



Real-Time Data Reduces Readmissions and Improves Patient Care

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Cookeville, Tennessee



Meet Our Presenter



Buffy Key
Senior Vice President
Quality and Operations



Learning Objectives

Identify tools to predict patient readmission in targeted conditions, thereby improving financials.

Demonstrate how data visualization positively impacts clinical decisions and outcomes.

Discuss how data is utilized to benefit the welfare of patients.



Exceptional Care to Every Patient Every Day

Building Healthier Communities

- 247 bed regional referral center
- Located in Cookeville, Tennessee
- Serves 14 county region of over 350,000 residents in upper Cumberland Region of Middle Tennessee
- 60% Medicare population
- 2017 readmissions
 - n=13,200
 - 1,239 total
 - 790 Medicare



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Exceptional Care to Every Patient Every Day

52,503

Emergency
Room Visits



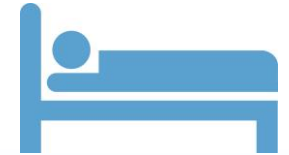
1,504

Newborn
Deliveries



12,893

Inpatient
Admissions



162,392

Outpatient
Visits



8,049

Surgeries



3,954

Heart
Procedures



195

Physicians



2,214

Employees



169

Volunteers



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The High Cost of Readmissions

2 million

patients readmitted
each year



\$27 billion

in Medicare costs of
readmissions

\$17 billion

classified as **potentially
avoidable**

\$428 million

total fines to hospitals in 2015

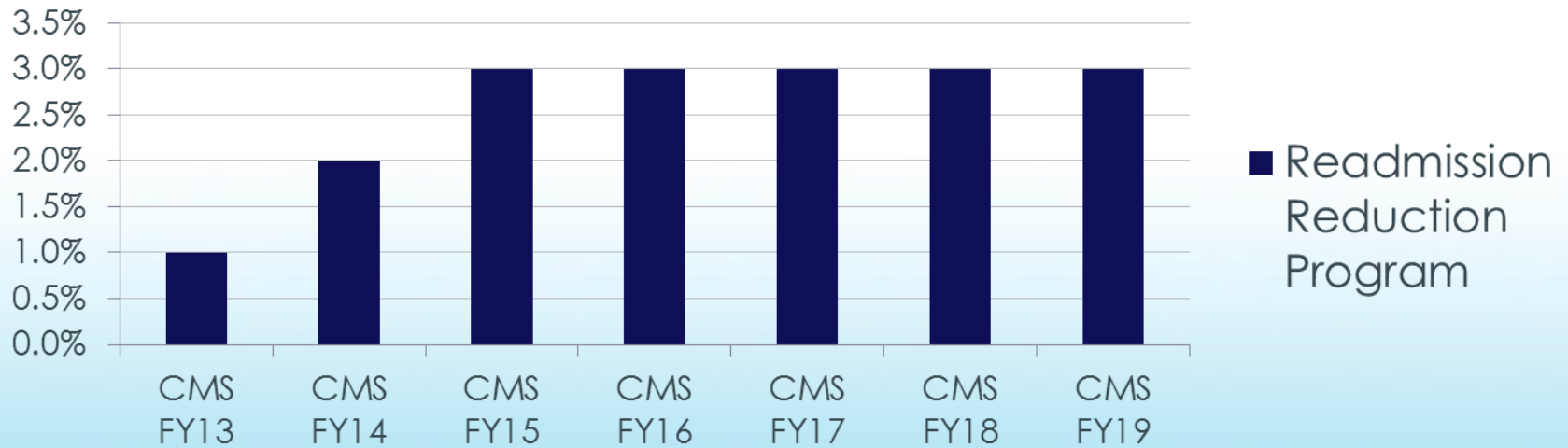
In 2016, only **23.5%**
of hospitals performed well
enough to avoid a penalty



Source: <http://www.nic.org/blog/readmissions-medicare-whats-the-cost/>



Medicare Payments at Risk





Our Challenge

**Readmission
penalty
historically
over \$300k**

Transitional Care Coordinator spent only ½ day with patients, other ½ day calculating LACE scores and performing risk stratification

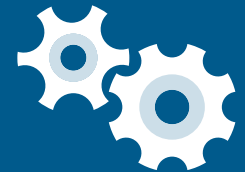


*Monthly
predictive
modeling
report*



Lacked tools to predicts readmissions in targeted conditions, which would improve overall financials

