# Distal Radius Fractures in the Elderly

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### <u>Overview</u>

- Epidemiology
- Risk Factors for Elderly Distal Radius Fractures
- Evaluation
- Treatment
- Costs
- Post-fracture Management
- Conclusions



### **Epidemiology of Elderly Distal Radius Fractures**

- Most common upper extremity fracture (16%)
- Second most common overall fracture in elderly patients (18%), after hip fractures
- Incidence is increasing, especially in patients older than 65
- 15% of white women will fracture their distal radius after age 50





### **Epidemiology of Elderly Distal Radius Fractures**

- A prospective study of 15,293 adults demonstrated 6-fold higher likelihood of fracture among women compared with men ages 60 94 years (Singer et al. JBJS Br 1998)
- With advent of volar locking plates, ORIF for elderly patients has rapidly increased
  - Rates of internal fixation of DR fractures in elderly increased 39% from 1999 to 2007



### What is "Elderly"?

- No universally accepted age, literature varies
- UN uses age 60 as cutoff for "geriatric"
- WHO and many other organizations use age 65
- Osteoporosis and functional level may be more important than age alone





# **Risk Factors for DR Fracture**

- White race
- Female sex
- Osteoporosis
- Hypovitaminosis D
- Seasonal variations: Elderly are higher risk for slips and falls on ice
- Higher cognitive/motor function in elderly: more likely to brace a fall





### **Osteoporosis and the Distal Radius**

#### Utility of Distal Forearm DXA as a Screening Tool for Primary Osteoporotic Fragility Fractures of the Distal Radius

Satoshi Miyamura, MD, PhD, Kohji Kuriyama, MD, PhD, Kosuke Ebina, MD, PhD, Kunihiro Oka, MD, PhD, Masafumi Kashii, MD, PhD, Atsuo Shigi, MD, Hiroyuki Tanaka, MD, PhD, Makoto Hirao, MD, PhD, Hideki Yoshikawa, MD, PhD, and Tsuyoshi Murase, MD, PhD



- Retrospective, case-control study of postmenopausal women who had sustained DR fracture (n = 110) and postmenopausal women with no history of fracture (n = 95)
- Fracture group had lower BMD on DEXA and more pts with T-scores <2.5 SD in forearm
  - Spine and hip measurements did **not** differ significantly between the 2 groups
- Conclusion: Some postmenopausal women exhibit bone loss preferentially at DR



### **Initial Evaluation**

- History: mechanism, functional status, assistive devices, anticoagulation, etc.
- Assess neurovascular status: Acute CTS occurs in 5.4% 8.6% of all DR fractures
- Assess soft tissue envelope: Open fxs, risk of skin tears during reduction
- Assess forearm/elbow for concomitant injuries, secondary exam

#### Radiology:

- Standard views of wrist and forearm/elbow
- Generally do not need advanced imaging (CT, MRI) on initial evaluation

#### Initial treatment:

- Completely nondisplaced fractures should be splinted or braced in situ
- Acute displaced fractures should be closed reduced and splinted



# **Splinting**

A Comparison of Immediate Postreduction Splinting Constructs for Controlling Initial Displacement of Fractures of the Distal Radius: A Prospective Randomized Study of Long-Arm Versus Short-Arm Splinting

Matthew R. Bong, MD, Kenneth A. Egol, MD, Matthew Leibman, MD, Kenneth J. Koval, MD

From the Department of Orthopaedic Surgery, New York University/Hospital for Joint Diseases, New York, NY.

The Journal of Hand Surgery / Vol. 31A No. 5 May-June 2006

# • Long and short-arm splints had comparable performance in maintaining reduction

• Short-arm splints better tolerated

Is a short arm cast appropriate for stable distal radius fractures in patients older than 55 years? A randomized prospective multicentre study

M. J. Park<sup>1</sup>, J. P. Kim<sup>2</sup>, H. I. Lee<sup>3</sup>, T. K. Lim<sup>4</sup>, H. S. Jung<sup>5</sup> and J. S. Lee<sup>5</sup>

> The Journal of Hand Surgery (European Volume) 2017, Vol. 42E(5) 487–492

- No change in radiographs except improved volar tilt in LOC
- LOC had significantly higher incidence of difficulty with ADLs and shoulder pain
- Equivalent DASH and VAS



### **Treatment**









### **Does Osteoporosis Delay Healing?**

Does osteoporosis affect the healing of subcapital humerus and distal radius *Je* fractures?

