Proving the Value of Community Paramedicine

Presented by

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Patient Story

- 30 year old female
- EMS/ED patient at least once per week
- Minimal insurance
- Noncompliance with diabetic care
- Noncompliance with heart failure care
- Significant drug abuse history
- Enabling family structure
- Poor communication efforts



Patient Story

- Community Paramedicine visited her four times in 30 days
- Improved diabetic self-care
- Heavily educated, and helped develop sustainable heart failure self-care habits
- Motivated family to help
- Coordinated care plan changes with Heart Failure clinicians
- Connected patient to local clinical and social resources

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Patient Was Not Admitted for Over One Year



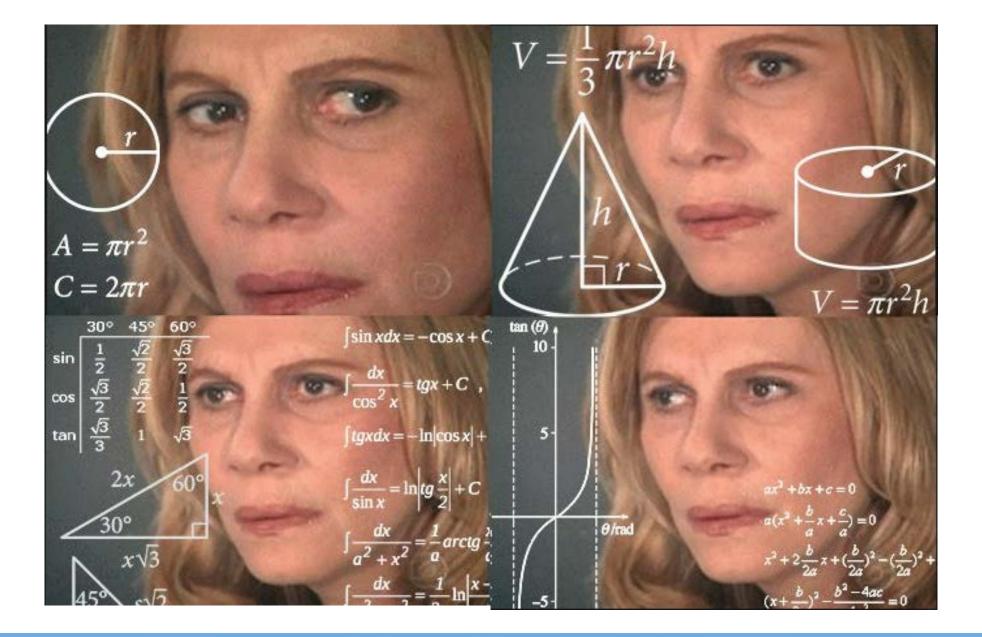
Hold On...

- How do we know Community Paramedicine improved her situation?
- Are other interventions at work?
- How many readmissions had she had prior?
- How much money did each on of her readmissions cost the hospital?
- Do all readmissions cost the same?
- Does billing revenue offset readmissions?
- Does this patient have non-healthcare related factors in play?
- How can it possibly be cost-effective to provide a free service?
- What other variables at in play?



- Were social determinants of health considered?
- How was she specifically coded?
- Should Home Health nursing have been involved?
- Was there a discharge issue?
- How long did the visits take?
- Did she qualify for Rehab?
- Was she enrolled in disease-specific processes?
- Does she have a PCP?
- Did she attend scheduled appointments?
- Who's on first?







Proving the Value of Community Paramedicine



Learning Objectives

- Recognize the clinical versatility of Community Paramedicine
- Apply basic analytical concepts in planning for Community Paramedicine
- Identify high-impact areas of opportunity for intervention
- Develop framework of process measures that allow for demonstration of effectiveness
- Identify conflating variables and understand the importance of normalization
- Describe the value of rapid process improvement
- Analyze the clinical impact of an existing CP program



Community Paramedicine's Strengths

- Emerging and developing
- Highly versatile
- Low-cost
- Expanding positive visibility with hospitals and payers
- Flexible staffing and process options
- Ability to interface with health systems





Community Paramedicine Pitfalls

- Vague implementation
- Non-committed structuring
- Limited community and healthcare system awareness
- Lack of reliably direct revenue stream
- Lack of comprehensive data tracking and analysis
- Lack of healthcare partnerships
- Inability to truly demonstrate value





Universal Questions Surrounding "Value"

- Is Community Paramedicine safe for patients?
- Are these programs providing quality services recognized by external entities
- Do these programs positively impact other healthcare providers?
- Do these program generate savings by reducing total cost of care?



Value to Whom?







Population

Group of all items of interest. Frequently very large, sometimes infinite.

• E.g., All 300 million US voters, all customers of a company

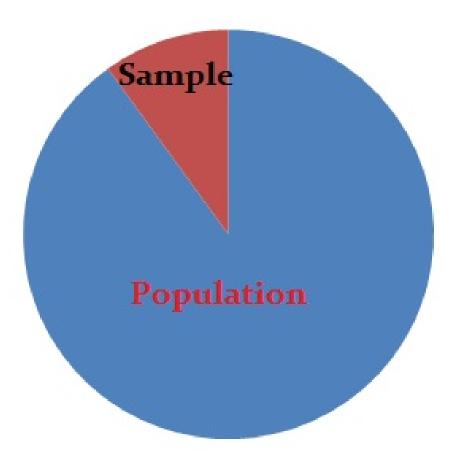






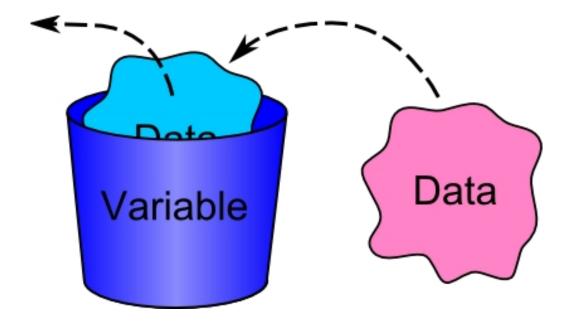
Set of data drawn from population

• Potentially large, but less than population





Variable



Any characteristic, number, or quantity that can be measured or counted

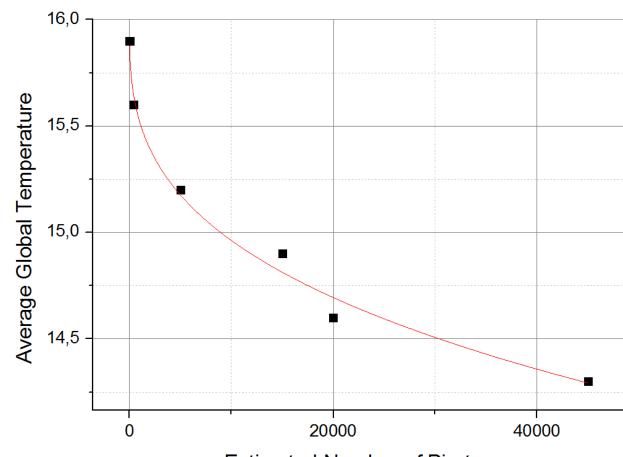
- i.e., "Data item", "Data point"
- Quantity that takes different values in different situations



Causation

Relationship between cause and effect

Correlation ≠ causation



Estimated Number of Pirates



Getting Started



Step 1: Set a Goal



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Providing a Quality Service

- What population(s) will we focus on?
- What are the challenges or unaddressed needs for these patients?
- What do we think we can measurably impact?
- What does the data for these patients look like?
 - Before and after



Step 2: Design the Intervention



Step 2: Design the Intervention

Is Community Paramedicine Safe?

