SNF Sepsis Rapid Response Team Community Para-medicine

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PARKVIEW HEALTH

Parkview Regional Medical Center

8 Hospitals
887 Beds

Annual Revenues:	**$ 1.6 billion**
Inpatient Encounters:	**1.9 million**
Outpatient Encounters:	**2.2 million**
Service Area Population:	**820,000**
Co-workers:	**11,000**
Medical Staff:	**> 600 PPG**

Parkview Noble

Parkview Hospital

Parkview Ortho Hospital

Parkview LaGrange

Parkview Whitley

Parkview Huntington

Parkview Behavioral Health

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Objectives

- Background of Sepsis Early Warning Sign pilot
- Need for Rapid Response grant
- Outcomes of SNF Rapid Response

Background to education pilot

- Hospital Sepsis team
  - Present on entry to hospital
  - SNF relationship
- Long term care collaborative, 31 facilities, Readmission analysis

Research Objectives

- Implement a hospital-developed acute standard of care in a LTC facility
- Focused on identification and treatment of sepsis in the LTC facility
- Understand impact of sepsis protocol in LTC facilities

Methods

- Conducted training and education in LTC facilities
- Instructed CNA's and nurses to watch for and identify sepsis in their patients
- The ordering NP of the physician will determine if the resident has sepsis based on diagnostic results and order the components of the three hours bundle
- The nurses recorded various data about each episode of treatment

Sepsis Identification in Long-Term Care

Hannah Johnson – Hillsdale College, Susan McAlister DNP, RN – Parkview Hospital

Background

- In 2011, sepsis cost about $20 billion to the healthcare industry in the U.S.[1]
- The incidence of sepsis in individuals older than 85 was about 26 cases/1000 people[2]
- About 2.3 million of the 331.5 million emergency department (ED) visits each year in the U.S. are due to sepsis[3]
- Nursing home residents were seven times more likely to have severe sepsis than non-nursing home residents when brought to the ED (14% versus 1.9%)[4]
- Implementing a sepsis protocol in the emergency department decreased costs from $21,985 to $16,103[5]

Objectives

- Determine if residents who reside in long-term care (LTC) facilities can be treated for sepsis in the facility utilizing the 3–hour sepsis bundle.
- We hypothesize that residents who are identified in the early progression of sepsis and are treated in the LTC facility will not have to be transported to an acute care facility
- Determine if treatment of sepsis in LTC facilities will:
  - Decrease overall healthcare costs
  - Decrease mortality
  - Decrease acute care hospitalization
  - Decrease Medicare spending

Materials & Methods

- **Study design**: This study design is a process/outcome study to determine how to implement an acute care standard in the LTC setting.
- This study is focused on understanding disease progression to identify sepsis in the early stages, applying the acute care 3-hour bundle in a timely manner, and the outcomes of early detection of sepsis.
- **Study population / Data Collection**: Data was collected by the clinical staff at 8 LTC facilities: Ashton Creek Health and Rehab Center, The Heritage of Fort Wayne, Lutheran Life Villages: Kendallville (LLVK), Heritage Park, Miller's Merry Manor, Saint Anne Home, Town House Health Center, and Woodview Healthcare Inc.

- **Time frame:** In November 2014, training was conducted at the 8 LTC facilities. In December 2014, the 8 LTC facilities began to identify potential sepsis patients and follow the 3-hour bundle protocols if appropriate.
- **Process:** The process that the clinical staff followed is shown in Figure 1.

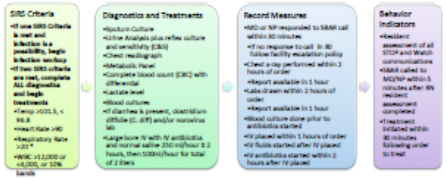


Figure 1: This flow chart shows the process that the clinical staff used to identify sepsis, begin treatment and diagnostics, and record data related to each episode of care.

- **Analysis:** Data was input into Microsoft Excel 2011 and statistical analysis was performed using Microsoft Excel 2011 and SPSS Statistics 22.
- The January 2014 - November 2014 time period will be referred to as the 2014 data, and the December 2014 - May 2015 data will be referred to as the 2015 data.