Journal of Orthopaedics 22 (2020) 237-241

E.A. Gorter<sup>a,\*</sup>, B.M. Gerretsen<sup>a</sup>, P. Krijnen<sup>a</sup>, N.M. Appelman-Dijkstra<sup>b</sup>, I.B. Schipper<sup>a</sup>

- Retrospective cohort 311 patients age 50+ with DR fractures
- All pts had DEXA within 1 year of fx
- 286/311 (92%) treated nonoperatively
  - Osteoporosis in 28% of DR fractures
  - No effect on DR fracture healing





### Age is a Risk Factor for Displacement

### Prediction of Instability in Distal Radial Fractures

The Journal of Bone & Joint Surgery · jbjs.org Volume 88-A · Number 9 · September 2006

BY P.J. MACKENNEY, FRCS, M.M. MCQUEEN, MD, FRCSED(ORTH), AND R. ELTON, PHD

- Prospective collection of 4000 distal radius fractures
- Age most important factor associated with early displacement in displaced and minimally displaced fxs at presentation (p<0.001)
- Age significantly associated with late instability (p<0.001)
  - Age >80 4x more likely to have late instability than age <30
- Age significantly associated with malunion for closed treatment





78F s/p fall. 6 months: Painless ROM, full pronation and supination. Symptoms of continued acute onset CTS

25

AP and lateral immediate post fracture

AP and lateral 6 months follow up





Radiologic and Patient-Reported Functional Outcomes in an Elderly Cohort With Conservatively Treated Distal Radius Fractures

Alexander Anzarut, MD, Jeffrey A. Johnson, PhD, Brian H. Rowe, MD, Robert G. W. Lambert, MB, Sandra Blitz, MSc, Sumit R. Majumdar, MD, Edmonton, Alberta, Canada

The Journal of Hand Surgery / Vol. 29A No. 6 November 2004

- 74 pts age >50 years old with conservatively managed DR fractures
- 47 patients (64%) were considered to have an acceptable radiographic reduction
- Reduction quality **not** associated with:
  - Better physical or mental health status
  - Disability
  - Patient Satisfaction
- 59% of patients were satisfied or very satisfied with their functional status at 6 months



Research Article

#### Distal Radial Fractures in the Superelderly: Does Malunion Affect Functional Outcome?

ISRN Orthopedics Volume 2014, Article ID 189803, 7 pages

N. D. Clement, A. D. Duckworth, C. M. Court-Brown, and M. M. McQueen

- 51 superelderly patients (age >80) living independently with displaced fractures identified from prospective database of 4024 patients with distal radial fractures
- 35/51 pts (68.6%) underwent manipulation, 16/35 (45.7%) lost reduction and had ORIF
- 17 pts (33.3%) had malunion
- At 15 months: no difference in ADLs (P = 0.28), wrist pain (P = 0.14), grip strength (P = 0.31), or ROM (P = 0.41) in pts with or without malunion
- Increasing dorsal angulation correlated with diminished ROM (P = 0.038), but did not correlate with ADLs (P = 0.10)



### **Distal Radius Fractures in Older Patients**

Is Anatomic Reduction Necessary?

Andrew J. Synn BA, Eric C. Makhni BS, Melvin C. Makhni BS, Tamara D. Rozental MD, Charles S. Day MD, MBA Clin Orthop Relat Res (2009) 467:1612–1620

- Retrospective study of 53 patients older than 55 years with distal radius fractures
- Radiographic displacement had no effect on subjective or objective functional outcomes
- Surgically treated fractures less likely to display residual dorsal angulation and radial shortening, but surgical intervention did not independently predict functional outcome
- Comminution, patient gender, and months of followup had no effect on outcome







# Case: 75F with DR fx after fall s/p ORIF

1 year: ROM: 50º of flexion, 65º of extension, full pronation/supination. Painless motion







1 year follow up



## Comparison: Case Control 2010

### Distal Radial Fractures in the Elderly: Operative Compared with Nonoperative Treatment

J Bone Joint Surg Am. 2010;92:1851-7

By K.A. Egol, MD, M. Walsh, PhD, S. Romo-Cardoso, MD, Seth Dorsky, BS, and N. Paksima, DO

