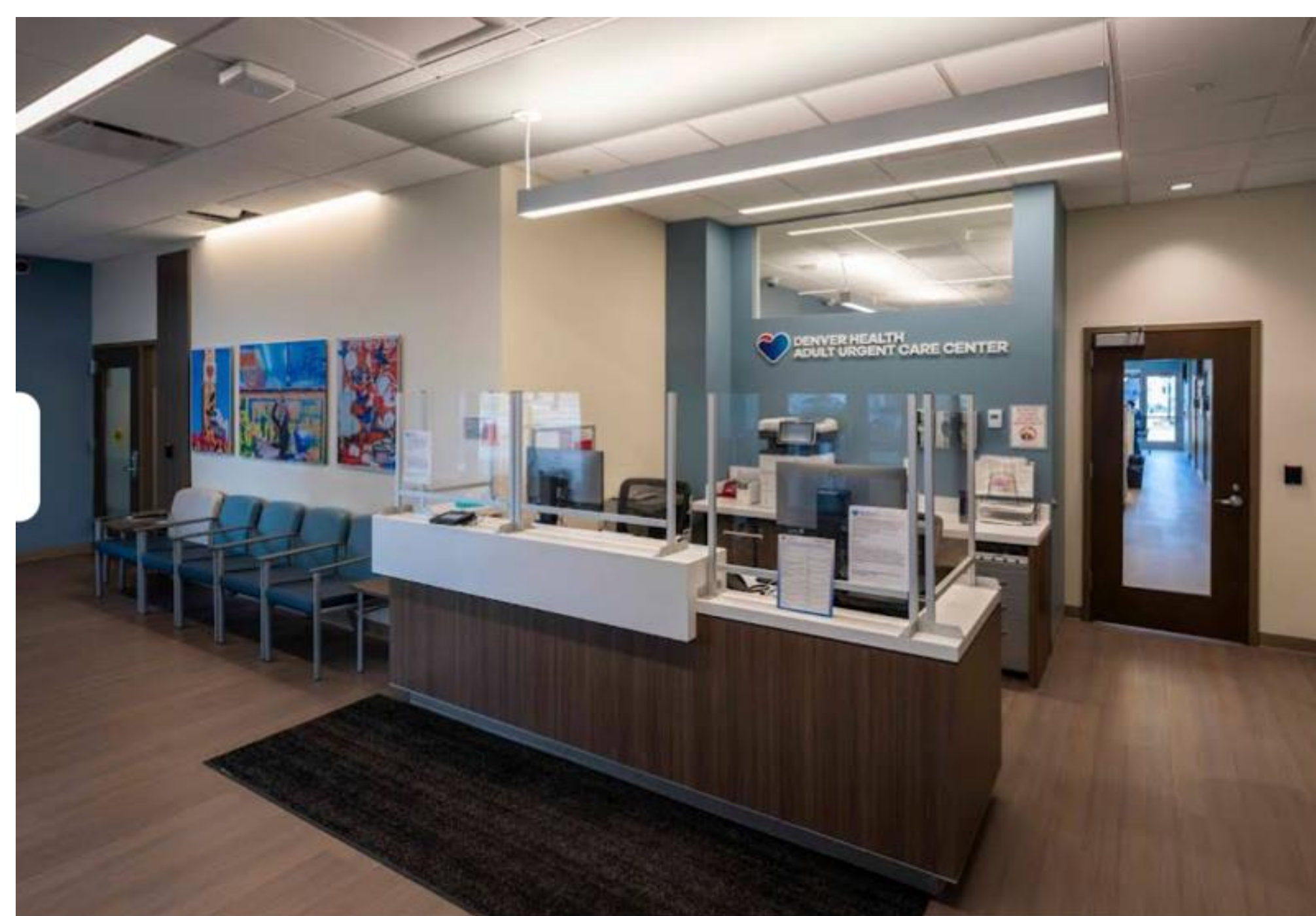


Introduction

- Rib injuries and fractures are common in acute care
- ED studies show significant morbidity (pneumothorax, hemothorax, pneumonia)
- **Known ED predictors for morbidity:**
 - ❖ Older age
 - ❖ Male sex
 - ❖ Multiple fractures
 - ❖ Abnormal vital signs
- Limited data on rib injury patterns in urgent care
- Blunt chest trauma is commonly evaluated in urgent care
- Diagnostic pathways are less defined in UC