**Siloed data across multiple
departments**



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Historic Readmission Rates

Readmission Rates | Numerator Detail | Denominator Detail: Indexed Admissions | RRP Measure Trends | Rates by Cohort | RRP Scorecard | RRP Top Opportunities | RRP Penalties

Guide Your Analysis

Updated as of Date: 06/29/2016

Discharge Date Initial Encounter: All, 2014, 2015, 2016

Financial Class: (All) 8 values

Area of Interest: (All) 35 values

Readmission Type: HWR All | Starting Date Range: 04/02/2014 | Ending Date Range: 06/29/2016

Readmission HWR All

Year	Quarter	Readmit Rate
2014	Q2	11.8%
2014	Q4	13.9%
2015	Q1	15.5%
2015	Q3	14.5%
2015	Q4	18.0%
2016	Q1	15.0%
2016	Q2	14.0%

Discharge DateTime (Quarter) +

Impact Readmission Analysis for HWR All

Readmit Rate	Total Cost	Total Pt Days	Total Cost per Day
14.5 %	\$9,315,914	5,887	\$1,582

Area of Interest: Service Group | Min Sample Size: 400

Readmission Rate by Area of Interest

Area of Interest	Readmit Rate	Index Admissions
Cardiac Invasive	~7.5%	~450
Neurology	~14.5%	~850
Nephrology	~14.5%	~900
Infectious Diseases	~14.5%	~1,100
Gastroenterology	~14.5%	~1,350
Cardiology General	~14.5%	~1,800
Pulmonary	~15.5%	~2,300