- Work with medical direction
- Collaborate with external stakeholders
- Specific evaluations and interventions for this population

Providing a Quality Service

• Developing infrastructure and partnerships



Step 3: Plan the Tracking



Step 3: Plan the Tracking

What impact do these programs have on other healthcare system providers?

- Commit to thorough and consistent data tracking
- Work with medical direction on appropriate documentation
- Identify a significant array of variables that may be pertinent
 - E.g., distance, time, diagnosis, payer mix, demographics
- Develop mechanism to evaluate core measure of impact



Step 4: Analyze and Verify Data



Step 4: Analyze and Verify Data

Do these program generate savings by reducing total cost of care?

- Determine basic analytics (sums, averages, etc)
- Normalize data to isolate variables

Medical Center

• Define business impact of these findings



Breaking Through

- Is Community Paramedicine safe for patients?
- Are these programs providing quality services recognized by external entities?
- What impact do these programs have on other healthcare system providers?
- Do these program generate savings by reducing total cost of care?



Case Study: Life Lion Community Paramedicine



Case Study: Life Lion Community Paramedicine

- Small-scale pilot program in 2013
- Intriguing concept, but no obvious funding model
- Inspired by emerging Community Paramedicine concepts of reducing super-utilization and readmissions
- Hospital leadership became aware of capabilities
- Subsequent data analysis of challenging populations changed outlook





Case Study: Life Lion Community Paramedicine

Staffing

- 4 FTEs
- 3 paramedic field clinicians
- 1 supervisor

Resources

- 3 repurposed police vehicles
- Basic and specialty equipment load outs
- Cerner communication and documentation access





Goal: Reduce Readmissions

Why?

- Improves patient outcomes and experience
- Lowers healthcare costs
- Enhances population health

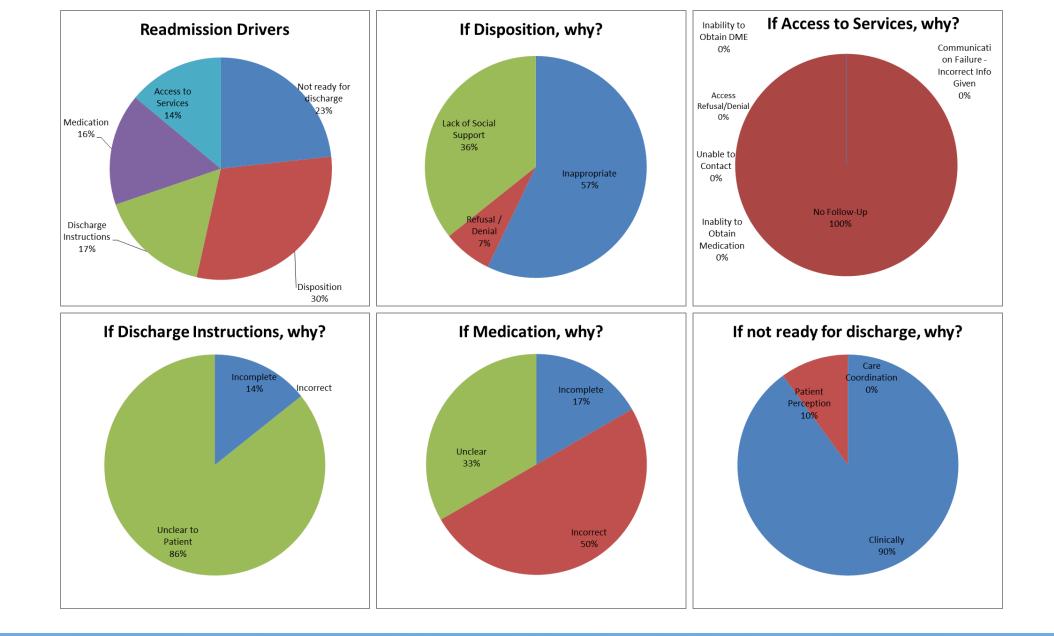
Business drivers

- CMS reducing payments for excess readmission rates
- Commercial payers may incentivize elevated performance

Shared savings contracts

• Readmissions expense is substantial







Goal: Reduce Readmissions

Hospital capacity and cost considerations

- Poor reimbursement in patients readmitted within 30 days
- In saturated hospitals, higher-paying cases may not have access to these beds
- Dramatically increases cost to institution

Patient perspective

- Readmissions result in increased complications
- Overall experience and perception of care worsened

Significant impact on bundle care programs*



Designing the Intervention

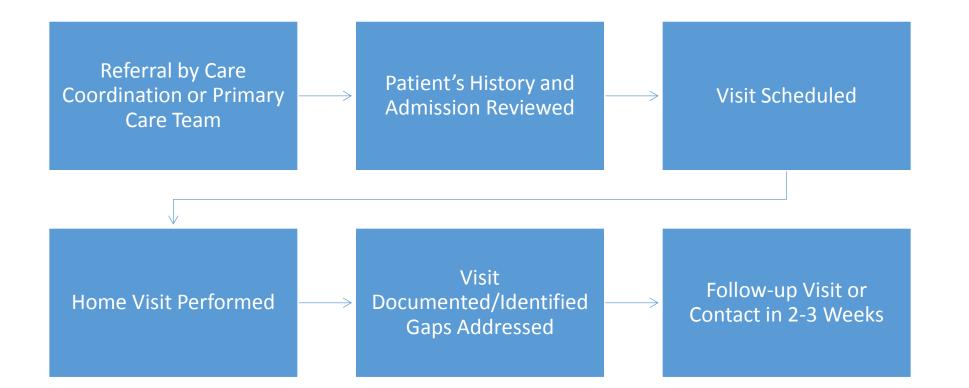
Target Population: All Primary Diagnosis Heart Failure Patients

Exclusions

- Discharge to Skilled Nursing Facility (SNF)
- Discharge to hospice services
- Lives >90 minutes from the Hershey Medical Center



Designing the Intervention





Designing the Intervention

Home Visit

- History leading to admission
- Reviewing and reinforcing discharge instructions
- Thorough physical exam
- Medication reconciliation
- Reinforce medication instructions/disease-specific guidelines
- Provide tools/education to help patients manage their care
- Reinforce communication options
- Provide interventions



