Population Health Programs to Decrease Mortality, Length of Stay, Readmissions and Costs from Hospital to Home

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WellSpan VNA Home Care

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Objective:

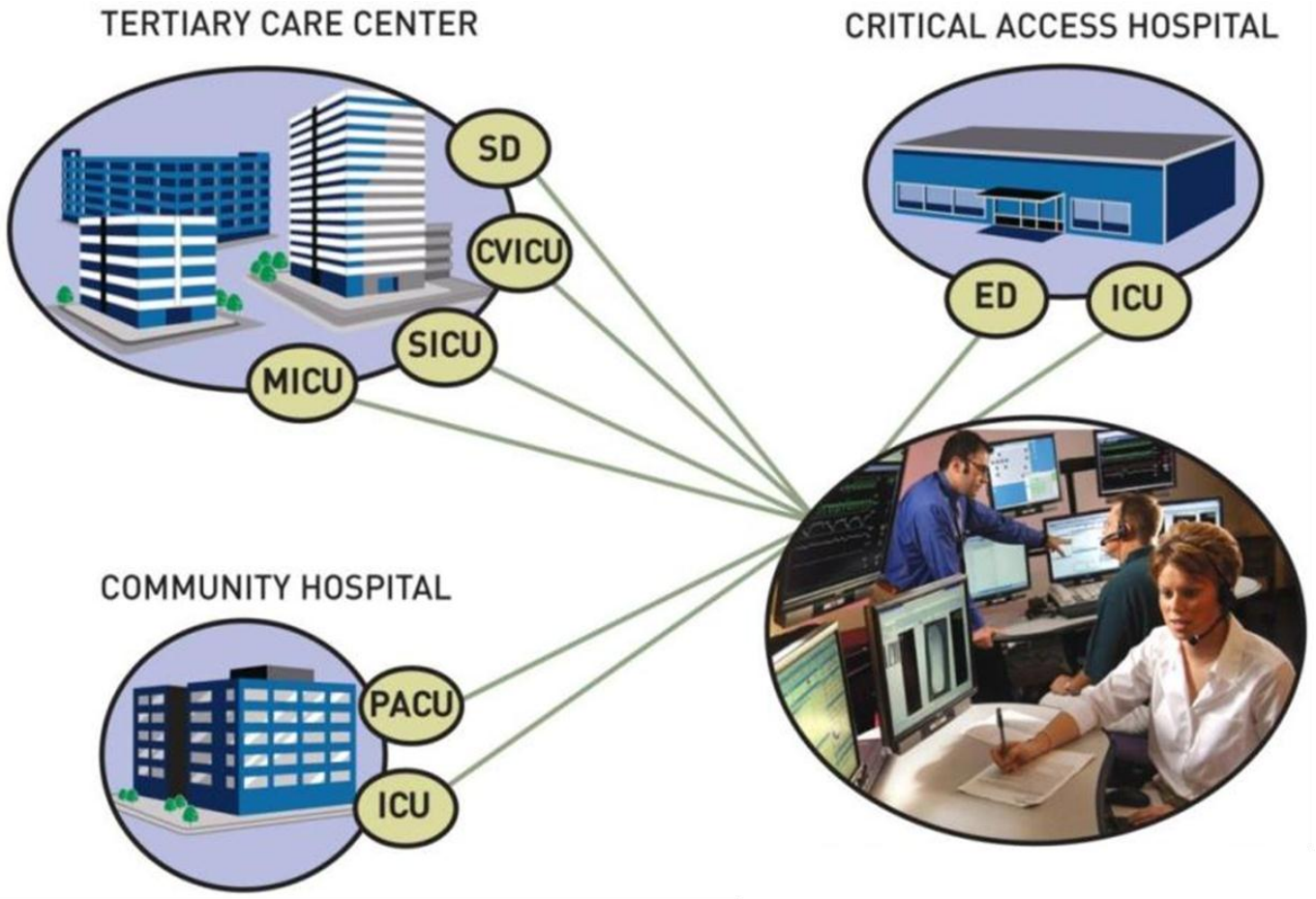
Improve Quality + Reduce Costs

Role of Telemedicine

- Extending reach of clinicians
- Various telemedicine models
  - Typically a ***consultative*** model
    - Minimal change in type of care delivered
- Consultative models are easy to implement but tend to yield incremental benefits

Images downloaded from:
http://blogs.cisco.com/healthcare/a-key-to-unlocking-the-value-of-telemedicine/

What is the *e*ICU Program Model?



How is the *e*ICU model a disruptive innovation?

In addition to consultative care by experts…

- Entirely new care model developed
  - Continuous 24/7 care
  - Proactive monitoring
  - Remote population management
  - New roles and responsibilities ***distinct*** from activities at the bedside
    - CCRN-E - Adult Tele-ICU Acute/Critical Care Nursing Certification

Enabling Technology

- Technological improvements lead to:
  - Increased quality and reliability of care delivered more efficiently
  - Program has evolved from supporting ~50 ICU beds to >500 ICU beds from single center

Population Management Technology

Clinical Outcomes

From: **Hospital Mortality, Length of Stay, and Preventable Complications Among Critically Ill Patients Before and After Tele-ICU Reengineering of Critical Care Processes**

