

Introduction

- Metacarpal shaft fractures are common outcomes of hand trauma and can be managed both operatively and nonoperatively
- Metacarpal fractures generally occur most often in younger populations
- For select indications, surgical fixation has functional benefits
- The aim of this study was to evaluate the demographic factors and social determinants of health affecting whether a patient undergoes fracture fixation after a diagnosis of a metacarpal shaft fracture

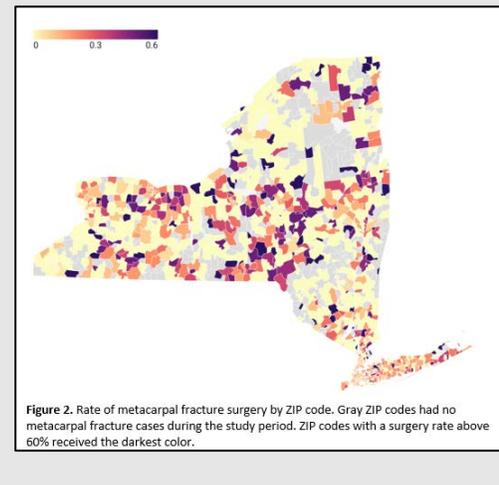
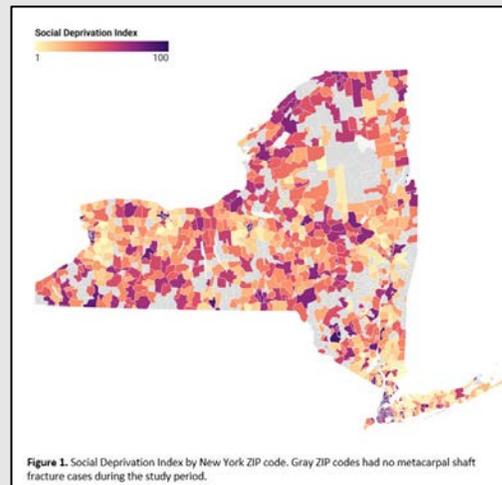
Methods

- Adult patients (≥18 years old) diagnosed with a metacarpal shaft fracture in the New York Statewide Planning and Research Cooperative System (SPARCS) database from 2011-2018
- Multivariable logistic regression analysis to determine the likelihood of having surgical fixation (CPT: 26608, 26615)
- Variables included social deprivation index (SDI), Charlson comorbidity index, age, sex, race, ethnicity, and insurance status to assess associations with non-surgical or surgical treatment
- SDI is an index from 1-100 based on: percent living in poverty, percent with less than 12 years of education, percent single parent household, percent living in rented housing unit, percent living in overcrowded housing unit, percent of households without a car, and percent non-employed adults under 65 years of age
- P-value ≤0.05 considered significant across all analyses

	No Surgery n = 9,713	Surgery n = 1,611	P-value
Age, median (mean, SD)	31 (37, 18.3)	28 (32.1, 13.3)	<.0001
Sex, n (%)			
Female	2,755 (28.4)	367 (22.8)	<.0001
Male	6,958 (71.6)	1,244 (77.2)	-
Ethnicity, n (%)			
Non-Hispanic	8,098 (83.4)	1,329 (82.5)	0.3824
Hispanic	1,615 (16.6)	282 (17.5)	-
Race, n (%)			
White	5,133 (52.9)	933 (57.9)	0.0002
Asian	232 (2.4)	55 (3.4)	0.0153
African American	2,310 (23.8)	299 (18.6)	<.0001
Other	2,038 (21)	324 (20.1)	0.4258
Primary Insurance, n (%)			
Private	4,967 (51.1)	998 (62)	<.0001
Medicare	1,078 (11.1)	74 (4.6)	<.0001
Medicaid	1,574 (16.2)	267 (16.6)	0.7105
Worker's Compensation	450 (4.6)	84 (5.2)	0.3081
Self-pay	1,557 (16)	177 (11)	<.0001
Other	87 (0.9)	11 (0.7)	0.3929
Charlson Score, n (%)			
0	9,115 (93.8)	1,544 (95.8)	0.0016
≥1	598 (6.2)	67 (4.2)	-
SDI, median (mean, SD)	72 (63.7, 30.9)	66 (59.6, 31.1)	<.0001

	Rate of Surgery (14.2%)	Odds Ratio (95% CI)	P-value
Age		0.985 (0.981 - 0.99)	<.0001
Sex			
Males	15.2	-	-
Females*	11.8	0.873 (0.764 - 0.996)	0.044
Race			
White Race	15.4	-	-
Asian Race*	19.2	1.256 (0.923 - 1.709)	0.1477
African American Race*	11.5	0.747 (0.639 - 0.874)	0.0003
Other Race*	13.7	0.861 (0.728 - 1.018)	0.0796
Ethnicity			
Non-Hispanic Ethnicity	14.1	-	-
Hispanic Ethnicity*	14.9	1.124 (0.951 - 1.33)	0.1707
Primary Insurance			
Private	16.7	-	-
Medicare*	6.4	0.582 (0.439 - 0.771)	0.0002
Medicaid*	14.5	0.867 (0.748 - 1.006)	0.0608
Worker's Compensation*	15.7	0.956 (0.748 - 1.221)	0.7165
Self-Pay*	10.2	0.565 (0.476 - 0.672)	<.0001
Other*	11.2	0.587 (0.312 - 1.107)	0.0998
Charlson Score			
CCI = 0	14.5	-	-
CCI ≥ 1*	10.1	0.874 (0.67 - 1.14)	0.3195
SDI	-	0.997 (0.995 - 0.999)	0.0048

*compared to males
*compared to white race
*compared to non-Hispanic ethnicity
*compared to private insurance
*compared to CCI = 0



Results

Cohort Analysis

- 11,324 patients with a metacarpal shaft fracture; 1,611 (14.2%) patients received surgical fixation
- No surgery group: Older, higher social deprivation, increased incidence of female sex, African-American, Medicare, and Self-pay

Disparities Analysis

- Increased age (OR=0.985, p<.0001) had decreased odds of surgical fixation
- Females (OR=0.873, p=0.044) relative to males had decreased odds of surgical fixation
- African American race (OR=0.747, p=0.0003) had decreased odds of surgical fixation relative to white race
- Medicare (OR=0.582, p<.0002) and Self-pay (OR=0.565, p<.0001) had decreased odds of surgical fixation relative to private insurance
- Those from areas with higher social deprivation had decreased odds of surgical fixation (OR=0.997, p=0.0048)

Conclusions

- First study to utilize the SPARCS database to evaluate the demographic and socioeconomic differences between patients who did or did not undergo surgical fixation after a diagnosis of metacarpal shaft fracture
- Patients with non-private insurance, non-White race, and higher social deprivation scores had a decreased odds of receiving surgical fixation
- SDI provides an example of one such strategy that could be used to highlight communities who are more at risk of health inequalities
- Considering the relationship between differential care and health disparities, it is critical to define the disparities involved and to increase physician awareness to promote appropriate management of metacarpal shaft fractures