, 88)	85 (78, 91)	0.60
Work	82 (78, 85)	81 (73, 90)	0.83
Aesthetics	84 (81,87)	86 (79, 92)	0.91
Satisfaction	77 (73, 81)	84 (77, 91)	
SF-36[b]			
Physical Component	47 (45, 49)	45 (40, 49)	0.32
Mental Component	55 (53, 56)	53 (49, 57)	0.69
Functional outcomes			
Grip strength, %	78 (75, 81)	87 (82, 92)	**0.03**
Key pinch strength, %	89 (85, 92)	87 (79, 94)	0.79
Flexion, %	85 (82, 88)	84 (76, 92)	0.88
Extension, %	92 (89, 94)	96 (87, 105)	0.85
Ulnar deviation, %	90 (84, 97)	82 (73, 92)	0.45
Radial deviation, %	98 (91, 105)	106 (92, 122)	0.13
Pronation, %	98 (96, 99)	97 (94, 100)	0.57
Supination, %	96 (93, 99)	97 (92, 102)	0.18
Complications			
Experienced any complications, n (%)	149 (69%)	32 (60%)	0.21
Experienced severe complications, n (%)	29 (13%)	8 (15%)	0.76
Experienced mild complications, n (%)	117 (54%)	27 (51%)	0.64

Chung KC, Malay S, Shauver MJ; Wrist and Radius Injury Surgical Trial Group. The Relationship between Hand Therapy and Long-Term Outcomes after Distal Radius Fracture in Older Adults: Evidence from the Randomized Wrist and Radius Injury Surgical Trial. Plast Reconstr Surg. 2019 Aug;144(2):230e-237e.

Evidence for Early Mobilization?



Forest plot showing 10deg greater extension at 6 weeks with early motion but at no other time period

2021 Meta-analysis

Early motion had statistically <u>better DASH scores</u> (10.15) at 3 and 6 weeks, however, 12 weeks and beyond no difference

Early motion patients required greater narcotic use to control pain

Early motion led to <u>hardware loosening</u> or fracture re-displacement more frequently with **RR of 3.00** (95% CI 1.02–8.83, *P* = 0.05)

In adults, early mobilization may be beneficial for distal radius fractures treated with open reduction and internal fixation: a systematic review and meta-analysis. ZhiBo Deng, JiangPing Wu, KaiYing Tang, Han Shu, Ting Wang, FuBing Li & Mao Nie. Journal of Orthopaedic Surgery and Research volume 16, Article number: 691 (2021)

Evidence for Early Mobilization?

Contents lists available at ScienceDirect

Journal of Hand Therapy

journal homepage: www.elsevier.com/locate/jht

Full Length Article

Comparison of immobilization periods following open reduction and internal fixation of distal radius fracture: A systematic review and meta-analysis

Abdullah A. Ghaddaf[a,b,*], Ahmed S. Abdulhamid[a,b], Mohammed S. Alomari[a,b], Mohammed S. Alquhaibi[a,b], Abdulaziz A. Alshehri[c], Mohammed S. Alshehri, MD[a,b,d]

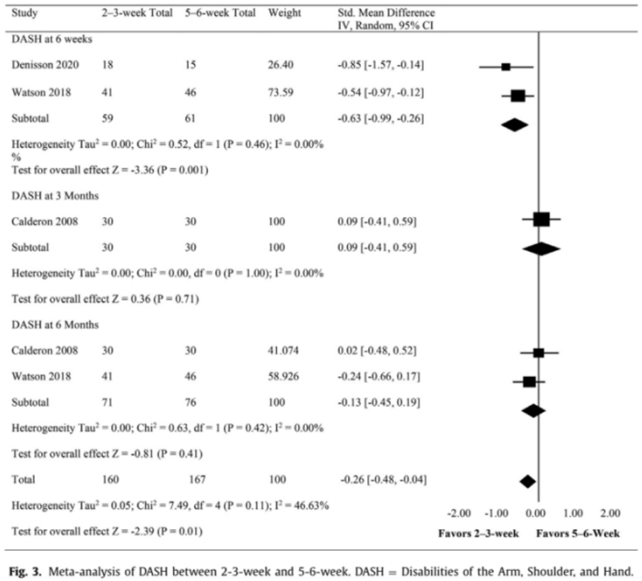


Fig. 3. Meta-analysis of DASH between 2-3-week and 5-6-week. DASH = Disabilities of the Arm, Shoulder, and Hand.