Plan the Tracking

- Identify core measure of value
- Maintain comprehensive record of all activity
 - Charting software or separate record
- Identify relevant operational metrics
- Add related clinical measures
- Expand as needed



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	06 Druschel		5E+05	2.7E+07	11/2/2017	10/30/2017	3 days Home	83 Male	Heart failure	Acute decompensated HF	Yes	Cardiology Yes	Yes	Yes	Yes	10:30	10:40	0:10	11:14	0:34	11:14
	07 Grimm			2.7E+07	11/2/2017	10/17/2017	16 days Home	32 Female	Heart failure	Acute diastolic HF	Yes	Cardiology Yes	Yes	Yes	Yes	10:38	10:45	0:07	11:20	0:35	11:39
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	311 Grimm		6E+05	2.7E+07	11/3/2017	10/31/2017	3 days Home	69 Male	Heart failure	Pulmonary Edema Cardiac Cause	No	Internal Medicir Yes	No	No	No	12:00	12:56	0:30	13:35	0:30	13:42
313 3	12 Druschel		3E+06	2.7E+07	11/6/2017	10/10/2017	27 days Home	54 Male	Heart failure	Systolic CHF	Yes	Cardiology Yes	Yes	No	No	11:29	12:45	1:16	13:15	0:30	14:36
	13 Miller		2E+06	2.7E+07	11/7/2017	10/16/2017	22 days Home	63 Female	Heart failure	Ácute on chronic diastolic congestive heart failure	Yes	Internal Medicii Yes	Yes	Yes	Yes	9:26	9:42	0:16	10:33	0:51	10:49
	14 Druschel	1	5E+05		11/7/2017	10/14/2017	24 days Home	84 Male	Heart failure	Respiratory failure	No	Cardiology Yes	Yes	No	No	10:55	11:16	0:21	12:00	0:44	12:21
	15 Miller 16 Druschel		2E+05 2E+06	2.7E+07 2.7E+07	11/8/2017 11/8/2017	10/30/2017 10/13/2017	9 days Home	89 Male 38 Female	Heart failure Heart failure	Heart failure, chronic, with acute decompesnation Systolic CHF, acute on chronic	Yes Yes	Cardiology Yes Cardiology Yes	Yes Yes	Yes No	Yes No	8:52 10:30	9:44 12:38	0:52	10:08 13:05	0:24 0:27	11:04
	16 Druschel 17 Miller		2E+06 5E+05	2.7E+07	11/8/2017	10/13/2017	26 days Home 15 days Home	38 Female 26 Male	Heart failure Heart failure	Systolic UHF, acute on chronic Acute on chronic heart failure	Yes	Cardiology Yes Cardiology Yes	Yes	No	No No	10:30	12:38	2:08	13:05	0:27	13:44
	18 Grimm		2E+06	2.12.01	11/10/2017	11/8/2017	2 days Home	78 Female	Heart failure	Acute Exacerbation of CHF	Yes	Cardiology Yes	Yes	Yes	Yes	10:20	10:43	0:23	11:21	0:38	11:47
	19 Miller		2E+05	2.7E+07	11/13/2017	11/10/2017	3 days Home	61 Male	Heart failure	Acute combined systolic-diastolic congestive heart failure		Cardiology Yes	Yes	No	Yes	8:37	8:55	0:18	10:01	1:06	10:01
	20 Miller		2E+06	2.7E+07	11/13/2017	11/9/2017	4 days Home	40 Female	Heart failure	Hepatic encephalopathy (Recent was HF)	No	Internal Medicit Yes	Yes	No	No	10:01	10:56	0:55	11:32	0:36	12:52
	21 Druschel		2E+06	2.7E+07	11/13/2017	10/31/2017	13 days Home	33 Male	Heart failure	Acute Hypoxemic Respiratory Failure	No	Cardiology Yes	Yes	No	No	9:38	12:09	2:31	12:39	0:30	15:05
	22 Miller		2E+06	2.7E+07	11/14/2017	10/27/2017	18 days Home	42 Female	Heart failure	Sepsis	No	Internal Medicii No	Yes	Yes	Yes No	9:22	9:49	0:27	10:04	0:15	10:20
	23 Grimm 24 Druschel	2	1E+06	2.7E+07 2.7E+07	11/14/2017 11/14/2017	10/22/2017 11/2/2017	23 days Home 12 days Home	45 Female 87 Female	Heart failure Heart failure	Atrial flutter Fall	No	Internal Medicir Yes Internal Medicir Yes	No Yes	No Yes	No Yes	10:04 13:00	10:20	0:16 0:18	10:34 13:58	0:14	11:00 14:14
	24 Druschei 25 Grimm	2		2.7E+07	11/15/2017	10/17/2017	29 days Home	92 Female	Heart failure	raii Acute diastolic HF	Yes	Cardiology Yes	Yes	Tes	Tes Yes	10:32	10:39	0:10	11:12	0:40	11:20
	26 Druschel	1	62877	2012 (VI)	11/15/2017	11/4/2017	11 days Home	73 Male	Heart failure	Acute diastolic III	Yes	Internal Medicit Yes	Yes	Yes	Yes	12:00	12:37	0:37	13:49	1:12	14:27
328 33	27 Grimm	1	3E+06	2.7E+07	11/15/2017	11/10/2017	5 days Home	63 Male	Heart failure	Surgical site infection	No	Internal Medicit Yes	Yes	No	No	13:39	13:47	0:08	14:36	0:49	14:42
	28 Druschel	1	9E+05	2.7E+07	11/16/2017	11/3/2017	13 days Home	53 Male	Heart failure	Acute on chronic left systolic heart failure	Yes	Emergency Mee Yes	Yes	No	No	12:38	12:45	0:07	13:55	1:10	14:01
	29 Miller	1	1E+06	2.7E+07	11/17/2017	11/13/2017	4 days Home	61 Female	Heart failure	Pneumonia	No	FAMCOM No	Yes	No	Yes	9:25	9:47	0:22	10:30	0:43	10:54
	30 Miller 31 Grimm		1E+06 2E+06	2.7E+07 2.7E+07	11/20/2017 11/20/2017	11/13/2017 11/13/2017	7 days Home 7 days Home	61 Female 67 Female	Heart failure Heart failure	Pneumonia A suto secol failure superimposed on stage 4 shronis kidne	No	FAMCOM No Cardiology No	Yes	No	Yes Yes	8:38 9:15	8:56 9:24	0:18 0:09	9:15 9:46	0:19 0:22	9:24 10:23
	31 Grimm 32 Miller		2E+06 3E+07	2.7E+07 2.7E+07	11/20/2017	11/13/2017	7 days Home 13 days Home	57 Female 78 Male	Heart failure Heart failure	Acute renal failure superimposed on stage 4 chronic kidne Huperalucemia	y No No	Cardiology No Cardiology No	Yes Yes	Yes Yes	Yes Yes	3:15 3:46	9:24 10:23	0:09	3:46 10:39	0:22	10:23
	33 Miller		3E+06	2.7E+07	11/20/2017	11/16/2017	4 days Home	60 Male	Heart failure	CAD	No	Cardiology Yes	Yes	No	No	11:50	11:57	0:07	12:19	0:10	12:41
	34 Druschel		3E+07	2.7E+07	11/20/2017	10/26/2017	25 days Home	71 Male	Heart failure	Acute on chronic diastolic heart failure	Yes	Hematology/Or Yes	Yes	No	No	11:00	12:33	1:33	13:02	0:29	14:17
	35 Grimm		3E+06	2.7E+07	11/20/2017	11/16/2017	4 days Home	80 Male	Heart failure	Acute Hypoxemic Respiratory Failure	No	FAMCOM Yes	Yes	Yes	Yes	12:19	12:41	0:22	13:22	0:41	13:50
	36 Grimm		2E+06	2.7E+07	11/21/2017	10/26/2017	26 days Rehab	90 Female	Heart failure	Acute diastolic HF	Yes	Cardiology Yes	No	Yes	Yes	10:58	11:01	0:03	11:43	0:42	11:48
	37 Miller		7E+05	2.7E+07	11/21/2017	11/18/2017	3 days Home	65 Male	Heart failure	AS	No	Cardiac surger(Yes	Yes	No	No	10:22	10:47	0:25	11:47	1:00	12:13
	38 Druschel 39 Grimm	2	5E+05 1E+06	2.7E+07	11/21/2017 11/21/2017	10/14/2017	38 days Home 28 days Rehab	84 Male 56 Male	Heart failure Heart failure	Respiratory failure Shock	No	Cardiology Yes Cardiology Yes	Yes No	No Yes	No Yes	11:07 13:04	11:17 13:23	0:10 0:19	11:40 14:07	0:23	11:50 14:43