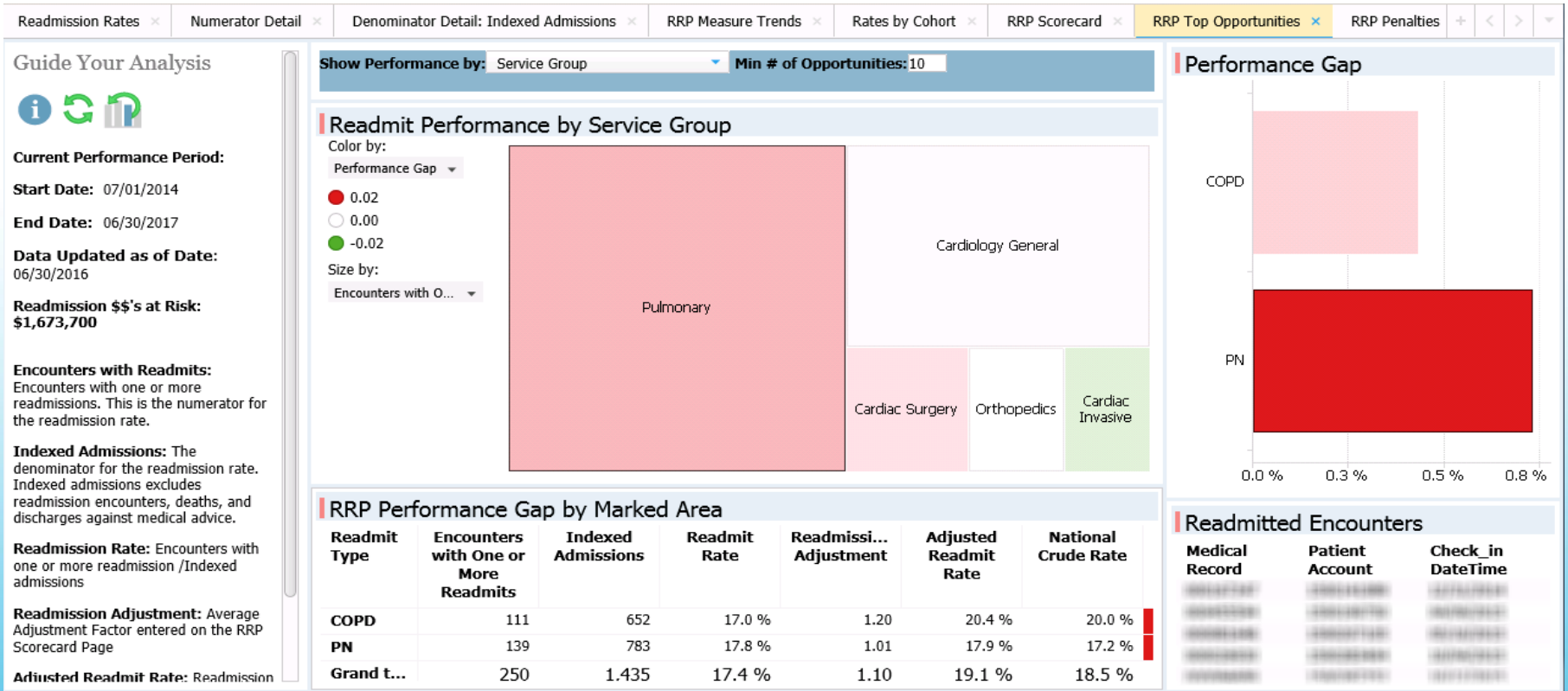
Summary Table for HWR All

Year	Quar...	Month	Index Admissions	Encounters w/One or More Readmission	# of Readmit Encounters	Readmit Rate
2014	Q2	Apr	337	41	51	12.2 %
		May	364	49	57	13.5 %
		Jun	355	35	39	9.9 %
2014	Q3	Jul	317	40	44	12.6 %
		Aug	378	60	69	15.9 %
		Sep	349	44	54	12.6 %
2014	Q4	Oct	354	47	49	13.3 %



Readmission Reduction Program

Top Opportunities





Measures of Success



Clinical
effectiveness



Financial
performance



Community
impact



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Clinical Effectiveness



- Reduce readmissions
- Profile patients and assign LACE score
- Real-time intervention worklist
- Condition specific risk models



Transitional Care Program

Help patients with chronic obstructive pulmonary disease (COPD), congestive heart failure (CHF) and pneumonia to transition from inpatient and reduce risk of readmission

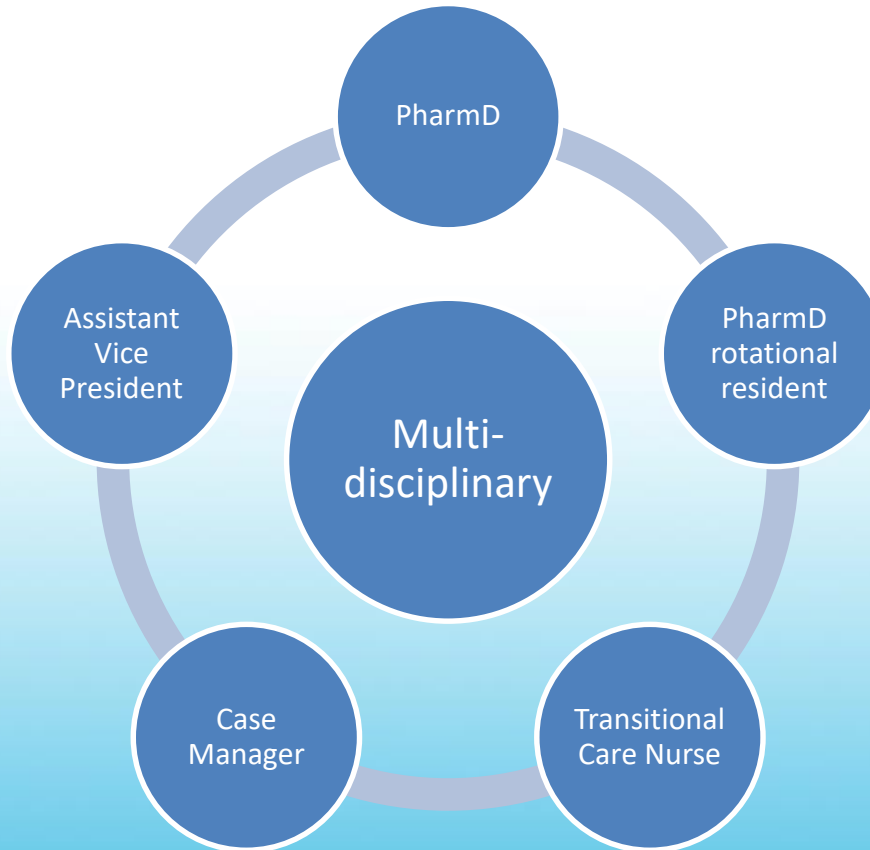


Transitional care coach assigned in hospital and for follow-up calls

Patients obtain increased knowledge and confidence of managing disease and medications



Transitional Care Team





Historical Readmission Rate vs. LACE Score

missions x RRP Measure Trends x Rates by Cohort x RRP Scorecard x RRP Top Opportunities x RRP Penalties x Comprehensive Financial History x **LACE Points Coded** x Intervention [+ < > ▼

Guide Your Analysis



Updated as of Date:
06/29/2016

Discharge Date Initial Encounter:

- All
- 2014
- 2015
- 2016

Financial Class:

Type to search in list

- (All) 8 values
- BLUE CROSS - B
- CHAMPUS - C
- COMMERCIAL INSURA...
- MEDICAID/TNCARE - R
- MEDICARE - M
- MEDICARE HMO - H

Area of Interest:

Type to search in list

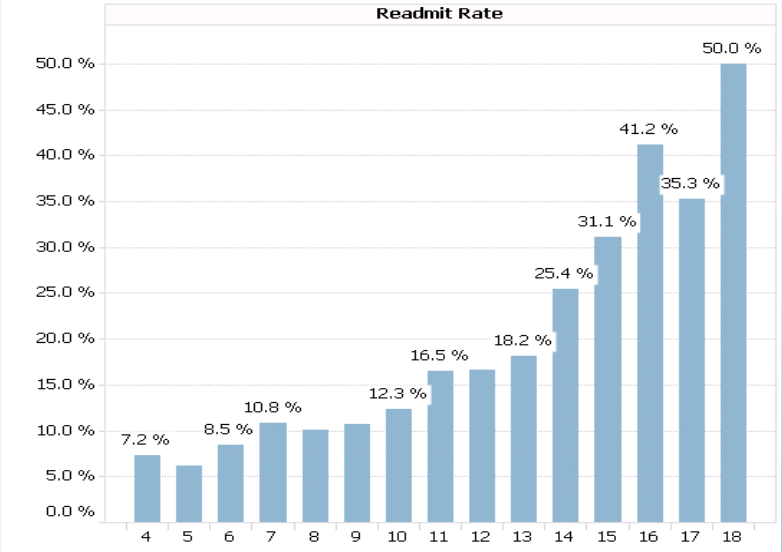
- (All) 35 values
- Adverse Effects
- Back and Spine
- Cardiac Invasive
- Cardiac Surgery
- Cardiovascular General

Readmission Type: **HWR All** Starting Range: 04/02/2014 End Range: 06/29/2016

Historic LACE Points vs Readmission Rate for HWR All

LACE Total Points	# of Readmit Encounters	Encounters w/One or More Readmission	Index Admissions	Readmit Rate
4	25	20	276	7.25 %
5	46	43	690	6.23 %
6	78	72	850	8.47 %
7	133	121	1,116	10.84 %
8	111	97	966	10.04 %
9	114	100	931	10.74 %
10	133	127	1,033	12.29 %
11	186	161	975	16.51 %
12	167	152	911	16.68 %
13	180	156	859	18.16 %
14	186	159	626	25.40 %
15	129	109	350	31.14 %
16	106	80	194	41.24 %
17	37	30	85	35.29 %
18	16	11	22	50.00 %
Grand t...	1,647	1,438	9,884	14.55 %

Historic LACE Points vs Readmission Rate for HWR All





Real Time Intervention Worklist

ends x Rates by Cohort x RRP Scorecard x RRP Top Opportunities x RRP Penalties x Comprehensive Financial History x LACE Points Coded x **Intervention Dashboard** x Definitions x

Guide Your Analysis

Current Patient Admit Dates
From 07/28/2016 to 09/09/2016

Comorbidity:

- All
- CC Cerebro
- CC Connective Tissue
- CC COPD
- CC Diabetes
- CC DM w End Organ
- CC Hem Onc
- CC HF
- CC Hx of MI
- CC Liver Disease
- CC Renal
- CC Severe Liver Disease
- N/A

Smoking Status:

- All

Number of Home Meds:

- All

On a High Risk Medication:

Display By: Admission Date **Color By:** LACE Total Points **Go Back:** 4 Days **Data Last Refreshed:** 09/09/2016 2:01 PM

Priority Patients for Intervention by Check in Date

Color by: Binned LACE Total Points

- 0 < x ≤ 5
- 5 < x ≤ 7
- 7 < x

Check in Date	0 < x ≤ 5	5 < x ≤ 7	7 < x	Total
09/05/2016	1	8	4	13
09/06/2016	4	5	6	15
09/07/2016	3	16	12	31
09/08/2016	2	24	11	37
09/09/2016	1	9	3	13