Results/Discussion

- **Resident Data:** Of the 91 residents, only one had a complete record with information for each variable. The remaining 90 residents had incomplete data, which ranged from three variables recorded to all but one variable recorded.
- The number of patients who had the NP/MD respond to the SBAR in less than 30 minutes totaled 72, there were 10 that did not, and 10 were blank.
- There were 42 patients who had blood cultured before antibiotics were started, 12 who did not, and 32 were blank.
- **Crimson Significance:** Crimson data (Table 1) reflects all 29 LTC facilities in Fort Wayne, IN not just the 8 pilot facilities thus any statistical significance found may have a much larger impact than initially perceived.
- If we can obtain any statistical significant differences from implementing training and education at only 8 of the LTC facilities, the data would suggest that even larger differences would be seen if there were training and education conducted at all 29 LTC facilities.

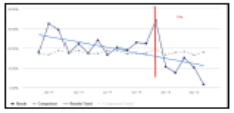
	Avg. # Patients	CMI	RA %	Avg. LOS	O/E	Mortality Percentage	% LTC volume
Sepsis							
2014 Mo. Avg.	56.64	2.32	13.99	7.31	0.63	4.06	22.81
2015 Mo. Avg.	67.83	2.01	9.02	7.02	0.28	2.43	21.94
p-value	0.0045	0.0195	0.0145	0.2765	0.0185	0.0825	0.4025
Severe Sepsis							
2014 Mo. Avg.	54.64	3.08	22.27	9.57	1.04	18.70	30.74
2015 Mo. Avg.	64.50	2.83	10.45	9.15	0.95	17.27	29.72
SPSS p-value	0.0380	0.0945	0.0060	0.2275	0.3220	0.3470	0.3795
Septic Shock							
2014 Mo. Avg.	37.64	3.53	22.59	11.14	1.29	29.11	29.19
2015 Mo. Avg.	39.67	3.26	10.55	10.42	1.09	26.32	32.14
SPSS p-value	0.3120	0.1035	0.0270	0.1870	0.1820	0.3065	0.2275

Table 1: This table shows the Crimson data averages for sepsis, severe sepsis, and septic shock classifications. The averages that differed significantly have p-values highlighted in yellow.

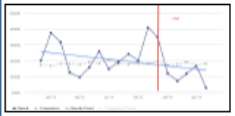
- **Re-admittance Percentage (RA %):** This was the factor that decreased significantly across all severities of sepsis.
- Most other factors also decreased, but these differences were not large enough to be significant.

Graph 3 - RA % - Sepsis

Graph 4 - RA % - Severe Sepsis



Graph 5 - RA % - Septic Shock



Graphs 3 – 5: These graphs show the RA % trend for sepsis, severe sepsis, and septic shock from January 2014 – May 2015. The trend lines all slope downward and there is a greater decrease seen after the redline, which denotes the start of the pilot study.

Graph 6 - Case Mix Index - Sepsis

Graph 7 - Observed/Expected- Sepsis

Graphs 6 and 7: These graphs show the case mix index (CMI) and observed/expected (O/E) mortality trends for sepsis patients. The CMI is a value of the severity of the illness, which is calculated during the coding process. The O/E value is the actual mortality rate observed divided by the expected mortality rate.

Labs: Lactic acid lab data (Table 2) was collected for all of the LTC facilities to see if the sepsis pilot changed the number of labs drawn.

	# Residents	# Lactic Acids (LA) drwan	# LA 2 or >	% residents with LA drawn
2014 Mo. Avg.	0.91	0.91	0.45	54.55
2015 Mo. Avg.	17	19.67	7	126.09
p-value	0.00	0.00		

Table 2: This table shows the lactic acid lab draws from 2014 and 2015. The number of residents and the number of lactic acid test drawn, were both significantly different (p-values highlighted in yellow) from 2014 to 2015. We see clearly that labs were not frequently drawn before the sepsis pilot was started.

