

Investigation of Healthcare Disparities in the Treatment of Bacterial Infections: An Assessment of a Single Urgent Care Clinic

Derrick Murcia, B.S. ¹, Alex Nguyen, B.S. ¹, Lindsey E. Fish, M.D.^{1,2}



1. University of Colorado School of Medicine, 2. Denver Health and Hospital

Background

- Treatment for bacterial infections vary among institutions, leading to differences in patient outcomes¹
- Research is needed to identify if race/ethnic healthcare disparities persist in urgent care clinics (UCCs) as they do in other clinical settings²
- Here, we investigated whether disparities exist at a single urgent care clinic focusing on 7 commonly treated bacterial infections

Clinic Overview

- The Federico F. Peña Southwest Urgent Care Clinic opened April 2016 as a community based urgent care clinic affiliated with Denver Health and Hospital
- Over 24,000 visits a year to an underserved population of 65% Medicaid patients and 30% Spanish speaking patients
- Provides moderate/advanced urgent care diagnostic and management services



Methods

- This is a retrospective study that used ICD-10 codes to find medical charts of patients who were treated for bacterial infections from 1/1/17 - 12/31/20 (n = 6,698)
- Conditions investigated: acute cystitis, acute pyelonephritis, bacterial sinusitis, COPD exacerbation, GAS infections, bite infections, and cellulitis
- Primary Outcome: guideline-concordant treatment
- Secondary Outcome: 14 day return rates following the urgent care visit

Methods

Table 1. List of ICD-10 codes with Corresponding Clinical Diagnosis

ICD-10 Code	Clinical Diagnosis
J01.XX	Acute sinusitis
J02.o	Acute pharyngitis
J44.XX	Chronic obstructive pulmonary disease
L03.XX	Cellulitis
N10.XX	Acute pyelonephritis
N30.XX	Acute cystitis
W50.3XXA	Human bite
W54.oXXA	Dog bite
W55.o1XA	Cat bite
Y04.1XXA	Assault by human bite

Table 2. Demographic Data

	Total	Pyelo	Sinus	Cellu	Bites	Strep	COPD	Cyst
Age (mean +/- SD)	35.63 (16.30)	39.59 (16.44)	39.59 (15.36)	47.77 (16.06)	42.31 (15.74)	32.01 (17.45)	40.61 (9.85)	41.50 (17.53)
Sex								
Female	4852 (72.42%)	33 (89.19%)	672 (72.84%)	764 (33.39%)	111 (58.52%)	1361 (47.04%)	125 (24.98%)	1780 (94.89%)
Male	1842 (27.58%)	4 (10.81%)	256 (27.16%)	666 (46.61%)	84 (41.08%)	640 (21.26%)	87 (17.02%)	96 (5.11%)
Other/Unknown	4 (0.06%)	0 (0.00%)	1 (0.11%)	1 (0.07%)	0 (0.00%)	2 (0.10%)	0 (0.00%)	0 (0.00%)
Ethnicity								
Hispanic	4871 (69.75%)	27 (72.97%)	594 (63.94%)	581 (48.55%)	114 (58.48%)	1447 (47.92%)	87 (17.02%)	1622 (75.58%)
Not Hispanic	2094 (30.25%)	10 (27.03%)	320 (34.41%)	447 (31.34%)	80 (41.03%)	555 (18.58%)	135 (24.98%)	458 (24.41%)
Other/Unknown	22 (0.33%)	0 (0.00%)	6 (0.65%)	3 (0.21%)	1 (0.51%)	30 (0.97%)	0 (0.00%)	2 (0.11%)
Race								
American Indian/Alaska Native	121 (1.81%)	0 (0.00%)	35 (3.73%)	26 (1.81%)	1 (0.51%)	39 (1.24%)	5 (2.98%)	36 (1.95%)
Asian	182 (2.73%)	1 (2.70%)	22 (2.37%)	22 (2.24%)	7 (3.59%)	58 (1.83%)	10 (4.72%)	53 (2.82%)
Black or AA	256 (3.82%)	2 (5.41%)	36 (3.88%)	40 (2.80%)	5 (2.56%)	92 (2.97%)	15 (7.08%)	66 (3.51%)
Other Pac Islander	1 (0.01%)	0 (0.00%)	1 (0.11%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Native Hawaiian	1 (0.01%)	0 (0.00%)	1 (0.11%)	0 (0.00%)	0 (0.00%)	1 (0.03%)	0 (0.00%)	1 (0.05%)
White	5564 (84.44%)	24 (65.27%)	769 (82.93%)	1245 (87.69%)	171 (87.69%)	1472 (47.10%)	172 (33.24%)	1573 (81.58%)
Other/Unknown	478 (7.14%)	0 (0.00%)	65 (7.00%)	88 (6.15%)	11 (5.61%)	150 (4.72%)	10 (4.72%)	154 (8.18%)
Insurance Status								
Medicaid	3342 (49.90%)	18 (48.65%)	483 (51.90%)	699 (48.81%)	84 (41.08%)	1057 (33.51%)	79 (15.46%)	922 (48.99%)
Medicare	898 (13.41%)	4 (10.81%)	113 (12.25%)	256 (17.89%)	29 (14.67%)	52 (1.71%)	112 (21.83%)	202 (10.74%)
Private	866 (12.93%)	6 (16.22%)	151 (16.25%)	147 (10.27%)	33 (16.52%)	325 (10.51%)	11 (5.11%)	103 (5.45%)
Uninsured/Other	1597 (23.77%)	9 (24.32%)	182 (19.59%)	329 (22.99%)	49 (23.13%)	538 (17.41%)	10 (4.72%)	475 (25.24%)
Had correct abx prescription	3894 (58.14%)	36 (97.30%)	554 (59.63%)	915 (63.81%)	150 (76.92%)	645 (20.66%)	118 (24.98%)	1476 (78.43%)
Had any abx within 14 days	1911 (28.55%)	9 (24.32%)	226 (24.42%)	484 (33.82%)	47 (23.10%)	448 (14.27%)	70 (13.62%)	617 (32.78%)