- 90 patients > 65 years treated with or without surgery for a displaced DR fracture
  - All fractures initially treated with closed reduction and splinting
  - Patients who failed an acceptable closed reduction were offered surgical intervention
- 24 weeks: operative group had better wrist extension (p = 0.04), DASH equal
- 1 year:
  - No differences in wrist extension, DASH, pain, complications
  - Grip strength, radiographic outcomes better in operative group
- Conclusion: Minor limitations in ROM and grip strength in non-operative group



### Comparison: RCT 2011

A Prospective Randomized Trial Comparing Nonoperative Treatment with Volar Locking Plate Fixation for Displaced and Unstable Distal Radial Fractures in Patients Sixty-five Years of Age and Older

J Bone Joint Surg Am. 2011;93:2146-53

Rohit Arora, MD, Martin Lutz, MD, Christian Deml, MD, Dietmar Krappinger, MD, PhD, Luzian Haug, MD, and Markus Gabl, MD

- 73 patients with displaced unstable DR fractures > age 65
  - Randomly allocated to volar plating vs plaster immobilization (casting)
  - 12 month follow-up
- Operative group had improved functional outcomes at 3 months, equivalent at 6 & 12 months
- Grip strength and radiographic outcomes superior in operative group at all intervals
- Complications significantly higher in operative group



### Comparison: RCT 2017

Intra-articular distal radius fractures in elderly patients: a randomized prospective study of casting versus volar plating

Daniel Martinez-Mendez<sup>1</sup>, Alejandro Lizaur-Utrilla<sup>1,2</sup> and Joaquin de-Juan-Herrero<sup>2</sup>

Journal of Hand Surgery (European Volume) 2018, Vol. 43(2) 142–147

- 97 patients with displaced complex intraarticular fractures > age 60
  - Randomly allocated to volar plating vs plaster immobilization
  - 2 year follow-up
- Operative group: Improved DASH, pain, QOL significantly improved
- Articular surface, radial inclination, and ulnar variance affected outcomes
  - Articular step-off had no effect on outcomes
- 25% of conservatively treated pts had secondary loss of reduction

# Comparison: All Ages RCT 2019

### Volar Plate Fixation Versus Plaster Immobilization J Bone Joint Surg Am. 2019;101:787-96 in Acceptably Reduced Extra-Articular Distal Radial Fractures

A Multicenter Randomized Controlled Trial

Marjolein A.M. Mulders, MD, PhD, Monique M.J. Walenkamp, MD, PhD, Susan van Dieren, PhD, J. Carel Goslings, MD, PhD, and Niels W.L. Schep, MD, PhD; on behalf of the VIPER Trial Collaborators\*

- Multicenter RCT, age 18-75 years, with an acceptably reduced extra-articular DR fracture
  - Median age: 59 years
  - Randomly assigned to ORIF w volar plate fixation vs plaster immobilization
- Operative treatment: Better DASH scores at all follow-up intervals
- 12 nonoperatively managed patients (28%) had fracture re-displacement within 6 weeks

 6 nonoperatively managed patients patients (14%) had symptomatic malunion treated with corrective osteotomy

# Comparison: Elderly Only RCT 2019

### Nonoperative Treatment Compared with Volar Locking Plate Fixation for Dorsally Displaced Distal Radial Fractures in the Elderly

A Randomized Controlled Trial

Jenny Saving, MD, Sara Severin Wahlgren, MD, Kristin Olsson, MD, Anders Enocson, MD, Sari Ponzer, MD, Olof Sköldenberg, MD, Maria Wilcke, MD, PhD, and Cecilia Mellstrand Navarro, MD, PhD

- 140 patients randomly allocated to plaster splint or volar locking plate fixation
- Age >70, some heterogeneity in fracture inclusion criteria between sites
- 3 & 12 months: Operative group had improved DASH, self-reported outcomes, grip strength
  - Radiographic measurements also favored volar locking plate at 3 and 12 months
- Complication rates similar:
  - Major Complications: 11% in nonoperative group vs 14% in operative group
  - Minor Complications: 11% in nonoperative group vs 20% in operative group



J Bone Joint Surg Am. 2019;101:961-9

JAMA Network Open. 2020;3(4):e203497.