Conclusions

- The time elements in the resident data demonstrates that the components of the 3-hour bundle were not completed in the 3-hour time frame. With the significant results this leads to an additional questions if the 3 hour bundle time frame is applicable in Long Term Care.
- The statistically significant data as revealed in the utilization of the Lactic Acid tests and the reduced RA % indicates that applying components of the 3–hour bundle had positive outcomes in sepsis.
- Early detection appears to contribute to decreased hospital readmissions. The RA % decreased significantly for all severities of sepsis. The reduction in RA % is a positive factor related to treating patients in their place of residence and decreasing healthcare costs.
- The other variables measured, mortality and CMI, decreased during the pilot. The downward trend of variables suggests great significance to the Fort Wayne healthcare community, so the sepsis pilot has been disseminated to all 29 Fort Wayne LTC facilities.
- The large increase in Lactic Acid testing revealed that the sepsis pilot increased sepsis awareness and early detection. There was evidence that multiple Lactic Acid tests we drawn on the same patient indicating close monitored for worsening symptoms, which also may have resulted in a decrease in sepsis severity.

Works Cited

1. www.hcup-us.ahrq.gov/reports/statbriefs/sb160.jsp. Accessed July 13, 2015.
2. Angus D, Linde-Zwirble W, Lidicker J, et al. Epidemiology of Severe Sepsis in the United States: Analysis of Incidence, Outcome, and Associated Costs of Care. Crit Care Med 2001;29:1303–10.
3. Wang H, Shapiro N, Angus D, Yealy D. National Estimates of Severe Sepsis in United States Emergency Departments. Crit Care Med 2007;35:1928-1936.
4. Ginde A, Moss M, Shapiro N, Schwartz R. Impact of Older Age and Nursing Home Residence on Clinical Outcomes of U.S. Emergency Department Visits for Severe Sepsis. J Crit Care 2013;28:606-6011 .
5. Shorr A, Micek S, Jackson W, Kollef M. Economic Implications of an Evidence-Based Sepsis Protocol: Can We Improve Outcomes and Lower Costs? Crit Care Med 2007;35:1257-1262 .

Acknowledgements

Student Research Fellowship Program
Parkview Health

Lessons learned and next steps

- Delay in assessment time
- Delay in lab draws
- Delay in lab results turn around time
- Delay in IV starts and fluids

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Grant funding

- October 1, 2015 – September 30, 2017
- $327,706

$327,706
Community Paramedicine Project – Parkview Health Systems, Inc.
October 1, 2015 – September 30, 2016
Indiana State Department of Health Division of Chronic Disease, Primary Care, and Rural Health

Federal Funds	Item	Description	Amount
Personnel			
	Unit A- 24-7 Allen County, 4.2 FTEs @$20.00/ hr=41,600	Training/services @ 120 hours	$ 174,720
Fringe	33% of unit A/ FTEs		$ 57,658
Federal Total			**$ 232,378**
State Funds			
Personnel	Unit B1 FTE -8-hour/5 days/wk	Training/services	$ 55,328
Equipment	1 vehicle		$ 40,000
State Total			**$ 95,328**
Federal/StateTotal			**$ 327,706**

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Intent

Parkview Community Paramedicine program: Sepsis Reduction

Community Paramedicine (CP) is a community-based care model where paramedics work outside their normal emergency response roles to provide preventive and follow-up care to people in their homes or skilled care facilities. CP paramedics proactively focus on assisting people with regaining optimal well-being outside the hospital setting.

To further enhance our community paramedicine program, Parkview Regional Medical Center has partnered with several local skilled nursing facilities. This partnership will focus on assisting skilled facility providers in the recognition, treatment and prevention of sepsis.