- Motion started at <=1 week, vs. 2-3 weeks, vs. 5-6 weeks showed improvement below the Meaningful Clinically Important Difference (MCID) for DASH and PRWE at 6 weeks
- Difference itself disappeared by 6 months

Ghaddaf AA, Abdulhamid AS, Alomari MS, Alquhaibi MS, Alshehri AA, Alshehri MS. Comparison of immobilization periods following open reduction and internal fixation of distal radius fracture: A systematic review and meta-analysis. J Hand Ther. 2023 Jan-Mar;36(1):23-32. doi: 10.1016/j.jht.2021.06.004. Epub 2021 Jul 23. PMID: 34304976.

Evidence for Therapy Following DRF

Rehabilitation for distal radial fractures in adults (Review)

Handoll HHG, Madhok R, Howe TE

THE COCHRA
COLLABORAT

This is a reprint of a Cochrane review, prepared and maintained by The Cochran
2002, Issue 2
http://www.thecochranelibrar

WILEY

2002 Cochrane Review

Main results

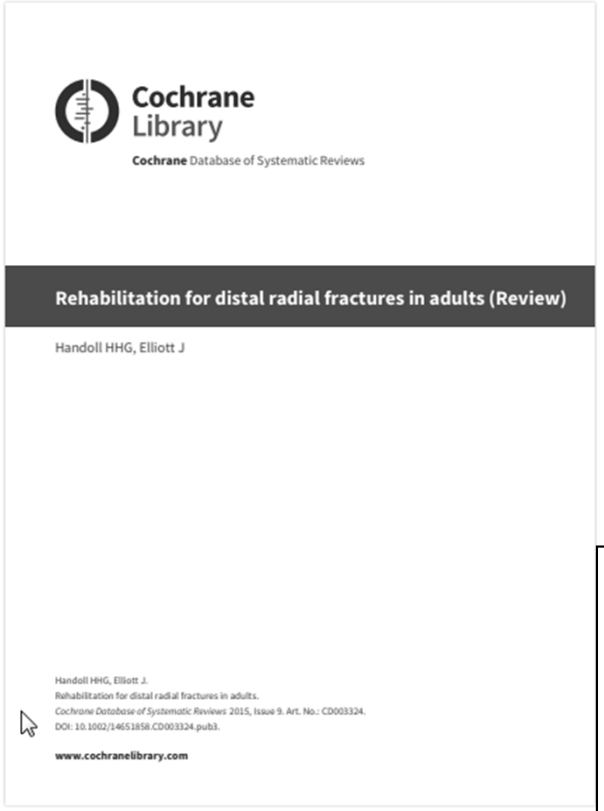
Twelve trials, involving 601 mainly female and older patients, were included. Initial treatment was conservative, involving plaster cast immobilisation, in all but 20 participants whose fractures were fixed surgically. Though some trials were well conducted, others were methodologically compromised. No trial provided definitive evidence. Only very limited pooling of results from comparable trials was possible.

For interventions started during immobilisation, there was weak evidence of improved hand function in the short term, but not in the longer term, for early occupational therapy (one trial), and of a lack of differences in outcome between supervised and unsupervised exercises (one trial).

For interventions started post-immobilisation, there was weak evidence of a lack of clinically significant differences in outcome in patients receiving formal rehabilitation therapy (three trials), passive mobilisation (two trials) or whirlpool immersion (one trial) compared with no intervention. There was weak evidence of a short-term benefit of continuous passive motion (post external fixation) (one trial), intermittent pneumatic compression (one trial) and ultrasound (one trial). There was weak evidence of better short-term hand function in participants given physiotherapy than in those given instructions for home exercises by a surgeon (one trial).

Handoll, H., Madhok, R., & Howe, T. (2002). Rehabilitation for distal radial fractures in adults. The Cochrane Database of Systematic Reviews (Protocol).

Evidence for Therapy Following DRF



2015 Cochrane Review (227 page report)

We included 26 trials, involving 1269 mainly female and older patients. For interventions started post-immobilisation, there was very low quality evidence from one study (47 participants) of improved function for a single session of physiotherapy, primarily advice and instructions for a home exercise programme, compared with 'no intervention' after cast removal. There was low quality evidence from four heterogeneous trials (30, 33, 66 and 75 participants) of a lack of clinically important differences in outcome in patients receiving routine physiotherapy or occupational therapy in addition to instructions for home exercises versus instructions for home exercises from a therapist

Handoll, H. H., & Elliott, J. (2015). Rehabilitation for distal radial fractures in adults. Cochrane Database of Systematic Reviews.