# Meta-analysis 2020

#### Original Investigation | Orthopedics Operative vs Nonoperative Treatment of Distal Radius Fractures in Adults A Systematic Review and Meta-analysis

Yassine Ochen, MD; Jesse Peek, BSc; Detlef van der Velde, MD, PhD; Frank J. P. Beeres, MD, PhD; Mark van Heijl, MD, PhD; Rolf H. H. Groenwold, MD, PhD; R. Marijn Houwert, MD, PhD; Marilyn Heng, MD, MPH

- Metanalysis of 8 RCTs and 15 Observational Studies (n=2,254)
  - Mean age 67, subgroup analysis of patients 60+ years
- No improvement in medium-term (<1 year) DASH scores in age 60+ subgroup
- Grip strength improved in operative group for all ages
- Significant difference in complication rate in favor of nonoperative treatment compared with other studies that included patients 18 years or older





# Secondary Analysis of WRIST RCT

Original Investigation | Surgery Assessment of Anatomic Restoration of Distal Radius Fractures Among Older Adults A Secondary Analysis of a Randomized Clinical Trial

JAMA Network Open. 2020;3(1):e1919433.



Kevin C. Chung, MD, MS; Hoyune E. Cho, MD; Yeonil Kim, PhD; H. Myra Kim, ScD; Melissa J. Shauver, MPH; for the WRIST Group

- Grip strength, ROM, and Michigan Hand Outcomes Questionnaire (MHQ) measured at 12 months following treatment
- Every degree increase in radial inclination away from normal (22°) associated with 1.1 kg weaker grip strength than the uninjured hand
- No radiographic parameters associated with MHQ total or function scores
- Conclusion: Precise restoration of wrist anatomy not associated with better patient outcomes for older adults



### **Nonoperative vs ORIF Summary**

#### What is relatively consistent among comparison studies?

- Improves with surgery: Grip strength, radiographic outcomes, early function
- Worse with surgery: Complication rate
- Equal: Healing ability

#### What is still up for debate?

- Overall functional outcomes
- Pain







### Case: 83F after fall s/p external fixation

1 year: ROM: 60º of flexion, 60º of extension, near full pronation/supination. Minimal discomfort



Immediate post-op



1 year follow up



# **Operative Technique Details**

Is there a benefit of proximal locking screws in osteoporotic distal radius fractures? – A biomechanical study

Benjamin Bockmann<sup>a</sup>, Can Budak<sup>a</sup>, Jens Figiel<sup>b</sup>, Philipp Lechler<sup>a</sup>, Christopher Bliemel<sup>a</sup>, Florian Debus<sup>a</sup>, Tim Schwarting<sup>a</sup>, Ludwig Oberkircher<sup>a</sup>, Michael Frink<sup>a,\*</sup>

- 12 osteoporotic radii from 6 cadavers, all given AO 23-A2.1 and volarly plated
- Either locking or nonlocking screws used in shaft
- Biomechanical testing performed in staircase fashion: starting with 50 cycles at 200 N, with load continuously increased
  - Failure = sudden loss of force measured (20%) or major deformation of radii (10 mm)
- Reasons for loss of fixation: longitudinal shaft fractures, horizontal peri-implant fractures and distal cutting out
- No difference between groups in development of loss of fixation

Conclusion: No benefit of locking screws in osteoporotic bone



'Injury, Int. J. Care Injured 47 (2016) 1631–1635

### **External Fixation vs Volar Locking Plate**

External Fixation Versus Volar Locking Plate for Unstable Dorsally Displaced Distal Radius Fractures—A 3-Year Follow-Up of a Randomized Controlled Study Jenny Saving, MD,\*† Anders Enocson, MD, PhD,\*‡ Sari Ponzer, MD, PhD,\*† Cecilia Mellstrand Navarro, MD, PhD\*§

J Hand Surg Am. • Vol. 44, January 2019

- 140 pts with dorsally displaced DR fracture randomized to volar plate vs external fixator
- Mean age: ex-fix (EF) group: 63 (50-74), volar locking plate (VLP) group: 63 (51-74)
- No differences regarding DASH, PRWE, EQ-5D, ROM or grip strength
- Reoperation rate 21% (13 of 62) in VLP group compared with 14% (8 of 56) in EF group
- OA rate 42% (25 of 59) in VLP group compared with 28% (15 of 53) in EF group
- Conclusion: Results comparable