Team


Ashton Creek
HEALTH & REHABILITATION


KINGSTON
HEALTHCARE COMPANY


AmericanSenior
Communities


Saint Anne
COMMUNITIES
Faith centered Family focused


Miller's
Merry Manor


LUTHERAN
LIFE VILLAGES


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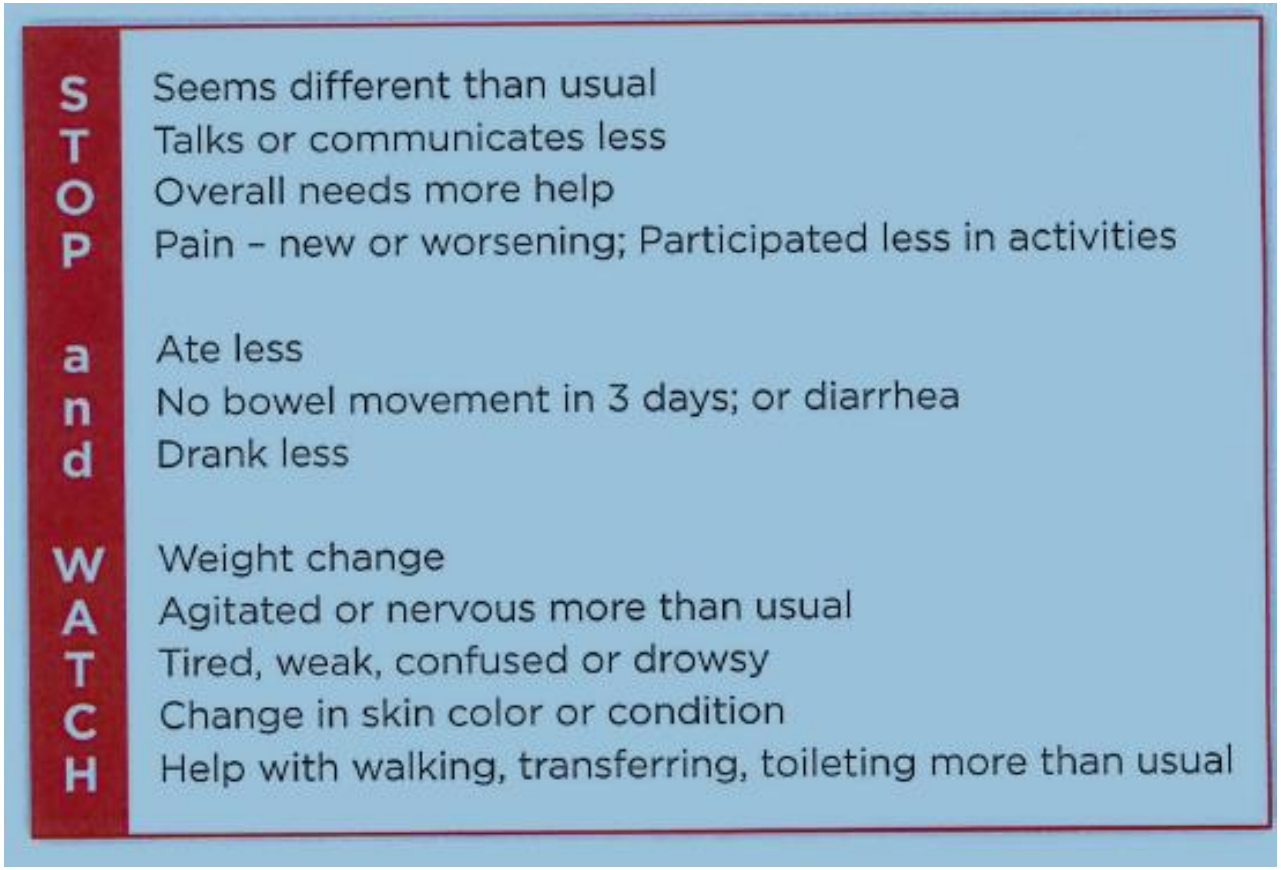
Stop and Watch



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This is a clinical protocol and the clinical condition of a pre-septic patient may trigger early activation of the process to ensure best outcome.