	39 Grimm 40 Druschel	1	1E+06 1E+05	2.7E+07	11/21/2017	10/24/2017	20 days Hehab 8 days Home	57 Female	Heart failure Heart failure	Shock Heart failure	Yes	FAMCOM No	No Yes	Tes	Tes Yes	13:04	13:23	0:19	14:07	0:44	14:43
	41 Druschel	1	2E+06	2.7E+07	11/21/2017	11/18/2017	3 days Home	60 Female	Heart failure	Diastolic CHF, acute on chronic	Yes	Cardiology Yes	Yes		·····	H	12.00	0:00	,0.00	0:00	10.40
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	43 Wattai		2E+06	2.7E+07	11/22/2017	11/16/2017	6 days Home	77 Female	Heart failure	Acute diastolic congestive heart failure	Yes	FAMCOM Yes	Yes	No	No	12:35	12:58	0:23	14:30	1:32	15:30
	44 Grimm		2E+06	2.7E+07	11/24/2017	11/18/2017	6 days Home	60 Male	Heart failure	CHF Exacerbation	Yes	Cardiology Yes	Yes	Yes	Yes	9:42	9:48	0:06	10:10	0:22	10:19
	45 Grimm 46 Miller	1	6E+05	2.7E+07 2.7E+07	11/24/2017	11/21/2017	3 days Home E days Home	75 Male 81 Female	Heart failure Heart failure	Acute CHF	Yes	Internal Medicir Yes Internal Medicir Yes	Yes	No Yes	No	12:30 8:34	12:45 8:48	0:15 0:14	13:10 9:49	0:25	13:25 10:03
	46 Miller 47 Druschel	1	1E+06	2.7E+07 2.7E+07	11/27/2017	11/22/2017	5 days Home 5 days Home	81 Female 78 Male	Heart failure Heart failure	Acute hypoxic respiratory failure secondary to new onset Acute on chronic congestive heart failure	s Yes Yes	Internal Medicii Yes Cardiology Yes	Yes Yes	Yes Yes	Yes Yes	8:34 9:17	8:48 9:46	0:14 0:29	9:49 10:18	1:01	10:03 10:46
	41 Druschei 48 Grimm	2	3E+06	2.7E+07	11/27/2017	10/30/2017	28 days Home	32 Female	Heart failure	Acute on chronic congestive heart railure Postpartum cardiomyopathy	No	FAMCOM Yes	Yes	Tes	Tes	10:31	3:46 10:49	0:23	11:07	0:32	11:28
	43 Miller	1	3E+06	2.7E+07	11/27/2017	11/17/2017	10 days Home	40 Female	Heart failure	Acute Hypoxemic Respiratory Failure	No	Internal Medicii Yes	Yes	No	No	12:30	12:55	0:25	14:30	1:35	15:00
51 3	50 Grimm	2	6E+05	2.7E+07	11/27/2017	10/31/2017	27 days Home	69 Male	Heart failure	Pulmonary Edema Cardiac Cause	No	Internal Medicii Yes	No	No	No	13:26	13:41	0:15	14:10	0:29	14:27
	51 Grimm	1	2E+06	2.8E+07	11/28/2017	11/24/2017	4 days Home	91 Female	Heart failure	Aortic stenosis	No	Cardiology Yes	Yes	No	No	8:49	8:57	0:08	9:40	0:43	9:50
	52 Druschel	2	6E+05	2.7E+07	11/28/2017	11/7/2017	21 days Home	85 Female	Heart failure	Pleuritic chest pain	No	Cardiology Yes	Yes	No	No	10:00	10:38	0:38	11:13	0:35	12:32
	53 Grimm 54 Druschel	1	2E+05 2E+06	2.7E+07 2.7E+07	11/28/2017 11/29/2017	11/18/2017 11/25/2017	10 days Home	58 Male 30 Female	Heart failure Heart failure	Acute Congestive Heart Failure CO2 narcosis	Yes No	Internal Medicii Yes Internal Medicii Yes	Yes Yes	No Yes	No Yes	13:35 13:18	13:46 13:44	0:11 0:26	14:05 14:44	0:19	14:10 15:15
	54 Uruschel 55 Druschel		2E+06	2.7E+07 2.7E+07	11/29/2017	11/25/2017	4 days Home 7 days Home	30 Female 73 Male	Heart failure Heart failure	CU2 narcosis Acute renal failure	No	Internal Medicit Yes	Tes Yes	Tes No	Tes No	13:18	13:44	0:26	14:44	1:00	15:15
	56 Grimm		2E+06	2.8E+07	12/1/2017	11/24/2017	7 days Home	58 Male	Heart failure	Acute congestive heart failure	Yes	Internal Medicit Yes	No	No	No	10:42	11:08	0:26	11:25	0:42	12:11
	57 Druschel	1	1E+06	2.7E+07	12/1/2017	11/15/2017	16 days Home	51 Male	Heart failure	Acute Hypoxemic Respiratory Failure	Yes	Internal Medicir No	Yes	Yes	Yes	12:14	12:42	0:28	13:15	0:33	13:33
	58 Grimm	1	1E+06	2.7E+07	12/1/2017	11/13/2017	18 days Rehab	79 Male	Heart failure	Acid reflux	No	Internal Medicii Yes	No	Yes	Yes	12:30		#####	14:14	1:48	14:45
	59 Grimm		2E+06	2.8E+07	12/4/2017	11/28/2017	6 days Home	67 Female	Heart failure	Acute diastolic congestive heart failure	Yes	FAMCOM Yes	Yes	Yes	Yes	12:45	13:01	0:16	13:31	0:30	13:42
	50 Grimm		3E+05	2.8E+07	12/5/2017	12/1/2017	4 days Home	73 Male	Heart failure	Diastolic CHF, acute on chronic	Yes	Cardiology No	Yes	No	No	8:43	8:54	0:11	9:58	1:04	10:11
	61 Druschel 52 Grimm		7E+06 3E+05	1E+08 2.8E+07	12/5/2017 12/5/2017	12/1/2017	4 days Home 3 days Home	82 Male 79 Female	Heart failure Heart failure	Acute on chronic systolic CHF Critical aortic valve stenosis	Yes	Internal Medicir No Cardiology No	Yes No	Yes Yes	Yes Yes	12:20 13:30	12:40 13:45	0:20	13:18 14:20	0:38	13:56 14:35
	62 Grimm 63 Druschel		4E+05	2.8E+07	12/6/2017	11/29/2017	7 days Home	34 Male	Heart failure	Critical aortic valve stenosis Acute on chronic diastolic heart failure	Yes	Cardiology No Cardiology Yes	Yes	No	Tes No	13:30	13:45	0:15	14:20	0:35	14:35
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	65 Grimm		1E+06	2.8E+07	12/7/2017	12/5/2017	2 days Home	74 Male	Heart failure	Acute on chronic diastolic CHF	Yes	FAMCOM Yes	Yes	No	No	9:15	9:50	0:35	10:25	0:35	11:00
	56 Druschel	1	9E+05	2.8E+07	12/7/2017	11/21/2017	16 days Home	59 Male	Heart failure	CHF Exacerbation	Yes	Cardiology Yes	Yes	No	No	12:40	12:45	0:05	13:15	0:30	13:22
	67 Druschel	1		2.8E+07	12/8/2017	12/1/2017	7 days Home	86 Male	Heart failure	Rapid a-fib	No	Cardiology Yes	Yes	No	No	10:30	10:42	0:12	11:18	0:36	11:24
	58 Druschel	1	1E+05	2.7E+07	12/8/2017	11/17/2017	21 days Home	74 Female	Heart failure	CHF	Yes	FAMCOM No	Yes	No	No	12:29	12:45	0:16	13:18	0:33	13:30
	59 Druschel 70 Druschel		3E+06	2.8E+07	12/11/2017 12/12/2017	11/20/2017	21 days Home 29 days Home	54 Male 57 Female	Heart failure Heart failure	AKI Haart failura	No Yes	Cardiology Yes FAMCOM No	No Xee	No Yes	No Yes	11:00 10:01	12:40 10:40	1:40 0:39	13:33 11:15	0:53 0:35	14:43 11:47
3	TO Druschel	2	1E+05	2.7E+07	izrizizuti	11/13/2017	29 days Home	57 Female	Heart failure	Heart failure	1 65		Yes	; 1 05	Yes	10:01	10:40	0:33	1015	0:35	1041
	► Ma	aster HF	Loa	Maste	er Stroke Lo	og Ana	alytics Challer	iges All	Declines	Proce: (+) : (+)											
						2															