Results

Table 3. Multivariable Analysis Comparing Guideline-Concordant and Guideline-Discordant Antibiotic Treatment

Infection	Grouping	Category	P-value	OR	CI Lower Limit	CI Upper Limit	Alpha < 0.05
Bites	Combined	Ethnicity	0.9529	>999.999	<0.001	>999.999	
		Age	0.6997	1.004	0.982	1.027	
	Separated	Sex	0.2968	0.691	0.345	1.384	
		Insurance Status	0.4366	1.313	0.661	2.606	
		Race	0.7364	1.199	0.417	3.444	
		Ethnicity	0.0019	0.685	0.539	0.87	*
Cellulitis	Combined	Ethnicity	0.0174	0.741	0.579	0.949	*
		Age	0.0012	1.012	1.005	1.019	*
	Separated	Sex	0.2264	0.873	0.7	1.088	
		Insurance Status	0.0507	0.794	0.63	1	
		Race	0.8466	0.968	0.697	1.345	
		Ethnicity	0.4958	0.826	0.476	1.432	
COPD	Combined	Ethnicity	0.5878	0.855	0.485	1.507	
		Age	0.8004	0.996	0.965	1.028	
	Separated	Sex	0.3776	1.284	0.737	2.236	
		Insurance Status	0.43	0.769	0.4	1.478	
		Race	0.9637	0.983	0.475	2.036	
		Ethnicity	0.9795	1.003	0.777	1.296	
Acute cystitis	Combined	Ethnicity	0.4755	0.899	0.671	1.205	
		Age	0.0007	0.988	0.981	0.995	*
	Separated	Sex	<.0001	31.125	16.323	59.351	*
		Insurance Status	0.0143	0.726	0.562	0.938	*
		Race	0.8846	0.975	0.696	1.366	
		Ethnicity	0.9572	<0.001	<0.001	>999.999	
Acute pyelonephritis	Combined	Ethnicity	0.9561	<0.001	<0.001	>999.999	
		Age	0.4381	1.142	0.816	1.598	
	Separated	Sex	0.9478	<0.001	<0.001	>999.999	
		Insurance Status	0.9185	>999.999	<0.001	>999.999	
		Race	0.9976	0.471	<0.001	>999.999	
		Ethnicity	0.252	1.173	0.893	1.541	
Acute Sinusitis	Combined	Ethnicity	0.3854	1.132	0.856	1.497	
		Age	<.0001	0.977	0.968	0.986	*
	Separated	Sex	0.7661	1.046	0.776	1.41	
		Insurance Status	0.8401	0.973	0.742	1.275	
		Race	0.7088	0.931	0.64	1.354	
		Ethnicity	0.6764	1.046	0.847	1.291	
Acute pharyngitis	Combined	Ethnicity	0.7055	1.042	0.841	1.292	
		Age	0.7568	0.999	0.7568	0.7568	
	Separated	Sex	0.1237	1.174	0.957	1.441	
		Insurance Status	0.8917	1.014	0.835	1.23	
		Race	0.8944	1.017	0.788	1.314	
		Ethnicity	0.9572	<0.001	<0.001	>999.999	

Results are reported first with combined data and then subdivided based on other demographic variables by each infection type. Statistical significance is indicated in the column located on the right with a ***, OR = odds ratio, CI = confidence interval, 95%.