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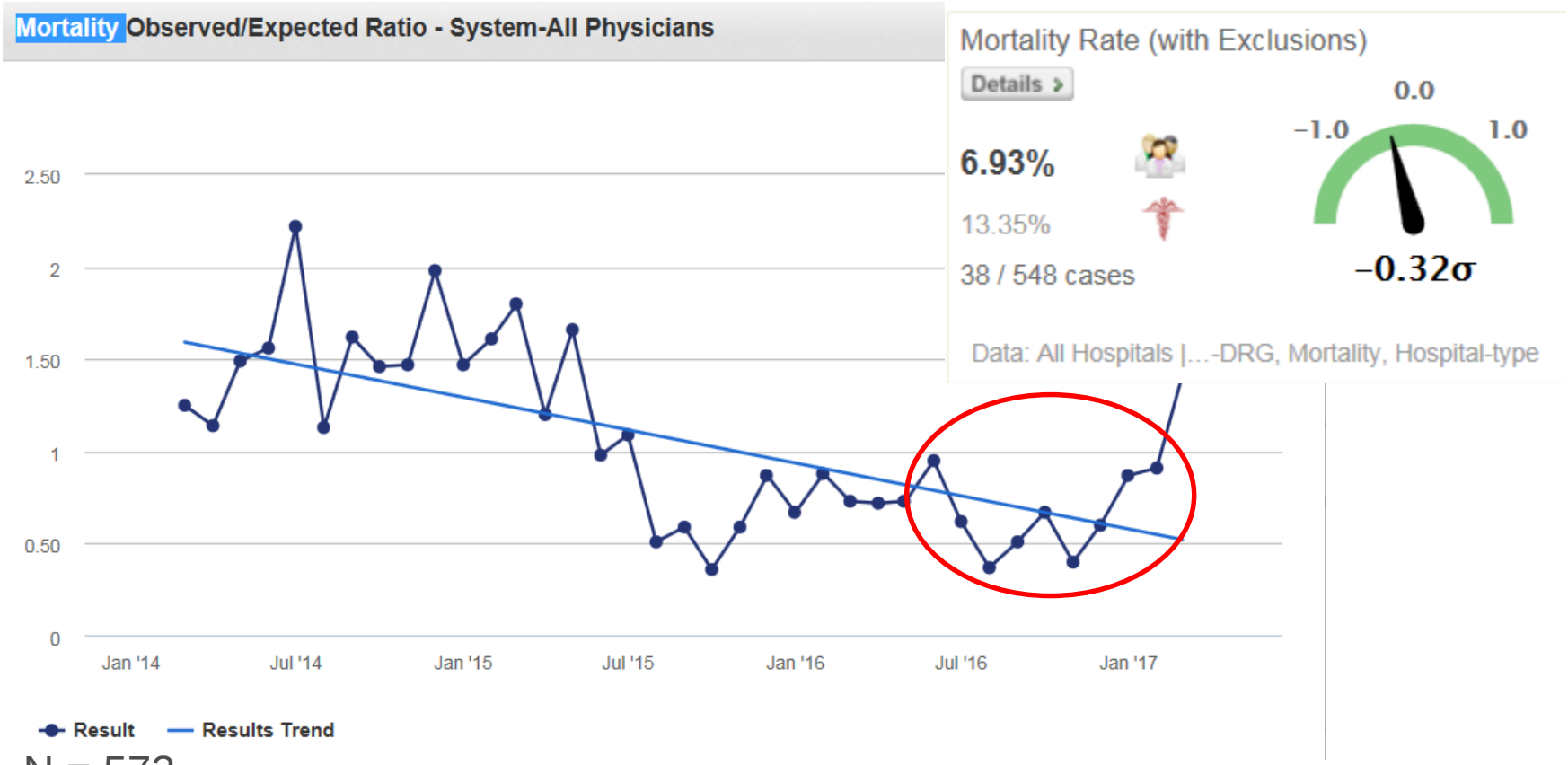
Crimson Data Selection

- May 2016 – March 2017
- 65 older
- Inpatient and Hospice
- Top Decile comparison
- Parkview Regional Medical Center
- Sepsis DRGS 870, 871, 872

Mortality Rate (Observed/Expected)



N = 572

Palliative Care = 141 25%

Prior to rapid response 12 months = 711 cases (85% shift)