Evidence for Therapy Following DRF

Journal of Hand Therapy 36 (2023) 860–876

Contents lists available at ScienceDirect

Journal of Hand Therapy

journal homepage: www.elsevier.com/locate/jht

Supervised exercise therapy program vs non-supervised exercise therapy program after distal radius fracture: A systematic review and meta-analysis

Felipe Soares, PT [a,b], Darlisson Paranhos, PT [a,b], Fernanda Campos, PT [a,b], Andrea Gasparini, PT, PhD [c], Luciane Fernandes, PT, PhD [a,b,c,*]

Soares F, Paranhos D, Campos F, Gasparini A, Fernandes L. Supervised exercise therapy program vs non-supervised exercise therapy program after distal radius fracture: A systematic review and meta-analysis. J Hand Ther. 2023 Oct-Dec;36(4):860-876. doi: 10.1016/j.jht.2023.06.009. Epub 2023 Aug 19. PMID: 37604769.

Evidence for Therapy Following DRF

Soares F, Paranhos D, Campos F, Gasparini A, Fernandes L. Supervised exercise therapy program vs non-supervised exercise therapy program after distal radius fracture: A systematic review and meta-analysis. J Hand Ther. 2023 Oct-Dec;36(4):860-876. doi: 10.1016/j.jht.2023.06.009. Epub 2023 Aug 19. PMID: 37604769.

Valdes K, Naughton N, Michlovitz S. Therapist-supervised clinic-based therapy versus instruction in a home program following distal radius fracture: a systematic review. J Hand Ther. 2014 Jul-Sep;27(3):165-73; quiz 174. doi: 10.1016/j.jht.2013.12.010. Epub 2014 Jun 3. PMID: 24908093.

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Evidence for Therapy Following DRF

- Systematic review of 1624 articles and identified 21 studies in the literature quantitatively evaluating the benefits of therapy following DRF
- Quality of studies is low
- No difference in pain re*lief*, improvement of ROM, function, and grip strength, both short or medium term
- Motivated and self-directed patients, with minimal complications and who have an understanding of hand function, can benefit from one or two supervised therapy sessions and following with home exercises

Soares F, Paranhos D, Campos F, Gasparini A, Fernandes L. Supervised exercise therapy program vs non-supervised exercise therapy program after distal radius fracture: A systematic review and meta-analysis. J Hand Ther. 2023 Oct-Dec;36(4):860-876. doi: 10.1016/j.jht.2023.06.009. Epub 2023 Aug 19. PMID: 37604769.

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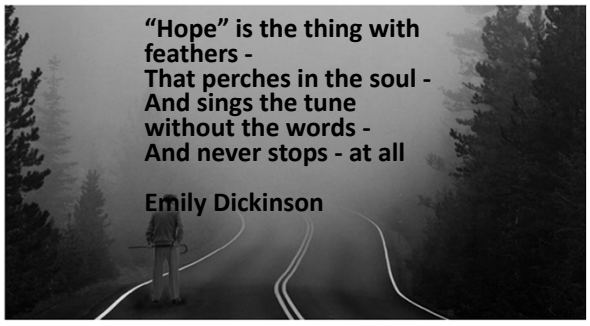
"Hope" is the thing with feathers -
That perches in the soul -
And sings the tune
without the words -
And never stops - at all
Emily Dickinson

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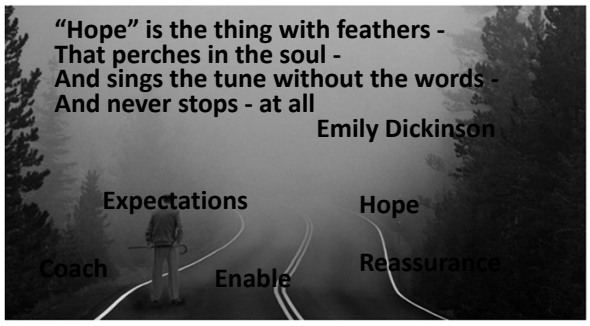
"Hope" is the thing with feathers -
That perches in the soul -
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And never stops - at all
Emily Dickinson
Expectations
Hope
Coach
Enable
Reassurance

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Coach
Shoulder Stretching
PUTTY EXERCISES
WRIST AROM EXERCISES