Population Profile (Heart Failure)

Age

- Mean: 69.75
- Median: 72.00
- Std. Deviation: 14.47 (68% between 55.28 and 84.22)

Gender

- Male: 55.53%
- Female: 44.48%

Home Health/Bed-Bound

• 43.27%

Payer Mix

• 65%: Medicare, 20% commercial, 9% Medicaid



Population Profile (Heart Failure)

ſ	failure		. 1	. 1	10.0
	Acute congestive heart failure	1	.1	.1	16.1
	Acute Congestive Heart Failure	1	.1	.1	16.2
	Acute congestive heart failure 150.9	2	.2	.2	16.3
	Acute Congestive Heart Failure with Left Venticular Diastolic Dysfunction	2	.2	.2	16.5
	Acute cor pulmonale 126. 09	1	.1	.1	16.6
	Acute decompensated heart failure	1	.1	.1	16.6
	Acute decompensated heart failure 150.9	2	.2	.2	16.8
	Acute decompensated HF	2	.2	.2	16.9
	Acute diastolic (congestive) heart failure	1	.1	.1	17.0
	Acute diastolic (congestive) heart failure I50.31	3	.2	.2	17.2
	Acute diastolic CHF (congestive heart failure)	1	.1	.1	17.3
	Acute diastolic congestive heart failure	2	.2	.2	17.5
	Acute diastolic heart failure	4	.3	.3	17.8
	Acute diastolic heart failure 150.31	2	.2	.2	17.9
	Acute diastolic HF	8	.6	.6	18.5
	Acute diastolic HF (heart failure) 150.31	1	.1	.1	18.6
	Acute encephalopathy	1	.1	.1	18.7
	Acute encephalopathy G93.40	1	.1	.1	18.8
	Acute exacerbation of	0	6	e	10.4

Acute exacerbation of CHF	8	.6	.6	19.4
Acute Exacerbation of CHF	25	1.9	1.9	21.2
Acute exacerbation of CHF (congestive heart failure)	6	.5	.5	21.7
Acute exacerbation of CHF (congestive heart failure) 150.9	20	1.5	1.5	23.2
Acute exacerbation of chronic obstructive pulmonary disease	1	.1	.1	23.3
Acute exacerbation of congestive heart failure	5	.4	.4	23.6
Acute exacerbation of congestive heart failure I50.9	14	1.1	1.1	24.7
Acute exacerbation of COPD with asthma	1	.1	.1	24.8
Acute GI bleeding K92.2	1	.1	.1	24.8
Acute heart failure	1	.1	.1	24.9
Acute heart failure 150.9	1	.1	.1	25.0
Acute heart failure exacerbation	1	.1	.1	25.1
Acute heart failure with normal ejection fraction	1	.1	.1	25.2
Acute HF	1	.1	.1	25.2
Acute HF (heart failure) I50.9	4	.3	.3	25.5



Making Sense of the Chaos

Determining Readmission Rates

- 1. Identify what patients constitute target population
- 2. Determine sample that received CP services
- 3. Separate patients that did not
- 4. Determine what patients in each category were readmitted
- 5. Rate: Readmits/Total Seen