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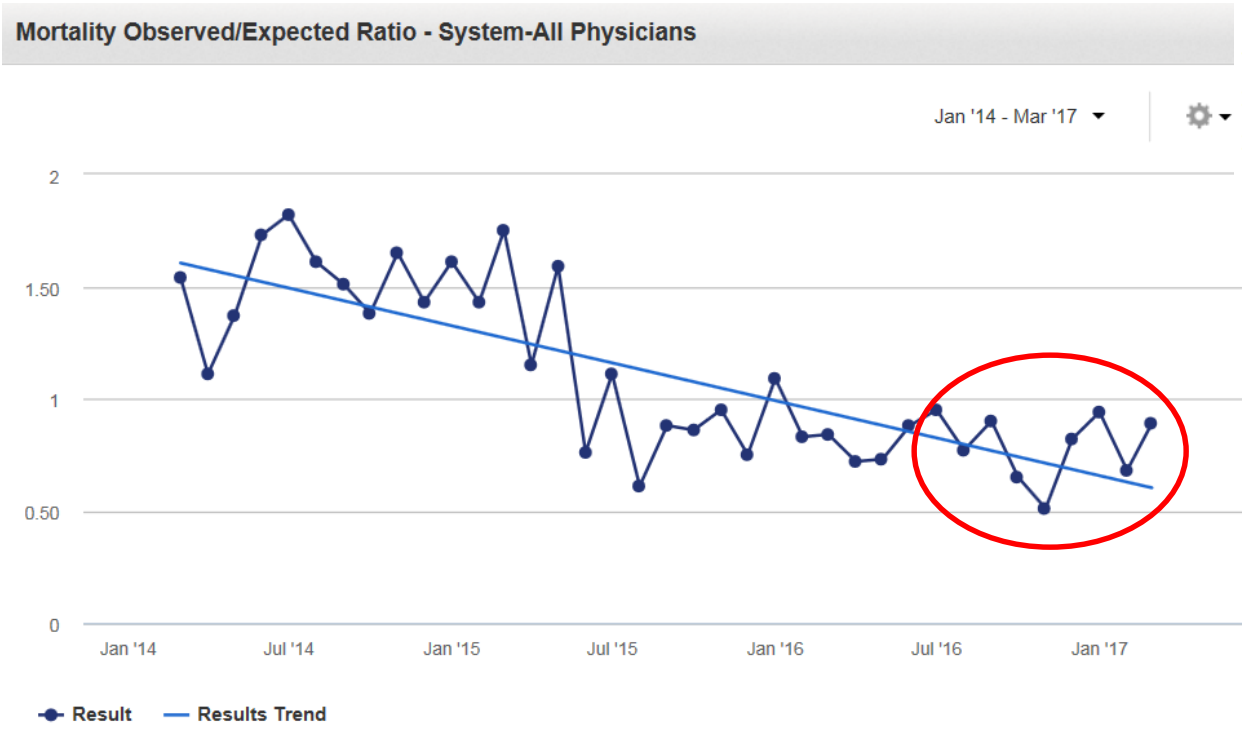
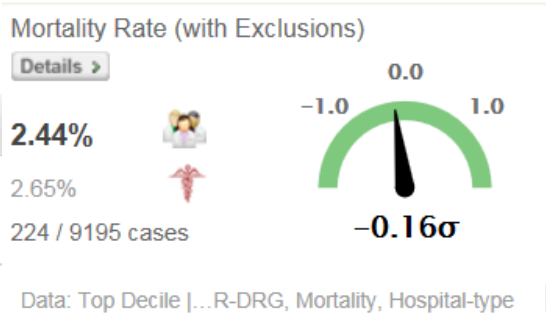
PRMC All DRG Mortality





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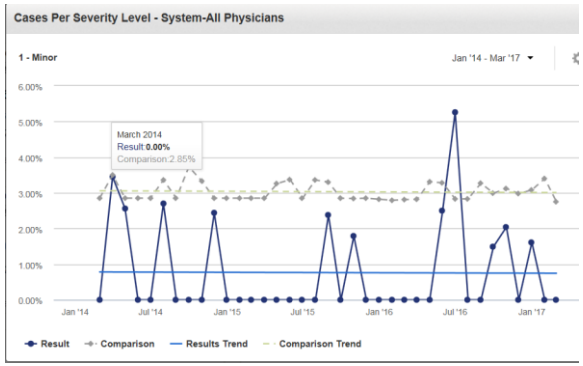
Cases Per Severity Level

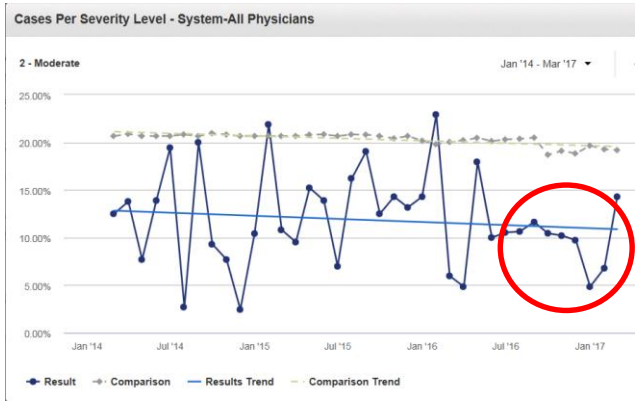
Details ›

SEVERITY LEVEL	RESULT	AVERAGE	CASES
1 - Minor	1.05%	3.07%	6
2 - Moderate	10.31%	19.56%	59
3 - Major	47.90%	45.54%	274
4 - Extreme	40.73%	31.84%	233