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Encourage / Enable

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Expectations

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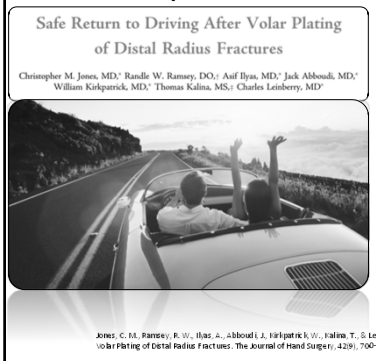
Expectation Milestones



Patients began driving on their own at an average of 13 days from surgery and 70% successfully passed the Highway Safety Examination at an average of 18.4 days from surgery on the distal radius

Jones, C. M., Ramsey, R. W., Ilyas, A., Abboudi, J. A., Kirkpatrick, W., Kalina, T., & Leinberry, C. (2017). Safe Return to Driving After Volar Plating of Distal Radius Fractures. The Journal of Hand Surgery, 42(9), 700–704.e2

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Motion Plateau Expectations

Time to plateau of wrist motion following a distal radius fracture

6-8 weeks 3-6 months 7-12 months >1 year

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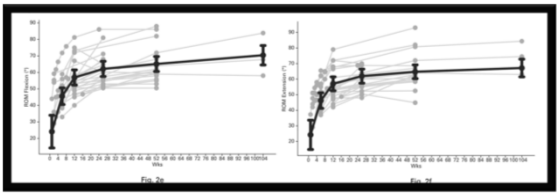
Set Expectation Timelines

A total of 46 study reports, inclusive of 3258 subjects studying longitudinal recovery over time



Wrist flexion and extension increased quickly during the first 3 months and statistically plateaued by 6 months

Stinton, S. B., Graham, P. L., Moloney, N. A., Maclachlan, L. R., Edgar, D. W., & Pappas, E. (2017). Longitudinal recovery following distal radial fractures managed with volar plate fixation. The Bone & Joint Journal, 99-B(12), 1665–1676

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Set Expectation Timelines

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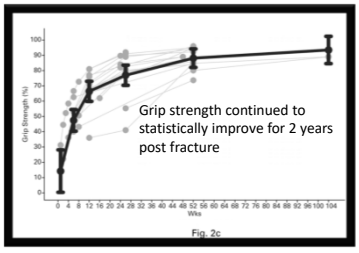

Grip strength continued to statistically improve for 2 years post fracture

Stinton, S. B., Graham, P. L., Moloney, N. A., Maclachlan, L. R., Edgar, D. W., & Pappas, E. (2017). Longitudinal recovery following distal radial fractures managed with volar plate fixation. The Bone & Joint Journal, 99-B(12), 1665–1676

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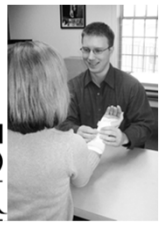
Is it Time to Change DRF Management?

THE MILWAUKEE HAND CENTER



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Is it Time to Change DRF Management?

Liam More O'Ferral BS

1. Perform background research on prior studies in the field
2. Statistically analyze current outcomes after closed vs. plate fixation treatment
3. Evaluate the intensivity of therapy in the practice

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ROM and Therapy Frequency in Distal Radius Fractures Treated by Plate Fixation vs. Casting Alone

Liam More O'Ferrall, Greg Watchmaker 2023
The Milwaukee Hand Center

ROM 1 Date	ROM Flex	ROM Exten	ROM 2 Date (Di	ROM Flex 2	ROM Flex Dif	ROM Exten 2	ROM Exten Dif	ROM Grip 2	Therapy Visits
6/28/21	15	15	10/5/2021	56	41	54	39	23	15
3/31/2022	15	30	8/4/2022	75	60	70	40	22	6
6/17/2013	30	45	6/26/2013	40	10	50	5	35	3
9/2/2021	17	17	11/12/2021	51	34	63	46	32	19
8/18/2016	28	36	10/18/2016	55	27	52	16	38	7
3/10/2022	30	30	5/19/2022	50	20	50	20		4
1/24/2022	34	50	1/31/2022	40	6	55	5		2
2/28/2022	14	24	4/27/2022	60	46	59	35	30	13
3/17/2016	35	45	4/7/2016	45	10	58	13	7	2
1/18/2017	45	65	2/28/2017	75	30	80	15		6
5/31/2017	15	50	6/28/2017	43	28	70	20	25	6
5/24/2021	14	45	8/19/2021	55	41	65	20	54	10
2/27/2018	20	32	3/9/2018	32	12	45	13		3
3/26/2018	10	25	8/20/2018	53	43	60	35	25	17
8/29/2018	10	30	10/23/2018	48	38	60	30		8
2/26/2019	17	20	5/6/2019	65	48	55	35	35	13
8/3/2021	33	48	9/2/2021	45	12	55	7	30	4
6/28/2019	5	10	9/16/2019	40	35	55	45		16
8/17/2022	19	19	11/10/2022	71	52	72	53	40	9