Table 4. Multivariable Analysis Comparing Guideline-Concordant and Guideline-Discordant Treatment Groups 14-Day Return Rates

Infection	Grouping	Category	P-value	OR	CI Lower Limit	CI Upper Limit	Alpha < 0.05
Bites	Combined	Guideline Treatment	0.4644	0.737	0.325	1.67	
		Guideline Treatment	0.3536	0.666	0.282	1.573	
	Separated	Age	0.0008	1.041	1.017	1.068	*
		Sex	0.0533	2.233	1.066	4.679	*
		Insurance Status	0.2264	0.939	0.31	1.319	
		Ethnicity	0.6924	<0.001	<0.001	>999.999	
Cellulitis	Combined	Guideline Treatment	0.0812	0.82	0.651	1.032	*
		Guideline Treatment	0.2767	0.877	0.682	1.111	
	Separated	Age	<.0001	1.027	1.019	1.034	*
		Sex	0.0664	1.299	1.004	1.579	*
		Insurance Status	0.3364	0.888	0.7	1.13	
		Ethnicity	0.6138	0.971	0.758	1.243	
COPD	Combined	Guideline Treatment	0.2649	1.407	0.791	2.501	
		Guideline Treatment	0.2188	1.451	0.802	2.625	
	Separated	Age	0.6852	1.007	0.973	1.043	
		Sex	0.8603	0.947	0.519	1.729	
		Insurance Status	0.1625	0.609	0.364	1.221	
		Ethnicity	0.086	1.712	0.927	3.161	
Acute cystitis	Combined	Guideline Treatment	0.003	1.412	1.124	1.773	*
		Guideline Treatment	0.1437	1.208	0.838	1.557	
	Separated	Age	<.0001	1.022	1.016	1.028	*
		Sex	0.7729	0.934	0.568	1.483	
		Insurance Status	0.5197	1.056	0.566	1.962	
		Ethnicity	0.2074	1.166	0.918	1.481	
Acute pyelonephritis	Combined	Guideline Treatment	0.8833	>999.999	<0.001	>999.999	
		Guideline Treatment	0.9827	>999.999	<0.001	>999.999	
	Separated	Age	0.9112	1.003	0.982	1.057	
		Sex	0.964	>999.999	<0.001	>999.999	
		Insurance Status	0.2721	2.959	0.427	20.507	
		Ethnicity	0.9553	>999.999	<0.001	>999.999	
Acute Sinusitis	Combined	Guideline Treatment	0.7281	0.948	0.701	1.282	
		Guideline Treatment	0.2543	0.833	0.609	1.14	
	Separated	Age	<.0001	1.028	1.017	1.038	*
		Sex	0.0094	1.616	1.125	2.321	*
		Insurance Status	0.006	0.645	0.472	0.882	*
		Ethnicity	0.2858	1.192	0.864	1.645	
Acute pharyngitis	Combined	Guideline Treatment	0.0096	1.382	1.078	1.72	*
		Guideline Treatment	0.0068	1.384	1.064	1.752	*
	Separated	Age	<.0001	1.018	1.01	1.027	*
		Sex	0.0001	1.803	1.258	2.643	*
		Insurance Status	0.2745	0.868	0.71	1.102	
		Ethnicity	0.814	1.03	0.807	1.319	

Results are reported first with combined data and then subdivided based on other demographic variables. Statistical significance is indicated in the column located on the right with a ***, OR = Odds ratio, CI = Confidence interval, 95%.

Key Results

Primary Outcome:

- Bacterial sinusitis
 - Older patients less likely to receive guideline-concordant treatment
- Cellulitis
 - Hispanic patients less likely to receive guideline-concordant treatment
 - Older patients more likely to receive guideline-concordant treatment
- Acute cystitis
 - Non-Medicaid patients less likely to receive guideline-concordant treatment

Secondary Outcome:

- 14-day return rates were significant for at least one demographic variable across all infections except for pyelonephritis

Conclusions

- Antibiograms provide objective pathways for treating bacterial infections and mitigate disparities²
- Minimal significant differences observed across all bacterial infections
- More research is needed to investigate disparities in UCCs
- Future work will include expanding this methodology to other UCCs in the area



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