Intervention List

Patient Account Number	Check in Date	Chief Complaint	Admitting Diagnosis	Pt Type	Nursing Unit	LACE Total Points	ER Visits in Last 6 Months	Number of Home Meds	High Risk Med Count
00000000	09/06/2016	HEART FAILURE, UNSTAB	HEART FAILURE, UNSTAB	IP	000000	12	5	15	4
00000000	09/05/2016	HEART FAILURE, UNSTAB	HEART FAILURE, UNSTAB	IP	000000	11	2	16	4
00000000	09/08/2016	HEART FAILURE, UNSTAB	HEART FAILURE, UNSTAB	IP	000000	10	1	15	3
00000000	09/05/2016	HEART FAILURE, UNSTAB	HEART FAILURE, UNSTAB	IP	000000	10	3	16	2
00000000	09/06/2016	HEART FAILURE, UNSTAB	HEART FAILURE, UNSTAB	IP	000000	10	1	3	2
00000000	09/05/2016	HEART FAILURE, UNSTAB	HEART FAILURE, UNSTAB	IP	000000	10	2	16	4
00000000	09/07/2016	HEART FAILURE, UNSTAB	HEART FAILURE, UNSTAB	IP	000000	10	0		



Financial Performance



- Project penalties for Readmission Reduction Program
- Reduce readmission penalties
- Measuring intervention impact



Forecasted Readmission Adjustment Factor

Readmission Rates x Numerator Detail x Denominator Detail: Indexed Admissions x RRP Measure Trends x Rates by Cohort x **RRP Scorecard** x RRP Top Opportunities x RRP Penalties + < > v

Guide Your Analysis



Current Performance Period:

Start Date: 07/01/2014

End Date: 06/30/2017

Data Updated as of Date:
06/30/2016

Readmission \$\$'s at Risk:
\$1,673,700

Specify the ratio between the internal and the CMS rate for each measure:

Type	Adjustment Rate
AMI	1.53
CABG	1.25
COPD	1.20
HF	1.15
PN	1.01
THA TKA	1.02

Readmission Adjustment Factor:

Forecasted Readmission Adjustment Factor

Readmit Base Operating DRG	Payments for Excess Readmits	Aggregate Ratio	Factor Floor	Readmissions Adj Factor
00000000	000000	0.9860	0.9700	0.9860

Forecasted Measure Performance

Readmit Type	Readmit Rate	Rate Adjustment	Adj Readmit Rate	Historical Crude Nat Rate	Excess Readmit Ratio	Readmit Base Operating DRG	Payment for Excess Readmits
AMI	10.8 %	1.53	16.5 %	16.6 %	1.00	00000000	00
CABG	11.1 %	1.25	13.9 %	14.2 %	0.98	00000000	00
COPD	17.2 %	1.20	20.7 %	20.0 %	1.03	00000000	000000
HF	18.5 %	1.15	21.3 %	21.9 %	0.97	00000000	00
PN	17.5 %	1.01	17.7 %	17.2 %	1.03	00000000	000000
THA TKA	4.5 %	1.02	4.6 %	4.5 %	1.03	00000000	000000

Calculation Adjustment Set Up

Readmit Type	Historical Internal Rate	Historical CMS Rate	Historical Crude Nat Rate	Historical ERR	Ratio - Internal to CMS Rate
AMI	11.1 %	17.0 %	16.6 %	1.05	1.53
CABG	8.9 %	13.0 %	14.2 %	0.96	1.46
COPD	17.8 %	22.8 %	20.0 %	1.03	1.28
HF	19.3 %	22.6 %	21.9 %	0.98	1.17
PN	15.7 %	18.8 %	17.2 %	1.02	1.20
THA TKA	2.9 %	4.8 %	4.5 %	1.03	1.66

Forecasted RRP Penalty

Total DRG Amount	Penalty Rate	RRP Penalty
00000000	00000	0000000

Estimated Penalty Allocation per Miss

Readmit Type	Encounters with eadmissions	RRP Penalty	Penalty Per Readmission
AMI	66		
CABG	22		
COPD	114	000000	00.00
HF	119		
PN	140	000000	00.00
THA TKA	27	000000	00.00

Baseline Period

Start Date: 7/1/2012

End Date: 6/30/2015

The Ratio - Internal to CMS Rate represents the difference between the CMS reported readmission rate and the internally calculated readmission rate. The difference between the two values represents patients that were readmitted at a facility outside of the initial hospital system and the CMS risk adjustment.



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Offsetting Readmission Costs

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Data through: 12/31/2017

Date Filter*:

All

Intervention Success Rate:

15 %

Average Intervention Cost:

\$500

*Date Filter does not adjust the Penalty columns; so use caution with filtering date (Net Financial Impact is Calculated on the entire Penalty for the year).