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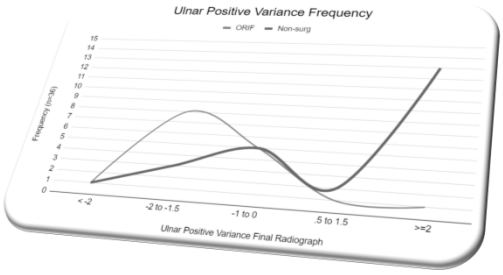
End Ulnar Positive Variance
(More O' Ferrall 2023, n=36)



Significant difference of means = 1.8mm (p=.045)

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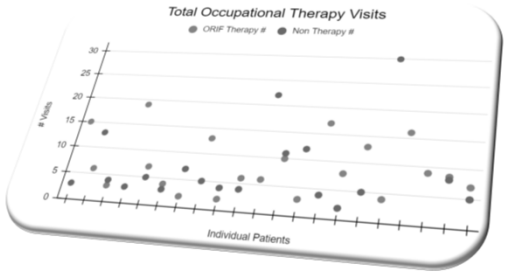
Therapy Visits per Fx Patient
(More O' Ferrall 2023, n=36)



ORIF Avg. Visits = 8.6 Non-surgical Avg Visits=8.1

No significant difference of means (p=.81)

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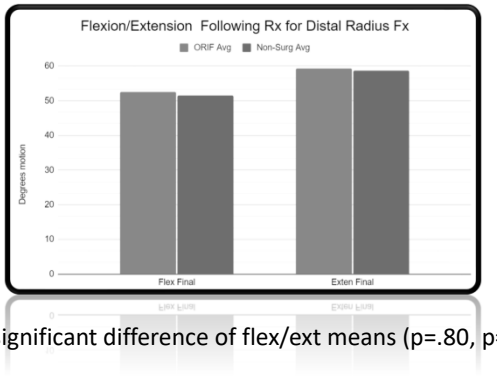
Range of Flexion and Extension
More O' Ferrall 2023, n=36)



No significant difference of flex/ext means (p=.80, p=.86)

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Is it Time to Change DRF Management?

Yes

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Is it Time to Change DRF Management?

Contents lists available at ScienceDirect

Journal of Hand Therapy

journal homepage: www.jhandtherapy.org

JHT Read for Credit Article #571.
Scientific/Clinical Article

A retrospective analysis of the number of therapy visits after distal radius fractures using a new provider-scored clinical severity scale

Eric Kirby OTR/L, CHT*, Sean Sparrow OTD, MS, OTR/L

Study average of 10 visits O.T. post-fracture
Finger stiffness independently predicts visit frequency

Kirby E, Sparrow S. A retrospective analysis of the number of therapy visits after distal radius fractures using a new provider-scored clinical severity scale. J Hand Ther. 2018 Oct-Dec;31(4):480-485. doi: 10.1016/j.jht.2017.06.008. Epub 2017 Jul 12. PMID: 28711410.

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Is it Time to Change DRF Management?

First visit (within 10 days of injury)

- Assess finger and shoulder motion (branch in decision-making)

Second visit (wrist mobilization):

- Engage, enable, sets expectations and provide reassurance
- Assess finger motion (branch in decision-making)
- Provide well structured handouts that detail self-directed progression

Third visit (mobilization check & strengthening):

- Measure objective progress, assess patient satisfaction
- Provide reassurance and re-discuss timeline of expectations

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In Summary

1. As a provider, know the underlying evidence
2. Empower the patient in decision-making (function, appearance, immobilization timeframe, risks)
3. Embrace conservative management

1. Wait (early mobilization complications outweigh benefits)
2. Set expectations regarding time frame to maximal improvement
3. Enable educable patients by providing home instruction and re-checks in contrast to scheduled visits in amenable patients

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