#### JAMA Network Open. 2019;2(1):e187053.

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### **Complications**

- 304 adults, 60+ years old with isolated unstable DR fxs
- 117 opted for casting
- 187 randomized:
  - Volar locking plate (65)
  - Percutaneous pinning (58)
  - External fixation +/supplemental pinning (64)

**Original Investigation** | Orthopedics

#### Assessment of Distal Radius Fracture Complications Among Adults 60 Years or Older A Secondary Analysis of the WRIST Randomized Clinical Trial

Kevin C. Chung, MD, MS; Sunitha Malay, MPH; Melissa J. Shauver, MPH; H. Myra Kim, ScD; for the WRIST Group

Table 4. Covariate-Adjusted RR of Any, Moderate, or Severe Complication in 12 Months Among 287 Participants

	Complications, Adjusted RR (95% CI) <sup>a</sup>			
/ariables	Any	Moderate <sup>b</sup>	Severe <sup>c</sup>	
Treatment group, ITT				
Volar locking plate system	1 [Reference]	1 [Reference]	1 [Reference]	
External fixation	1.41 (0.92-2.16)	2.52 (1.25-5.09) <sup>d</sup>	2.96 (0.92-9.46)	
Pinning	1.23 (0.81-1.97)	1.56 (0.73-3.32)	2.46 (0.70-8.67)	
Casting/observational	1.88 (1.22-2.88) <sup>e</sup>	1.07 (0.49-2.34)	2.47 (0.73-8.44)	
Assessment time, wk	0.98 (0.97-0.99) <sup>e</sup>	0.98 (0.96-0.99) <sup>d</sup>	0.96 (0.94-0.98) <sup>e</sup>	
Age, y				
60-70	1 [Reference]	1 [Reference]	1 [Reference]	
71-80 vs 60-70	0.91 (0.64-1.29)	1.18 (0.65-2.15)	0.48 (0.18-1.23)	
81-90 vs 60-70	1.25 (0.82-1.90)	1.68 (0.84-3.35)	0.69 (0.24-2.02)	
≥90 vs 60-70	1.60 (0.79-3.21)	1.69 (0.49-5.83)	1.95 (0.39-9.73)	
Male	1.20 (0.80-1.81)	1.29 (0.65-2.52)	1.30 (0.45-3.74)	
Black vs white/other <sup>f</sup>	1.47 (0.83-2.59)	0.77 (0.28-2.22)	2.84 (0.84-9.59)	
Asian vs white/other <sup>f</sup>	0.50 (0.28-0.89) <sup>d</sup>	1.08 (0.43-2.70)	0.45 (0.09-2.11)	
Current smoker vs nonsmoker	1.24 (0.75-2.06)	1.07 (0.42-2.67)	2.02 (0.68-5.88)	
Active vs sedentary	1.43 (0.87-2.34)	1.27 (0.52-3.11)	0.64 (0.22-1.88)	



	No. (%) <sup>b</sup>				
Type of Complication	VLPS (n = 65)	External Fixation (n = 62)	Pinning (n = 56)	Casting (n = 104)	
Nerve					
Median nerve compression/carpal tunnel syndrome	12 (18.5)	9 (14.5)	14 (25.0)	25 (24.0)	
Radial nerve compression/neuropathy	3 (4.6)	8 (12.9)	4 (7.1)	2 (1.9)	
Ulnar nerve compression neuropathy	5 (7.7)	4 (6.5)	3 (5.4)	4 (3.9)	
Reflex sympathetic dystrophy	2 (3.1)	4 (6.5)	2 (3.6)	8 (7.7)	
Bone/joint					
Arthritis	10 (15.4)	11 (17.7)	8 (14.3)	26 (25.0)	
Carpal instability/subluxation	4 (6.2)	4 (6.5)	0	5 (4.8)	
Malunion <sup>c</sup>	1 (1.5)	8 (12.9)	2 (3.6)	35 (33.7)	
Delayed union	1 (1.5)	3 (4.8)	1 (1.8)	3 (2.9)	
Distal radioulnar joint problems	4 (6.2)	5 (8.1)	3 (5.4)	16 (15.4)	
Tendon					
Dupuytren contracture	5 (7.7)	1 (1.6)	2 (3.6)	2 (1.9)	
Tendon adhesion/scarring	5 (7.7)	3 (4.8)	4 (7.1)	6 (5.8)	
Tendon rupture/tear	0	1 (1.6)	2 (3.6)	2 (1.9)	
Tendinitis/tenosynovitis	3 (4.6)	5 (8.1)	4 (7.1)	3 (2.9)	
Trigger finger	2 (3.1)	4 (6.5)	2 (3.6)	5 (4.8)	
Other					
Pin site/incision infection	1 (1.5)	16 (25.8)	13 (23.2)	NA	
Digit stiffness	6 (9.2)	3 (4.8)	5 (8.9)	1 (1.0)	
Ulnar sided wrist pain	2 (3.1)	2 (3.2)	2 (3.6)	5 (4.8)	
Shoulder pain/stiffness	0	2 (3.2)	1 (1.8)	2 (1.9)	
Prolonged/unusual swelling	3 (4.6)	2 (3.2)	2 (3.6)	1 (1.0)	
Wrist stiffness	2 (3.1)	1 (1.6)	1 (1.8)	4 (3.9)	
Pain (not shoulder or ulnar-sided wrist)	3 (4.6)	2 (3.2)	2 (3.6)	3 (2.9)	
Fixator problem (eg, cast too tight, lost pin)	3 (4.6)	5 (8.1)	7 (12.5)	1 (1.0)	
Any complication	31 (47.7)	45 (72.6)	35 (62.5)	76 (73.1)	