Financial History

Readmit Type	2015						2016					
	Admits	Readmit Rate	Net Revenue	Profit	Penalty	Net Financial Impact	Admits	Readmit Rate	Net Revenue	Profit	Penalty	Net Financial Impact
AMI	298	10.0 %	\$4.6M	(\$191.7k)	(\$129.5k)	(\$321.19k)	291	11.1 %	\$4.7M	(\$208.9k)	(\$127.8k)	(\$213.29k)
CABG	96	10.0 %	\$3.1M	(\$655.9k)	\$0.0	(\$655.89k)	111	9.7 %	\$1.7M	(\$672.7k)	\$0.0	(\$672.74k)
COPD	401	17.2 %	\$3.5M	(\$132.2k)	(\$77.6k)	(\$209.80k)	106	15.5 %	\$2.6M	(\$193.4k)	(\$14.8k)	(\$208.27k)
HF	121	19.2 %	\$2.7M	\$195.5k	\$0.0	\$195.52k	106	17.9 %	\$2.7M	\$130.2k	\$0.0	\$130.19k
PN	721	10.0 %	\$5.1M	\$384.5k	(\$81.2k)	\$303.21k	721	15.2 %	\$4.2M	\$362.2k	(\$49.1k)	\$313.14k
THA TKA	282	1.5 %	\$3.5M	\$220.2k	(\$77.2k)	\$143.00k	182	6.9 %	\$4.1M	\$159.6k	(\$28.4k)	\$131.20k
Grand total	1,910	14.0 %	\$22.7M	(\$179.1)	(\$166.0)	(\$45.1)	1,908	12.2 %	\$22.7M	(\$475.7)	(\$114.6)	(\$390.2)

YTD Financial Performance

Readmit Type	2017					Readmits	Readmits to Prevent for No Penalty	Interven... Success Rate	Required Intervention	Interven... Cost	Estimated Net Savings
	Readmit Rate	Net Revenue	Profit	Penalty	Net Financial Impact						
AMI	9.0 %	\$5.1M	\$95.1k	\$0.0	\$95.1k	29	0	15 %	0	\$0	\$0.0
CABG	8.0 %	\$4.4M	(\$722.9k)	\$0.0	(\$722.9k)	12	0	15 %	0	\$0	\$0.0
COPD	16.1 %	\$2.1M	\$382.6k	\$0.0	\$382.6k	58	0	15 %	0	\$0	\$0.0
HF	19.8 %	\$1.7M	\$268.6k	(\$17.8k)	\$250.8k	77	8	15 %	53	\$26,667	-\$14.4k
PN	15.0 %	\$5.6M	(\$102.5k)	(\$101.7k)	(\$204.2k)	86	3	15 %	20	\$10,000	\$93.7k
THA TKA	1.9 %	\$1.6M	\$111.8k	\$0.0	\$111.8k	6	0	15 %	0	\$0	\$0.0
Grand total	12.9 %	\$25.8M	(\$250.6k)	(\$116.6k)	(\$166.6k)	268	11	15 %	73	\$36,667	\$79.3k



Community Impact



- Impact the welfare of the Community
- Build a healthier community
- Provide exceptional care to every patient every day



Physician and Practice Managers

Cardiology – Clinical Pharmacist Model

6 month study

- **178 patients seen**
 - 2 Readmissions
- **234 interventions made**
 - 53% med education
 - Rest – therapeutic consult, med changes, dosing adjustment, etc.

Pulmonology

New Clinic

- Process underway
- Success in progress!