Target Population

Primary Heart Failure								
111.0	Hypertensive heart disease with heart failure							
113.0	Hypertensive heart and chronic kidney disease with heart failure and stage 1 through stage 4 chronic kidney disease, or unspecified chronic kidney disease							
113.2	Hypertensive heart and chronic kidney disease with heart failure and with stage 5 chronic kidney disease, or end stage renal disease							
150.1	Left ventricular failure							
150.20	Unspecified systolic (congestive) heart failure							
150.21	Acute systolic (congestive) heart failure							
150.22	Chronic systolic (congestive) heart failure							
150.23	Acute on chronic systolic (congestive) heart failure							
150.30	Unspecified diastolic (congestive) heart failure							
150.31	Acute diastolic (congestive) heart failure							
150.33	Acute on chronic diastolic (congestive) heart failure							
150.41	Acute combined systolic (congestive) and diastolic (congestive) heart failure							
150.43	Acute on chronic combined systolic (congestive) and diastolic (congestive) heart failure							
150.9	Heart failure, unspecified							



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7	□ 2019	4/	4	·	4'		Aug	3	20			Aug	9			_	Aug	Fac Code	
8		<u> </u>	8 43				Sep	3	21			Sep	5			-	Sep	Facility	
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10		<u> </u>	7 51				Nov	4	23		-	Nov	8			-	Nov	Universal ID	
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24	1	,, , ,, , ,, , , , , , , , , , , , , , , , , , , ,		I	/		PDX /	HF Apr17-Apr19	.9 (CP, Norm7	alized)	í′	PDX HF	Apr17-Apr1	9 (No CP, Norm	nalized)		PDX HF		Readmit
25		Financial Impact Mo	/lodel (FY 19-20'	1			Month	Readmit	Total	Rate	1	Month	Readmit	Total	Rate		Month	СР 🔻	-
26	/	Principle Diagnosis Heart	With CP	No CP			Apr	2	23	8.70%	1′	Apr	2	14	14.29%		Apr	Facility DC Di 🔻	
27	/	Failure (HF)	(Normalized)	(Normalized)			May	3	20	15.00%	<u>ا</u>	May	5	36	13.89%		May		
28	1	Total Patients	213	316			Jun	2	25	8.00%	<u>،</u> ا	Jun	14	33	42.42%		Jun		
29	1	Readmission rate	10.33%	26.58%			Jul	1	17	5.88%	1′	Jul	6	24	25.00%		Jul		
30		Readmissions	22.0029	83.9928			Aug	4	19	21.05%	1′	Aug	4	30	13.33%		Aug	■ ROWS	Σ VALUES
31		Readmissions if opposite applied	56.62	32.64			Sep	2	22	9.09%	1′	Sep	11	25	44.00%		Sep	Years 👻	Count of A
32		Potential readmissions prevented	34.61	51.35			Oct	5	19	26.32%	4′	Oct	4	23	17.39%		Oct	End Dt •	Counterra
33	1	Average length of stay	6	6			Nov	4	18	22.22%	1′	Nov	14	29	48.28%		Nov	Line by	



LLEMS Community Paramedicine Readmission Impact

- April 2017-April 2019
- Compares PDX HF patients with CP services vs. those without
- Data extracted from MIDAS Readmission Toolpack reporting
- Verified against Vizient data

Cumulative PDX HF (With CP)								
Month	Readmits	Total Seen	Rate					
Apr	1	24	4.17%					
May	5	23	21.74%					
Jun	2	28	7.14%					
Jul	1	17	5.88%					
Aug	4	19	21.05%					
Sep	2	22	9.09%					
Oct	5	22	22.73%					
Nov	4	20	20.00%					
Dec	2	24	8.33%					
Jan	4	23	17.39%					
Feb	4	29	13.79%					
Mar	2	34	5.88%					
Apr	3	24	12.50%					
May	3	34	8.82%					
Jun	2	24	8.33%					
Jul	3	31	9.68%					
Aug	3	22	13.64%					
Sep	3	21	14.29%					
Oct	3	22	13.64%					
Nov	4	22	18.18%					
Dec	4	19	21.05%					
Jan		20	0.00%					
Feb	1	22	4.55%					
Mar	1	25	4.00%					
Apr	1	19	5.26%					
Total	67	590	11.36%					

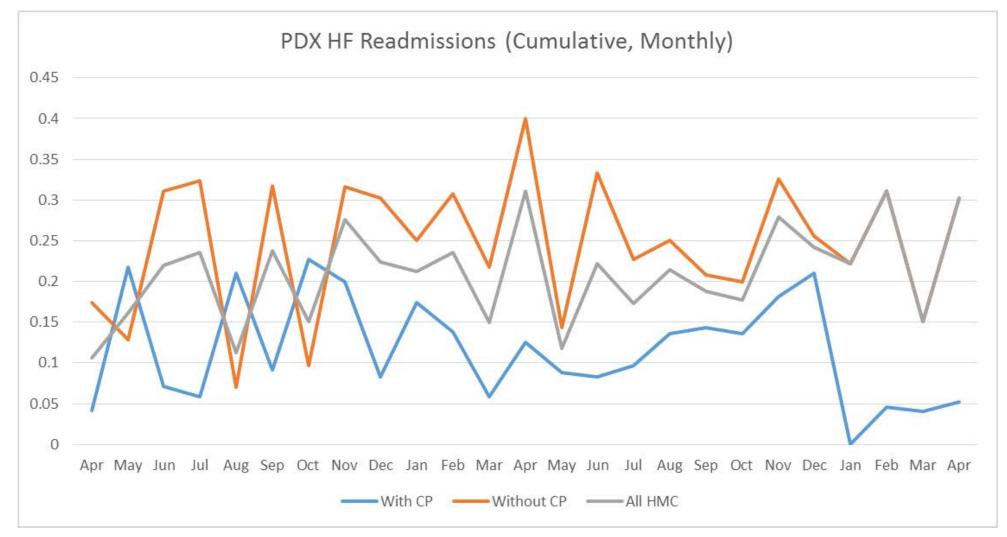
Cumulative PDX HF (NO CP)									
Month	Readmits	Total Seen	Rate						
Apr	4	23	17.39%						
May	5	39	12.82%						
Jun	14	45	31.11%						
Jul	11	34	32.35%						
Aug	3	43	6.98%						
Sep	13	41	31.71%						
Oct	3	31	9.68%						
Nov	12	38	31.58%						
Dec	13	43	30.23%						
Jan	6	24	25.00%						
Feb	12	39	30.77%						
Mar	10	46	21.74%						
Apr	20	50	40.00%						
May	6	42	14.29%						
Jun	10	30	33.33%						
Jul	10	44	22.73%						
Aug	12	48	25.00%						
Sep	10	48	20.83%						
Oct	8	40	20.00%						
Nov	15	46	32.61%						
Dec	11	43	25.58%						
Jan	12	54	22.22%						
Feb	14	45	31.11%						
Mar	8	53	15.09%						
Apr	16	53	30.19%						
Total	258	1042	24.76%						