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### **Complications**

#### Early Complications Following Osteosynthesis of Distal Radius Fractures: A Comparison of Geriatric and Nongeriatric Cohorts

Richard M. Hinds, MD<sup>1</sup>, John T. Capo, MD<sup>1</sup>, Sanjeev Kakar, MD<sup>2</sup>, James Roberson, MD<sup>3</sup>, and Michael B. Gottschalk, MD<sup>3</sup>

Geriatric Orthopaedic Surgery & Rehabilitation 2017, Vol. 8(1) 30-33

- Retrospective study of 9,867 DRFs treated with osteosynthesis by ABOS part II candidates
- Geriatric patients comprised 28% of cohort
- Geriatric cohort demonstrated higher rates of: anesthetic complications, iatrogenic bone fracture, implant failure, loss of reduction, unspecified medical complications, and death
- Geriatric cohort showed lower rates of nerve palsy
- Similar rates of secondary surgery



### <u>Costs</u>

- Estimated Medicare system expenditure for DR fractures: \$170 million annually in 2007
  - 32% of costs were related to internal fixation
- Average Medicare beneficiary incurs additional \$7700 in charges in 6 months after DR fx
- Operative treatment of fractures that could have been appropriately treated nonoperatively results in an 11x cost increase (Nandyala et al, JBJS 2018)
- Inappropriate nonoperative management of operatively indicated fractures resulted in 7x cost increase





### <u>Costs</u>

### Comparison of Direct Perioperative Costs in Treatment of Unstable Distal Radial Fractures

Open Reduction and Internal Fixation Versus Closed Reduction and Percutaneous Pinning J Bone Joint Surg Am. 2018;100:786-92

Sreeharsha V. Nandyala, MD, Aviram M. Giladi, MD, MS, Amber M. Parker, BS, and Tamara D. Rozental, MD

- Financial data for 40 patients randomized to undergo CRPP or ORIF for treatment of closed, displaced, unstable distal radial fracture reviewed
- ORIF group incurred greater 90-day and 1-year direct costs
  - Differential greatest in immediate perioperative period and gradually decreased over time
- Operating room fees, operating room implants, anesthesia and total perioperative costs significantly greater in ORIF cohort
- ORIF cohort demonstrated significantly better functional outcomes at 6, 9, and 12 weeks and similar outcomes at 1 year



### Can We Prevent Fractures in the Elderly?

# Distal Radius Fracture Risk Reduction With aJHS • Vol 37A, August 2012Comprehensive Osteoporosis Management Program

Neil G. Harness, MD, Tadashi Funahashi, MD, Richard Dell, MD, Annette L. Adams, PhD, MPH, Raoul Burchette, PhD, Xuan Chen, PhD, Denise Greene, BS

- Retrospectively identified 524,612 patients aged + from large health maintenance organization
  - 1.7% of cohort (n=8,658) sustained a new distal radius fracture
- Patients with osteoporosis 8.9 times more likely to have DR fracture
- Patients who were screened for osteoporosis were 83% less likely to sustain DR fracture
- Patients who received pharmacological intervention 48% less likely to sustain DR fracture



