



Implementing A Novel Electronic Medical Record (EMR) for Street Medicine in Denver

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Introduction

What is "street medicine"?

- Started in 1990s by Dr. Jim Withers and others
- "House calls" to the street and most vulnerable
- Now part of medical programs nationally and globally

Why should we care?

- Average lifespan of unhoused population up to **30 years** less than housed population¹
- Low access to brick-and-mortar health systems

Challenges in Street Medicine^{2,3}:

- Patient continuity and mobility
- Lack of standardized documentation
- Electronic vs. paper medical records



Who we are

CU Street Medicine is a student-run group that:

- Enhances education around healthcare for people experiencing homelessness
- Brings social and medical outreach services to people experiencing homelessness in the Denver Metro Area
- Clinic services include:
 - Routine screenings (i.e. blood pressure, blood glucose)
 - Prescription and referral services
 - Dedicated time with licensed provider
 - Harm reduction, wound care, cold weather supplies

Research Purpose

Our current limitations:

- Cumbersome and error-prone paper records
- Limited space on intake forms
- Poor referral and follow-up data

This project will:

- Streamline accurate data collection
- Allow for follow-up on patient data
- Identify needs of patients to improve outreach

Methodology: Project Stages

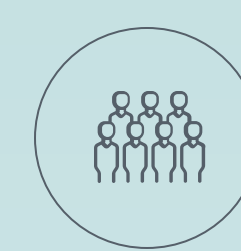


1. Development

Transition paper medical record to online format

Build EMR in HIPAA-compliant database

Finalize EMR with key stakeholders



2. Implementation

Implement and troubleshoot EMR at outreaches

Train clinic staff in utilizing EMR

Adapt EMR to fit clinic flow and patient needs



3. Data Analysis

Analyze key informant data from volunteers

Quantitative review of medical issues addressed

Assessment of supplies given by region

Initial Pilot Testing

Pilot testing highlighted points of improvement in our EMR system:


- Database in REDCap vs. Google Administrator Spreadsheet
- Data collection methods
- Access to HIPAA-compliant database by volunteers

Transitioning from paper to electronic medical records:

Blue section = Triage team

Pink section = Vitals team

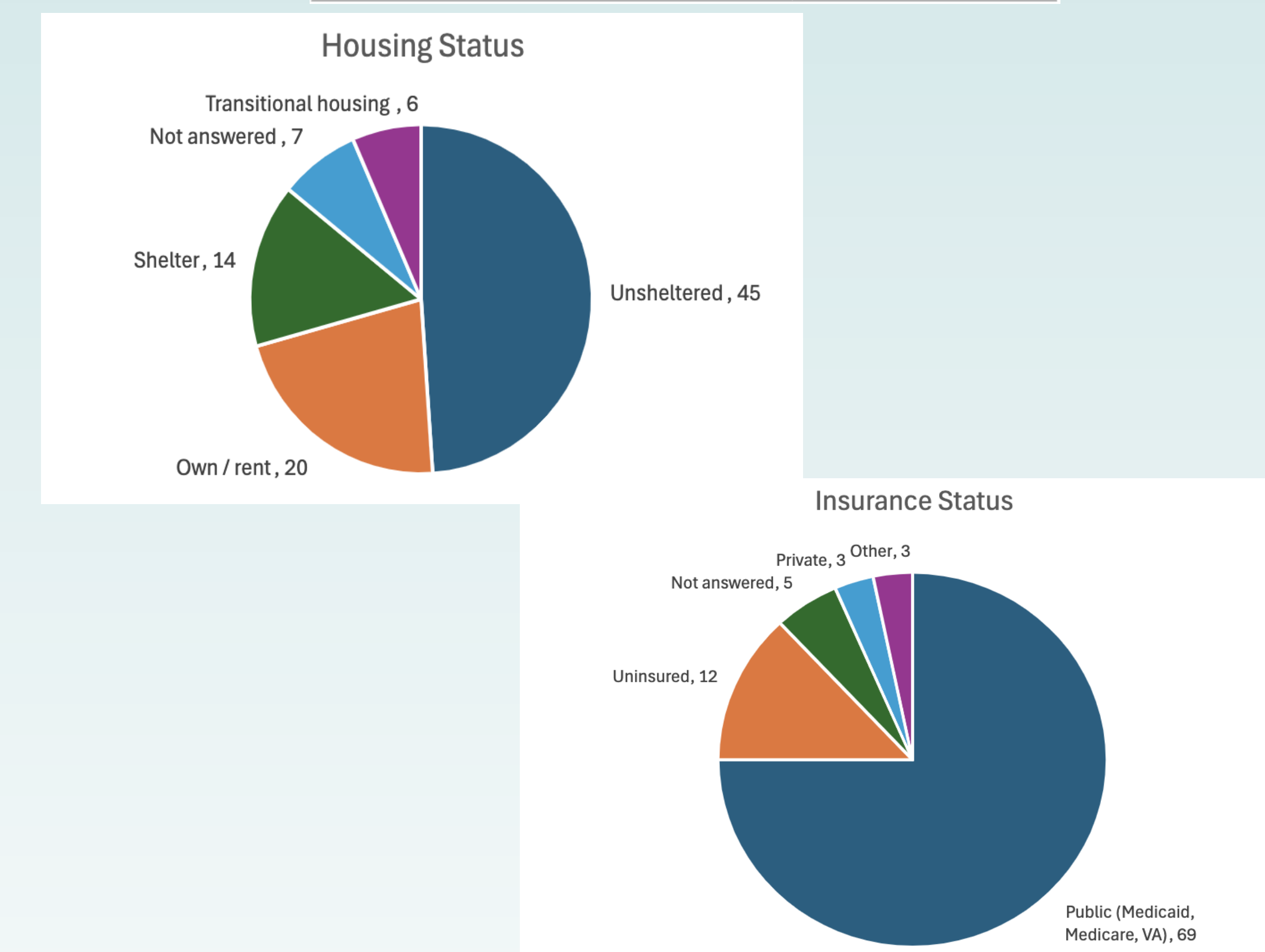
Orange section = Provider / scribe

Subjective											
Patient First Name	Patient Last Name	DOB	Gender	Race	Insurance status	Chief Complaint	Last appointment (ie. PCP, dental, ED)	Medical History (including substance use, allergies)	Medications	Living situation	Contact info willing to give
			Man	White	Public program (Medicaid, Medicare)	chronic SOB, COPD, L leg DVT, needs reading glasses	- ED visit few months ago for dog bite on R arm - admitted for 4d last winter for DVT (no PE)	NKDA, COPD (not on home O2), Bronchitis, Alcoholism, 1/2 pack per day	Not taking any - reports he should be taking medication for the DVT but is scared of the side effects		
			Woman	White	Public program (Medicaid, Medicare)	needs psych meds refil, SOB, COPD, vision concerns, growth on L inner eye "Don't judge me"	last PCP visit in 2022; ED last year Seen at Stout Street?	NKDA, Cirrhosis of alcoholism, COPD, CHF, COPD	Seroquel (50mg), trazadone (not currently taking, wants refills and to restart)		
			Man	Black / African American	Public program (Medicaid, Medicare)	Needs inhaler for asthma, psych meds refil, severe depression (no current SI), tooth cap fell off	1) no PCP; 2) urgent care visit ~month ago for fall on the back and arm 3) shooting pain down L leg	NKDA, Severe depression with h/o suicidal tendencies (last SI 1 month ago, has attempted, has vague plan but denies current SI), hx of L axillary abscess s/p drainage + abs 1mo ago, Asthma, 20 yr 1/2 pack/day smoker	no current meds, wants to restart meds for depression, look wellbutrin and trazodone (dose unknown)		
Objective						Assessment / Plan					
Temp (°F)	Blood pressure	Blood sugar (fasting or post-prandial?)	HR	O2 sat	physical exam	Plan & Follow up	Supplies/OTC Given	Prescription Given (name/dose/quantity)	LHCP Signature	Photos	
99.0F	114/80	132	93	84% RA	1) normal cardiac exam - no murmurs 2) no crackles, wheezes, or ronchi, slightly diminished lung sounds 3) Volume Status: no bl/ extremity edema	Given clinic referral to follow-up O2 levels, pt denied referral	Lotion, Bug spray		Kathryn Boyd, MD		
						1) signed up for medicaid today 2) 10AM 7/25 appt at Open + Affordable dental 3) will meet with Sherry on wednesday office hrs for case management help	Melatonin	1) Seroquel 50mg tablets QD, 30 tablets, 6 refills	Kathryn Boyd, MD		
98.0F	136/82	112	99	88% on RA	1) diminished bilateral bases 2) heart sounds normal	1) Dental visit scheduled for next week 2) abscess in left arm got warm compress no clean cloth given doxy 3) given med refil script Wellbutrin (taken before no SE, no hx of seizures) albuterol, trazadone (taken before no SE)	Bug spray, Melatonin	1) Wellbutrin 100mg PO BID, 60 tablets, 3 refills 2) Trazodone 150mg PO QHS, 30 tablets, 6 refills 3) Albuterol 90mcg, 2 puffs PRN, 6 refills 4) Doxycycline 100mg PO QD, 30 tablets, 2 refills	Kathryn Boyd, MD		