Source: MIDAS Readmission Standard Reporting

Cumulative PDX HF (All HMC)										
Month	Readmits	Total Seen	Rate							
Apr	5	47	10.64%							
May	10	62	16.13%							
Jun	16	73	21.92%							
Jul	12	51	23.53%							
Aug	7	62	11.29%							
Sep	15	63	23.81%							
Oct	8	53	15.09%							
Nov	16	58	27.59%							
Dec	15	67	22.39%							
Jan	10	47	21.28%							
Feb	16	68	23.53%							
Mar	12	80	15.00%							
Apr	23	74	31.08%							
May	9	76	11.84%							
Jun	12	54	22.22%							
Jul	13	75	17.33%							
Aug	15	70	21.43%							
Sep	13	69	18.84%							
Oct	11	62	17.74%							
Nov	19	68	27.94%							
Dec	15	62	24.19%							
Jan	12	54	22.22%							
Feb	14	45	31.11%							
Mar	8	53	15.09%							
Apr	16	53	30.19%							
Total	322	1546	20.83%							

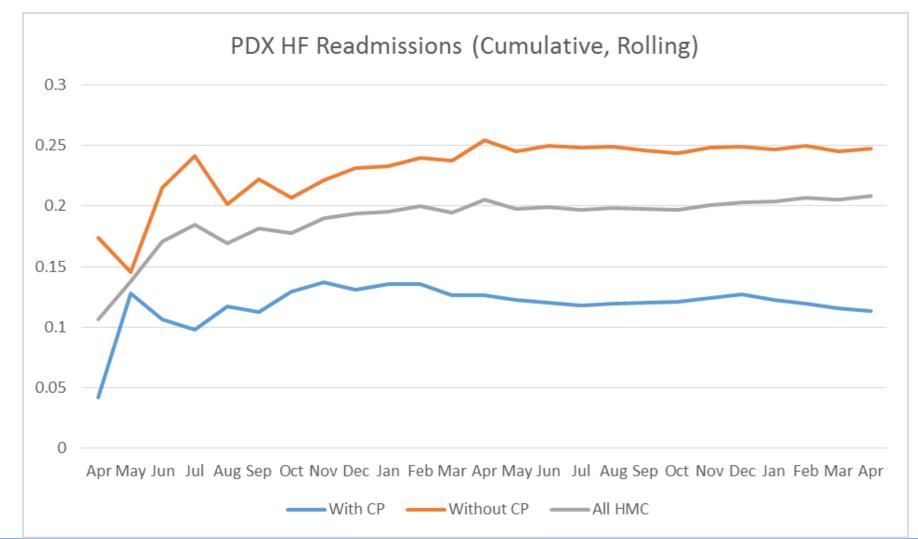


LLEMS Community Paramedicine Readmission Impact





LLEMS Community Paramedicine Readmission Impact





LLEMS Community Paramedicine Normalization

Trends

- A substantial gap has been consistently observed between patients that have received CP services versus those that have not.
- Notable gap between patients not been by CP and total HMC HF readmit rate

Variables

• Concern regarding if these two groups are truly comparable, or if other factors may be variables skewing the trends. (CAUSATION)

Normalization

- The following exercise focused on removing patients ineligible for CP services from the group of those that did not receive a visit, and ensured both groups had a comparable level of severity via a Case Mix Index score (CMI).
- Ultimately, the goal was to ensure that a CP home visit was the only major variable separating the two groups.



LLEMS Community Paramedicine Normalization

PDX HF With CP To Date (Monthly)								
Apr	2	24	8.33%					
May	5	23	21.74%					
Jun	2	28	7.14%					
Jul	1	17	5.88%					
Aug	4	19	21.05%					
Sep	2	22	9.09%					
Oct	5	22	22.73%					
Nov	4	20	20.00%					
Dec	2	23	8.70%					
Jan	4	23	17.39%					
Feb	4	29	13.79%					
Mar	3	37	8.11%					
Apr	3	23	13.04%					
May	3	33	9.09%					
June	2	24	8.33%					
July	3	31	9.68%					
Aug	3	22	13.64%					
	52	420	12.38%					

PDX HF WITHOUT CP To Date

Primary Diagnosis Heart Failure: April 2017-August 2018

(Monthly)									
Apr	4	23	17.39%						
May	6	39	15.38%						
Jun	15	45	33.33%						
Jul	11	33	33.33%						
Aug	5	43	11.63%						
Sep	14	41	34.15%						
Oct	4	31	12.90%						
Nov	15	38	39.47%						
Dec	14	43	32.56%						
Jan	6	24	25.00%						
Feb	13	39	33.33%						
Mar	10	47	21.28%						
Apr	20	52	38.46%						
May	6	43	13.95%						
June	9	30	30.00%						
July	10	44	22.73%						
Aug	12	47	25.53%						
	174	662	26.28%						

PDX HF All HMC To Date (Monthly)

Apr	6	47	12.77%
May	11	62	17.74%
Jun	17	73	23.29%
Jul	12	50	24.00%
Aug	9	62	14.52%
Sep	16	63	25.40%
Oct	9	53	16.98%
Nov	19	58	32.76%
Dec	16	66	24.24%
Jan	10	47	21.28%
Feb	17	68	25.00%
Mar	13	84	15.48%
Apr	23	75	30.67%
May	9	76	11.84%
June	11	54	20.37%
July	13	75	17.33%
Aug	15	69	21.74%
	226	1082	20.89%



LLEMS Community Paramedicine Normalization

- The below population adjustments include only discharge to home, comparable length of stay, demographics, and primary diagnosis heart failure.
- CMI values were identified through Vizient reporting, using acute inpatient encounter numbers of primary diagnosis HF patients.
- This establishes the logical model that can be translated into financial impact.

	Population Comparison		
	With CP Visit	Without CP Visit	
Number of Encounters	274	296	
СМІ	1.4605	1.4728	
	Commercial: 20% Medicare: 65%	Commercial: 20% Medicare: 65%	
Payer Mix	Medicaid: 9%	Medicaid: 9%	
Age	60% >65	60% >65	
Gender	F: 40%, M: 60%	F: 38%, M: 62%	



LLEMS Community Paramedicine Normalized Readmission Impact

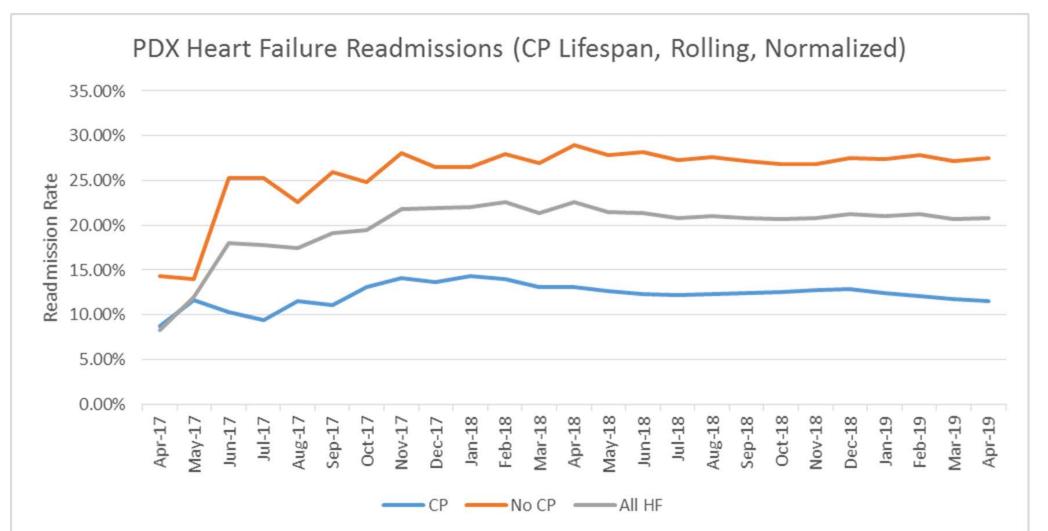
- Only compares patients discharged to home
- Identical CMI
- Identical payer mix
- Identical demographics
- Identical length of stay
- Identical geographic spread