### **Osteoporosis Management after Fracture**

Osteoporosis care after distal radius fracture reduces subsequent hip or spine fractures: a 4-year longitudinal study

Osteoporosis International 3 April 2020

Y.H. Shin<sup>1</sup> • W.K. Hong<sup>2,3</sup> • J. Kim<sup>2</sup> • H.S. Gong<sup>3</sup>

- 1057 patients with a DRF (85% women; mean age, 70 years)
- 205 patients treated prior to osteoporosis care program, 852 patients post care program
- Subsequent fractures occurred in 27 patients (2.6%), mean interval 29 months after DRF
- Incidence of subsequent fx significantly lower in pts in post-injury osteoporosis care program (1.9% vs. 5.4%, p = 0.004)
- Relative risk reduction was 65% for all subsequent fractures and 86% for hip fractures



### **Osteoporosis Management after Fracture**

Improving Evaluation and Treatment for Osteoporosis Following Distal **Radial Fractures** By Tamara D. Rozental, MD, Eric C. Makhni, BS, Charles S. Day, MD, and Mary L. Bouxsein, PhD

J Bone Joint Surg Am. 2008;90:953-61

298 consecutive DR fragility fracture patients retrospectively assessed for osteoporosis eval

- 50 patients with DR fragility fracture prospectively randomized to:
  - 1. Orthopaedic surgeon ordering bone mineral density examination and forwarding results to PCP
  - 2. Orthopaedic surgeon sending a letter to PCP outlining guidelines for osteoporosis screening
- Patients contacted 6 mo after fx to determine rates of osteoporosis evaluation and treatment ٠
- Retrospective results: 21.3% of patients had a bone mineral density examination, 78.7% never screened
  - Treatment rate for patients with BMD examination 2.5x higher than no BMD exam
- Patients randomized to Group 1 (Ortho surgeon ordering BMD testing) had 2-3x greater rates of BMD testing, discussion of osteoporosis with PCP, and initiation of osteoporosis therapy than Group 2 (letter)



### AOA Critical Issues

### Bone Health Optimization: Beyond Own the Bone

#### AOA Critical Issues

Paul A. Anderson, MD, Kyle J. Jeray, MD, Joseph M. Lane, MD, and Neil C. Binkley, MD Investigation performed at the University of Wisconsin, Madison, Wisconsin

- AOA has identified bone health optimization as a critical issue
- Own the Bone: Initiative to assess current orthopaedic practices for prevention of secondary fractures in elderly, pilot quality-improvement tools, and identify barriers to implementation

Recommendations:

- Patients >50 years of age should be assessed for osteoporosis risk, if high-risk BMD measured
- All patients counseled to consume adequate vitamin D and calcium and discontinue smoking/alcohol
- Patients who meet criteria for pharmaceutical therapy for osteoporosis should begin treatment
- Orthopaedic surgeons need to assume a greater role in the care of bone health for our patients



### Hand Therapy after Fracture

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 Kevin C. Chung, M.D., M.S. Sunitha Malay, M.P.H. Melissa J. Shauver, M.P.H. For the Wrist and Radius Injury Surgical Trial Group

Plastic and Reconstructive Surgery • August 2019

- Examined outcomes of patients in WRIST trial
- Examined outcomes between participants who underwent therapy (n=215) and who did not (n=53)
- Participants who received surgical treatment were more likely to have therapy
- No differences in patient-reported outcomes
- Participants who did not have therapy recovered more grip strength
- Shorter therapy time associated with greater function, ability to work, and satisfaction
- Conclusion: Hand therapy after distal radius fracture may not be necessary for older patients



### Management after Fracture

- Evaluate elderly patients with DR fractures for osteoporosis
- Patients should be referred to PCP or specialists for further evaluation
- Ordering BMD testing prior to PCP referral is beneficial
- Also important to evaluate nutritional status
- Occupational Therapy may not be necessary





### **Conclusions**

- Elderly patients are high risk population for DR fxs
  - Associated with significant healthcare costs
- Treatment (operative vs nonoperative) is controversial
  - Pts with osteoporosis more likely to displace fractures/develop malunion but may not be clinically relevant
- Treatment plan should not solely be based on age important to consider activity level and comorbidities



## <u>Thank you</u>