Name: Example Patient	DOB: XX/XX/XXXX	Date: XX/XX/XXXX	Location: Adams County Food Bank
Race: Caucasian	Sex: Male	Gender: he/him/his	LGBTQ+: Y / N
Height: 5'10"	Time: 10:00am 1/1	Contact #: XXX-XXX-XXXX	Y/N
Insurance: N/A	PCP: N/A	Careworker: N/A	Employed: Y / N
Last PCP: 1/1	Last Dental: 1/1	Last ER: 1/1	# ER < 3 yr: 1
Alleges: N/A			
BPH: pedal blones, checked 1 wk ago			
FMIH: no previous medical surgical hx			
FMIH: Father: T1DM, Mother: UNK, Patient Grandmother: dystonia CA			
BPH: Depress			
Medication: none			
Smoker: Y / N / F	ETOH: Y / N / F	MD: Y / N / F	Opoid: Y / N / F
Mark: Y / N / F	Rx: Y / N / F	PDMS: Y / N / F	Other: N/A
Assessment: bilateral pedal blones, quaternary, severe drainage, no v's infection, physical exam 7/25			
Gen: 1/25	HEENT: 1/25	CV: 1/25	Resp: 1/25
Neu: 1/25	GI: 1/25	GU: 1/25	Mus: 1/25
Temp: 98.0	HR: 112	BP: 114/80	RR: 18
SpO2: 94%	FIM: 112	Pain: 2/10	2 Vax: Flu < 1 yr, Tetanus < 1 yr, COVID-19 < 2 Hcp A, TB test
Prescription: Seroquel (medication), suspended foot, social security (SSN) < 1 yr, 1/25			
Plan: dental blones, needs to SSN, apply previous plan (PD), social security (SSN)			
Ask long-term chronic: visit wound with clean water and change NAD w/ PF w/ eye, other dx: follow up with PCP as told for recommendation, call 611 if significant swelling, redness, red streaks, yellow pus, fever, no OOP, NVD, pain gets worse			
Rx: N/A			
Follow-Up: N/A Clinic	Referral: N/A	Supplies: wound socks, water bottle, 1 wk supply of NAD PF	
Signed: Example Student (Credentials), Example Student (Credentials), Example Provider, (Credentials)			

Preliminary Results

Chief Concern	Number of Patients
Vitals / routine check up	35
Wound care	21
Over-the-counter medications / supplies	17
Acute concerns	12
Prescription refills	5
Other	2
Total Patients	92
Referrals made	20
Prescriptions written	19



Conclusions

Street medicine is a needed service in Denver. This EMR shows that primarily for unsheltered individuals, street medicine meets needs for primary care, wound care, and over-the-counter supplies. Our outreach should continue prioritizing these needs, and this EMR will help refine programming as we gather more patient data.

References

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Novel elements of the EMR:

- Spreadsheet capabilities for analysis of patient needs / resource utilization
- Format easily adaptable to organizational growth
- More space for details of medical history and encounter