PDX HF Apr17-Apr19 (CP, Normalized)			
Month	Readmit	Total	Rate
Apr	2	23	8.70%
May	3	20	15.00%
Jun	2	25	8.00%
Jul	1	17	5.88%
Aug	4	19	21.05%
Sep	2	22	9.09%
Oct	5	19	26.32%
Nov	4	18	22.22%
Dec	2	20	10.00%
Jan	4	20	20.00%
Feb	3	25	12.00%
Mar	2	31	6.45%
Apr	3	23	13.04%
May	3	34	8.82%
June	2	24	8.33%
July	3	30	10.00%
Aug	3	20	15.00%
Sep	3	21	14.29%
Oct	3	21	14.29%
Nov	4	23	17.39%
Dec	3	17	17.65%
Jan	0	20	0.00%
Feb	1	20	5.00%
Mar	1	22	4.55%
Apr	1	19	5.26%
Total	64	553	11.57%

PDX H	PDX HF Apr17-Apr19 (No CP, Normalized)		
Month	Readmit	Total	Rate
Apr	2	14	14.29%
Мау	5	36	13.89%
Jun	14	33	42.42%
Jul	6	24	25.00%
Aug	4	30	13.33%
Sep	11	25	44.00%
Oct	4	23	17.39%
Nov	14	29	48.28%
Dec	6	35	17.14%
Jan	5	19	26.32%
Feb	10	22	45.45%
Mar	5	29	17.24%
Apr	17	36	47.22%
May	3	26	11.54%
Jun	7	20	35.00%
July	5	32	15.63%
Aug	9	26	34.62%
Sep	5	26	19.23%
Oct	7	32	21.88%
Nov	8	30	26.67%
Dec	12	32	37.50%
Jan	8	31	25.81%
Feb	13	37	35.14%
Mar	6	37	16.22%
Apr	11	33	33.33%
Total	197	717	27.48%



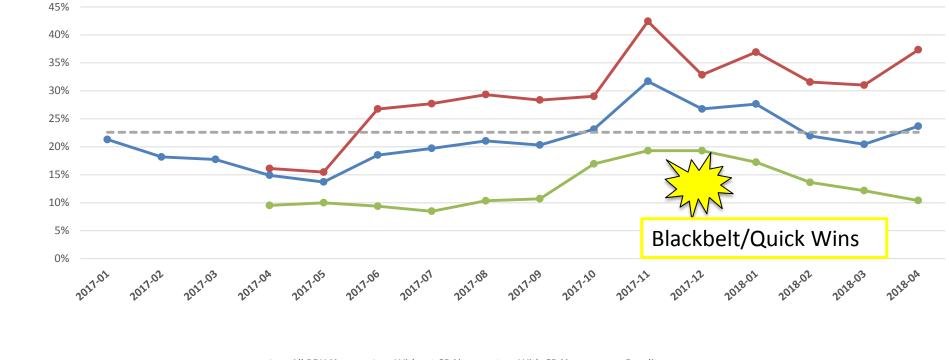
LLEMS Community Paramedicine Normalized Readmission Impact





Course Corrections

30 Day Readmission Rates Rolling 3 Months



All PDX % — Without CP % — With CP % – – Baseline



30 Day Readmission Rate

Financial Impact



PennState Health Milton S. Hershey Medical Center

Changing Realities

- Originally launched with bundle care initiative dynamic
 - Value predicated on improved outcomes
- Same question, different approach
 - What direct impact does prevented readmissions have on hospital financial picture?

A New Approach

Hospital opportunity bed days



Financial Impact Model

With Com	nmunity Paramedicine	Without Cor	mmunity Paramedicine
1a.		1b.	
2a.		2b.	
3a.	(1a*2a)	3b.	(1b*2b)
4a.	(1a*2b)	4b.	(1b*2a)
5a.	(4a-3a)	5b.	(3b-4b)
6a.	(Provided)	6b.	(Provided)
7a.	(5a*6a)	7b.	(5b*6b)
8a.	(Provided)	8b.	(Provided)
9a.	(7a*8a)	9b.	(7b*8b)
	 1a. 2a. 3a. 4a. 5a. 6a. 7a. 8a. 	2a. 3a. (1a*2a) 4a. (1a*2b) 5a. (4a-3a) 6a. (Provided) 7a. (5a*6a) 8a. (Provided)	1a. 1b. 2a. 2b. 3a. (1a*2a) 3b. 4a. (1a*2b) 4b. 5a. (4a-3a) 5b. 6a. (Provided) 6b. 7a. (5a*6a) 7b. 8a. (Provided) 8b.

Opportunity



Financial Impact Model Using Cumulative PDX HF Readmission Rates

	With Community Paramedicine	Without Community Paramedicine
a) Total Patients	553	717
b) Readmission Rate	11.57%	27.48%
c) Readmissions	63.9821	197.0316
d) Readmissions if Opposite Applied	151.96	82.96
e) Potent Readmission Prevented	87.98	114.07
f) Average Length of Stay	6	6
g) Opportunity Bed Days	527.89	684.45
h) Average Estimated Cost of Opp. Day	\$2,000*	\$2,000*
i) Impact to Direct Contribution Margin	\$1,055,780	\$1,368,900
		Opportunity

Opportunity

*Cannot share specific figure. This is a theoretical value based on historical bundled readmission costs that demonstrate principle



Important Notes

- This is **ONE** possible goal and **ONE** definition of impact
- Only includes primary diagnosis heart failure discharged home
- Ongoing conversations surrounding other forms of impact
- Rapidly changing healthcare landscape may change this outlook and present other opportunities



Summary

- Community Paramedicine is a versatile clinical tool with many potential applications
- Comprehensive planning necessary to identify and demonstrate value
- Collaboration with health systems and payers has enormous opportunity
- Future evolutions in payer recognition of model likely to increase opportunities to develop and maintain Community Paramedicine initiatives



Questions?



PennState Health Milton S. Hershey Medical Center





PennState Health Milton S. Hershey Medical Center

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