Purpose

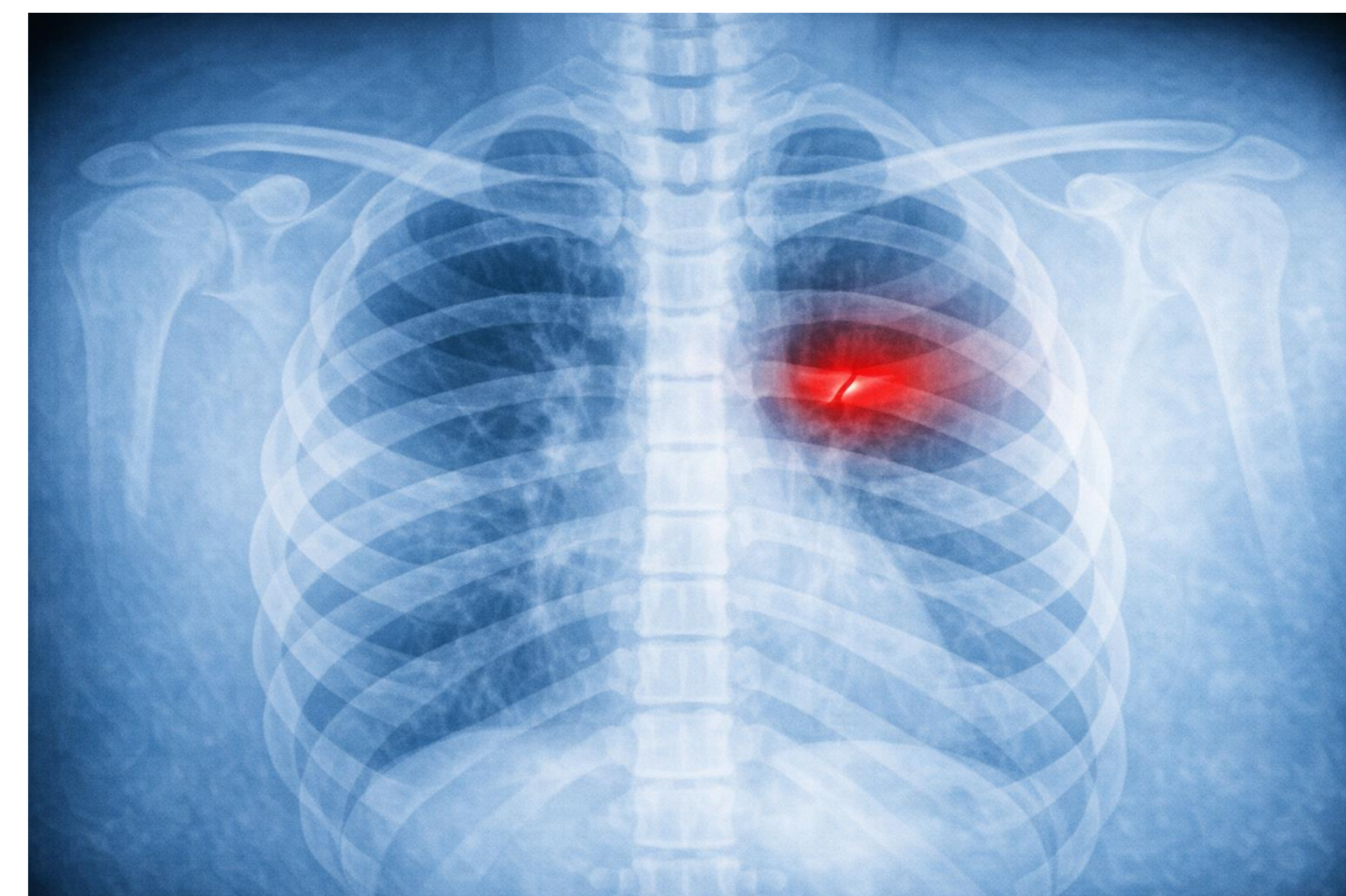
- Determine rates of rib injury, rib fracture, and rib-related complications in urgent care.
- Identify demographic and clinical predictors of:
 - ❖ Rib Fracture
 - ❖ Rib-related complications
 - ❖ ED transfer
 - ❖ Hospital admission
 - ❖ 7-day ED/UC return
- Study conducted at Federico F. Peña Southwest and Adult Urgent Care Clinics; Federally Qualified Health Centers within Denver Health (a safety net system)



Methods

Patient Inclusion and Outcomes

- Non-human subject research (Denver Health QulRC; COMIRB, University of Colorado)
- Retrospective cross-sectional EHR study
- Adult patient visits at two UC clinics (5/1/2016–3/31/2025)
- Rib injury encounters identified by rib-related ICD-10 codes
- Encounters ≥90 days apart treated as separate events
- **Primary Outcomes:**
 - ❖ Rib injury rate
 - ❖ Rib fracture rate
- **Secondary Outcomes:**
 - ❖ Rib-related complications (*pneumothorax, hemothorax, pneumonia*)
 - ❖ Disposition from UC (*discharge home, ED transfer, hospital admission*)
 - ❖ 7-day ED/UC return visit



Statistical Analysis

- Categorical variables summarized as counts and percentages
- Multivariable logistic regression used to estimate adjusted OR (95% CI)
- Variables included:
 - ❖ **Demographics:** age, sex, race/ethnicity, insurance, housing, language
 - ❖ **Comorbidities:** diabetes, asthma/COPD, cardiac disease
 - ❖ **Abnormal vitals:** HR >100, RR >20, O₂ <90%, SBP <100

Results

Included Visits

- 497,393 total UC encounters
- 2,188 rib injury encounters (0.44%)