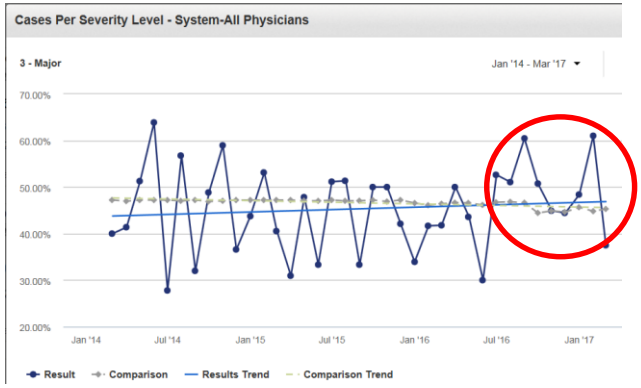


Low level of **Minor admissions** – Care at SNF

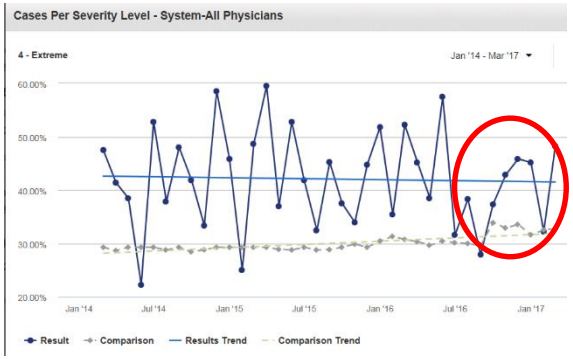
Decreased level of **Moderate Admissions** – Care of SNF



Increase level of **Major Admissions** – Transport Sickest



Decreased level of **Severe Admissions** – Care of SNF with hospice



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Case Study #1

- 72-F
- 3 Weeks post op, increased Abd. Pain.
- SIRS –
- Presentation, Sats 67% on 3 l/m, increased to 6 l/m with saturations increasing to 88%.
- Assessment found CP, skin was cool, grey.
- 911 called and sent to ED for Eval and Tx

Case Study #2

- 94-F
- Called for ALOC, dyspnea, recent recurrent Pneumonia
- Assessment and protocol initiated.
- Lactate 1.49
- Fluids and Abx started. Family present and talked about process for Sepsis program

4 hour follow up

- Lactate 1.58
- Decreasing LOC and respiratory distress increasing
- Discussing Bi-Pap
- Family remains at bedside
- Hospice consult

8 hour follow up

- No interventions
- Hospice with family
- Conversation with family and Community Paramedic

SNF Return on Investment patient data

- Runs = 366
- Hospital Admits = 52
- 30 day Readmission 14%

- Assumption 25% of non admitted patients would have had an admission
  - 78 patients
  - 30 day readmit for Sepsis =$13,692 (CMS 2012) X 78 $1,067,976
  - Ambulance transport $1,800 X 78 $140,400

- 25% would have had an ED visit
  - 78 patients
  - ED @ $1,050 (average between Level 1 and level 4) X78 $81,900
  - Ambulance transport $1,800 X78 $140,400

$1,430,676

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Return on Investment

• Patient Costs	$1,430,676
• Staffing (4.3 FTE's)	232,373
• Vehicle	40,000
	$1,158,303

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Outcomes

- Early detection and treatment
- Resident Quality of Life
  - Decrease transitions in care
    - Safe handoffs
  - Advanced care planning decisions

Secondary Gains

- CMS Value Based Purchasing mortality
- CMS readmission reduction program
- Value based outcomes
  - Admits/1,000
  - ED utilization/1,000
- Total Medicare spend

What happens when the grant is concluded?

- Parkview Health has funding for the remainder of 2017 and 2018
- Developing a business plan for continued funding beyond 2018

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Questions