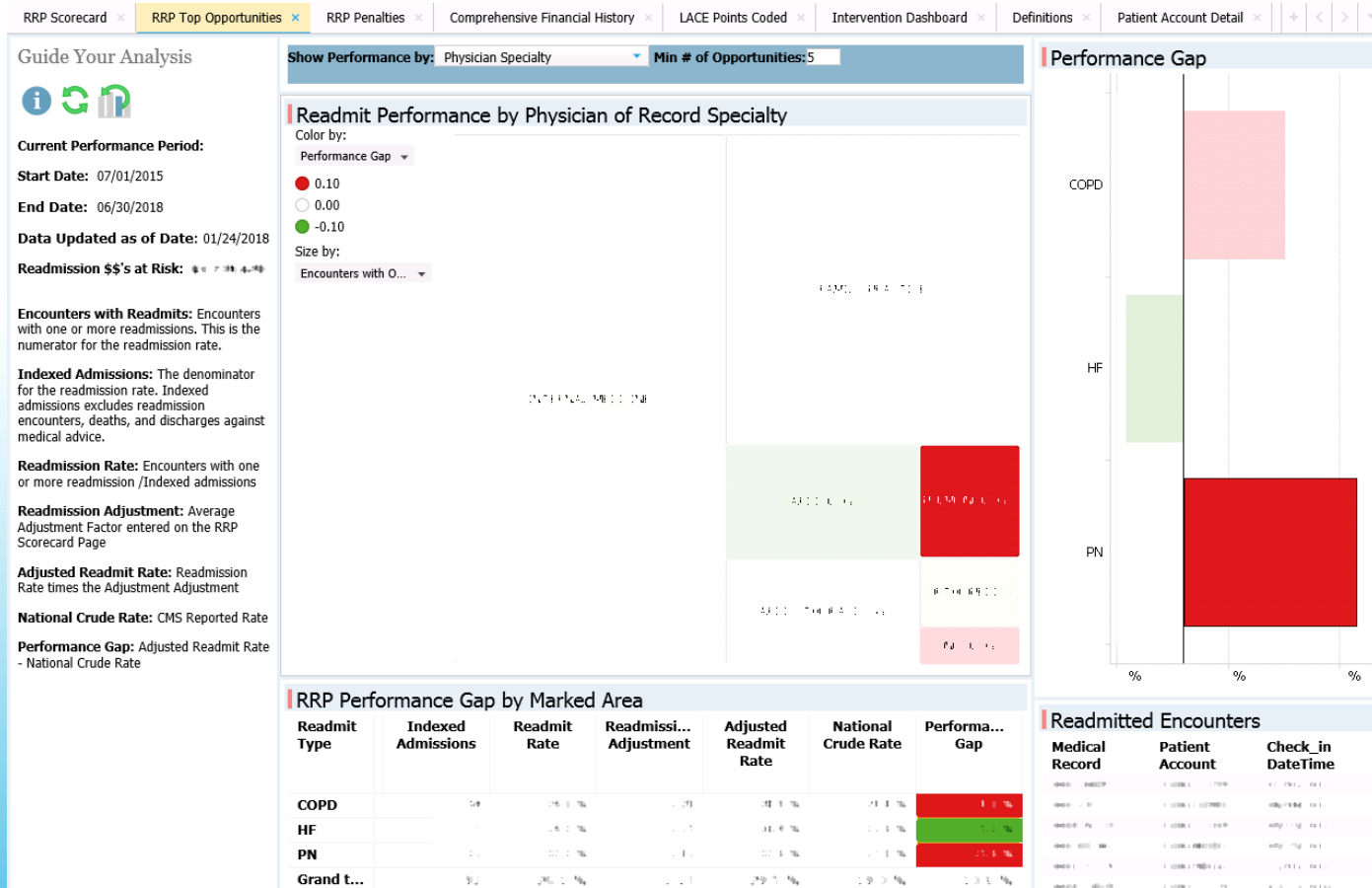


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Readmit by Physician of Record Specialty





The Results



Clinical effectiveness

Added 1.5 Transitional Care Coaches

Increased time with patients

Program expanding across organization

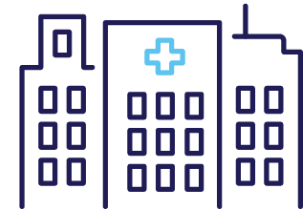


Financial performance

Real-time cost avoidance

Automated manual process (daily worklist)

ROI of additional Transitional Care Coach



Community impact

Focus from day one to prevent readmissions

Collaboration to address issues creating readmissions



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The Numbers



**Coronary Artery Bypass
Grafting (CABG)
– 44.9%**

**Chronic Obstructive
Pulmonary Disease (COPD)
- 23.1%**

**Pneumonia (PN)
- 6.6%**

**Total Hip or Knee
Arthroplasty (THA or TKA)
- 64.3%**

Data based on discharges to home, home health, SNF or hospice-home,
one year visualizations post-live, first year post visualizations live



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Readmission Trend for AMI

Guide Your Analysis



Updated as of Date:
09/30/2017

Discharge Date Initial Encounter:
 All

Financial Class:

- Type to search in list
- (All) 8 values
 - BLUE CROSS - B
 - CHAMPUS - C
 - COMMERCIAL INSURA...
 - MEDICAID/TNCARE - R
 - MEDICARE - M
 - MEDICARE HMO - H

Area of Interest:

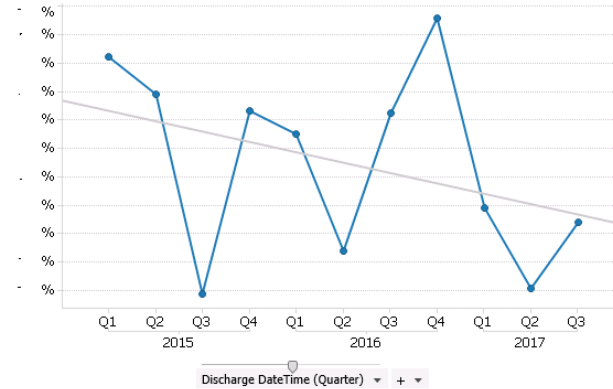
- snf
- (All) 17 values
- Disch/Tran to SNF w/ M...
 - SNF

DRG:

- Type to search in list
- (All) 371 values
 - 100-SEIZURES W MC...
 - 101-SEIZURES W/O ...
 - 103-HEADACHES W/...
 - 123-NEUROLOGICAL ...
 - 125-OTHER DISORDE...
 - 149-DYSEQUILIBRIU...

Readmission Type: AMI Starting Date Range: 01/01/2015 Ending Date Range: 09/30/2017

Readmission Trend for AMI



Summary Table for AMI

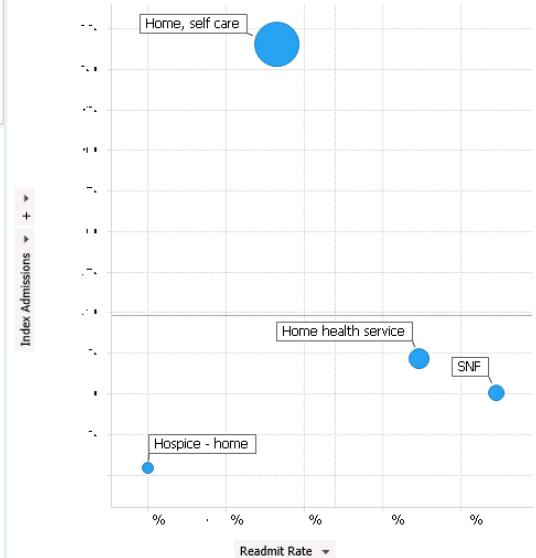
Year	Quar...	Month	Index Admissions	Encounters w/One or More Readmission	# of Readmit Encounters	Readmit Rate
2017	Q4	Oct	13	1	1	1 %
		Nov	13	1	1	1 %
		Dec	12	1	1	1 %
	Q1	Jan	25	1	1	1 %
		Feb	28	1	1	1 %
		Mar	11	1	1	1 %
	Q2	Apr	21	1	1	1 %
		May	21	1	1	1 %
		Jun	13	1	1	1 %
Q3	Jul	21	1	1	1 %	
	Aug	29	1	1	1 %	
	Sep	18	1	1	1 %	
Grand total			281	23	22	1 %

Impact Readmission Analysis for AMI

Readmit Rate Total Cost Total Pt Days Total Cost per Day

Area of Interest: Discharge Status Name Min Sample Size: 0

Readmission Rate by Area of Interest



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Best Practices

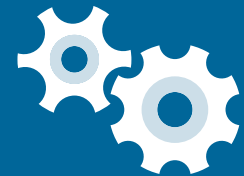
Integration of mission and vision

- Develop gap analysis
- Set realistic goals
- Define ownership of strategic directive
- Focus on human side of care
- Communicate regularly with nursing staff
- Determine pillars of care for readmissions

Senior Leadership Support

Generate excitement

*Weekly re-evaluation
with transitional care
interdisciplinary team*





Future Plans

*Expanding model of
Cardiology, Pulmonology
and Diabetes Clinic*

*Additional
Care
Coordinator*



Extend to all nursing units

- Unit Nurse and Case Manager can refer patients
- Referrals possible if not prioritized diagnosis

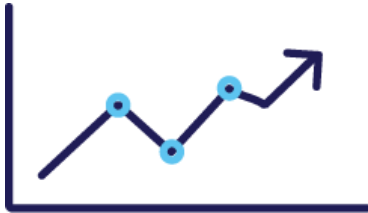


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Key Take-aways



Readmissions penalties will continue to increase



Unplanned readmissions impact quality and patient satisfaction



Predictive analysis can reduce readmissions and improve your margins



Questions