	Rib-related Injury Overall	Rib Fracture Present	P-Value	Complication from Injury	P-Value
Total Patient Encounter	2188	747 (34.1%)		33 (1.5%)	
Gender (Sex)					
Male	1350	510 (68.3%)	P < 0.0001	28 (84.4%)	P = 0.0060
Female	Suppress	Suppress		Suppress	
Unknown	244	102 (13.8%)		Suppress	
Age Group					
18-44 years	1343	302 (40.4%)	P < 0.0001	15 (45.5%)	P = 0.7287
45-64 years	801	342 (45.8%)		Suppress	
65+ years	244	102 (13.8%)		Suppress	
Race/Ethnicity					
Hispanic	986	320 (42.8%)	P = 0.1576	11 (33.3%)	P = 0.2345
White	908	332 (44.4%)		Suppress	
Black/African American	163	48 (6.4%)		Suppress	
Other	138	47 (6.3%)		Suppress	
Payer					
Commercial Insurance	411	129 (17.3%)	P = 0.0373	Suppress	P = 0.2796
Medicaid/Medicare	1307	474 (63.5%)		Suppress	
Uninsured	470	144 (19.3%)		Suppress	
Housing Status					
Housed	1894	632 (84.6%)	P = 0.0412	29 (87.9%)	P = 0.1292
Homeless/Unhoused	82	38 (13.1%)		Suppress	
Language					
English	1732	580 (77.9%)	P = 0.2286	26 (76.8%)	P = 0.2100
Spanish	375	141 (18.9%)		Suppress	
Other	81	24 (3.2%)		Suppress	
Comorbidity Conditions					
Any (DM, Asthma/COPD, Cardiac)	708	254 (34.0%)	P = 0.2365	14 (42.4%)	P = 0.2130
No Comorbidities	1480	493 (66.0%)		19 (57.6%)	
Vital Signs					
Any abnormal vital signs	219	97 (13.0%)	P = 0.0008	10 (30.3%)	P < 0.0001
No abnormal vital signs	1969	650 (87.0%)		23 (69.7%)	
Complications					
Yes	33	27 (3.6%)	P < 0.0001		
No	2155	720 (96.4%)			

Table 1: Demographic Characteristics of Urgent Care Rib Injury Encounters

Results

- **Rib fracture rate:** 34.1% (747/2188)
- **Complication rate:** 1.5% (33/2188)
- **Predictors of rib fracture:** older age, male sex, Spanish language, White race, abnormal vital signs, and presence of complications
- **Predictors of complications:** abnormal vital signs and non-English language; female sex associated with lower odds
- Complications strongly associated with ED transfer and hospital admission

Multivariate Analysis

Factor		Rib Fracture		Complications	
		OR	95% CI	OR	95% CI
Sex	Male				
	Female	0.641	0.527, 0.779	0.278	0.105, 0.738
Age in Years	Ages 18-44				
	Ages 45-64	2.213	1.792, 2.733	1.163	0.518, 2.612
	Ages ≥ 65	2.395	1.732, 3.312	1.358	0.396, 4.656
Language	English				
	Other	0.738	0.429, 1.269	5.841	1.518, 22.469
	Spanish	1.516	1.106, 2.078	1.522	0.394, 5.882
Race/Ethnicity	Hispanic				
	Black/African American	0.926	0.624, 1.373	1.179	0.288, 4.826
	Other	1.387	0.909, 2.117	1.788	0.732, 4.367
	White	1.309	1.040, 1.649		
Insurance	Medicaid/Medicare				
	Commercial/Uninsured	0.927	0.717, 1.199	0.806	0.286, 2.268
Housing Status	Housed				
	Unhoused	1.094	0.802, 1.492	0.311	0.041, 2.354
Comorbidity	None				
	Any Comorbidity	0.787	0.631, 0.981	1.496	0.678, 3.303
Abnormal Vital Signs	None				
	Abnormal Vital Signs	1.573	1.169, 2.118	3.980	1.816, 8.726
Complications	No Complications				
	Complications	7.727	3.114, 19.175		

Table 2: Adjusted Odds Ratios for Rib Fracture and Complications

Discussion

Findings

- Rib fractures in ~1/3 of urgent care rib injury encounters; complications uncommon (1.5%)
- **Rib fracture associated with:** older age, male sex, abnormal vital signs, Spanish language preference, White race, presence of complications
- **Complications associated with:** abnormal vital signs, non-English/Spanish language, and male sex; strongly linked to ED transfer and hospital admission

Clinical Implications

- Older age and abnormal vital signs → consider closer evaluation and imaging
- Language and ethnicity differences → possible disparities in injury severity, access, or presentation
- Early recognition of complications → timely escalation of care

Next Steps

- Mechanisms underlying language and race/ethnicity differences in fracture/complication risk
- Comorbidities and rib fracture outcomes
- Imaging use patterns across demographic groups
- Expansion to additional UC sites to assess generalizability

Limitations

- Two UC clinics within one health system → limited generalizability
- Rare complications (1.5%) → limited power for subgroup analysis
- Retrospective design → cannot infer causality

Conclusions

- Rib fractures common in urgent care rib injury encounters; complications uncommon but linked to escalation of care
- Risk stratification using age, vital signs, language, and race/ethnicity may support clinical decision-making in urgent care