JAMA. 2011;305(21):2175-2183. doi:10.1001/jama.2011.697

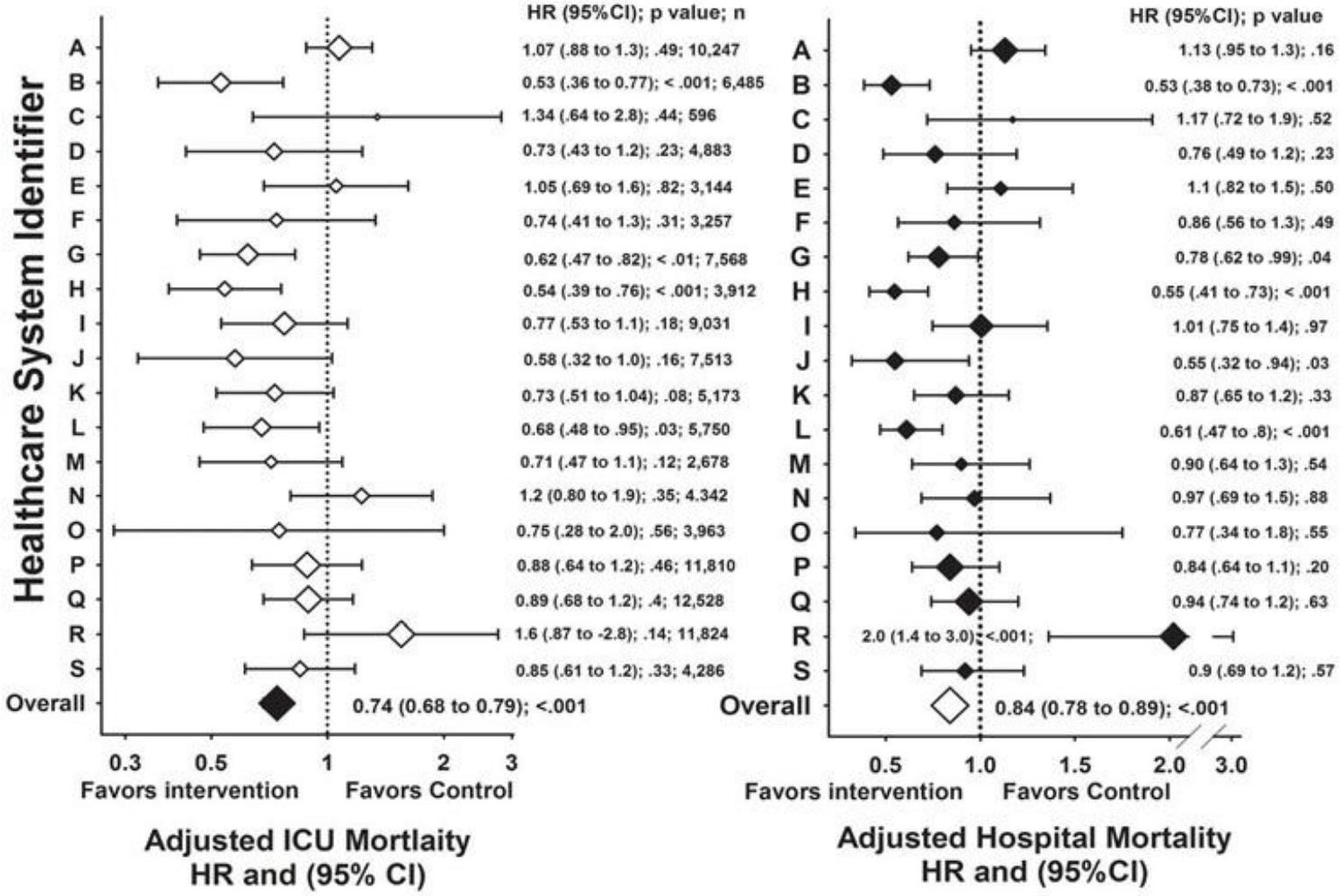
Table 3. Mortality and Length-of-Stay Outcomes

Outcome	Preintervention Group (n = 1529)	Tele-ICU Group (n = 4761)	Unadjusted *P* Value	Tele-ICU Effect Estimates[a]	*P* Value
	No. (%) of Patients				
Mortality rate					
Hospital	208 (13.6)	562 (11.8)	.07	0.40 (0.31-0.52)[b]	.005
ICU	164 (10.7)	410 (8.6)	.01	0.37 (0.28-0.49)[b]	.003
	Mean (SD) and Median [IQR], d				
Length of stay					
Hospital	13.3 (17.1) 7.9 [0.2-15.0]	9.8 (10) 6.8 [0.2-12.0]	<.001	1.44 (1.33-1.56)[c]	<.001
ICU	6.4 (11) 2.5 [0.2-6.5]	4.5 (6.7) 2.4 [0.1-4.6]	<.001	1.26 (1.17-1.36)[c]	<.001

Abbreviations: ICU, intensive care unit; IQR, interquartile range.
[a] Estimate of effect size after adjustment for differences in acuity score, admission source, admission ICU, time after enrollment of first case in group, and other predictive factors including laboratory values and physiological measurements as detailed in the eSupplement at http://www.jama.com.
[b] Indicates odds ratio (95% confidence interval).
[c] Indicates hazard ratio (95% confidence interval).

Recent study with 118,990 adult patients from 56 ICUs in 32 hospitals

Lilly, Craig M., et al. "A Multi-center Study of ICU Telemedicine Reengineering of Adult Critical Care." *CHEST Journal* (2013).

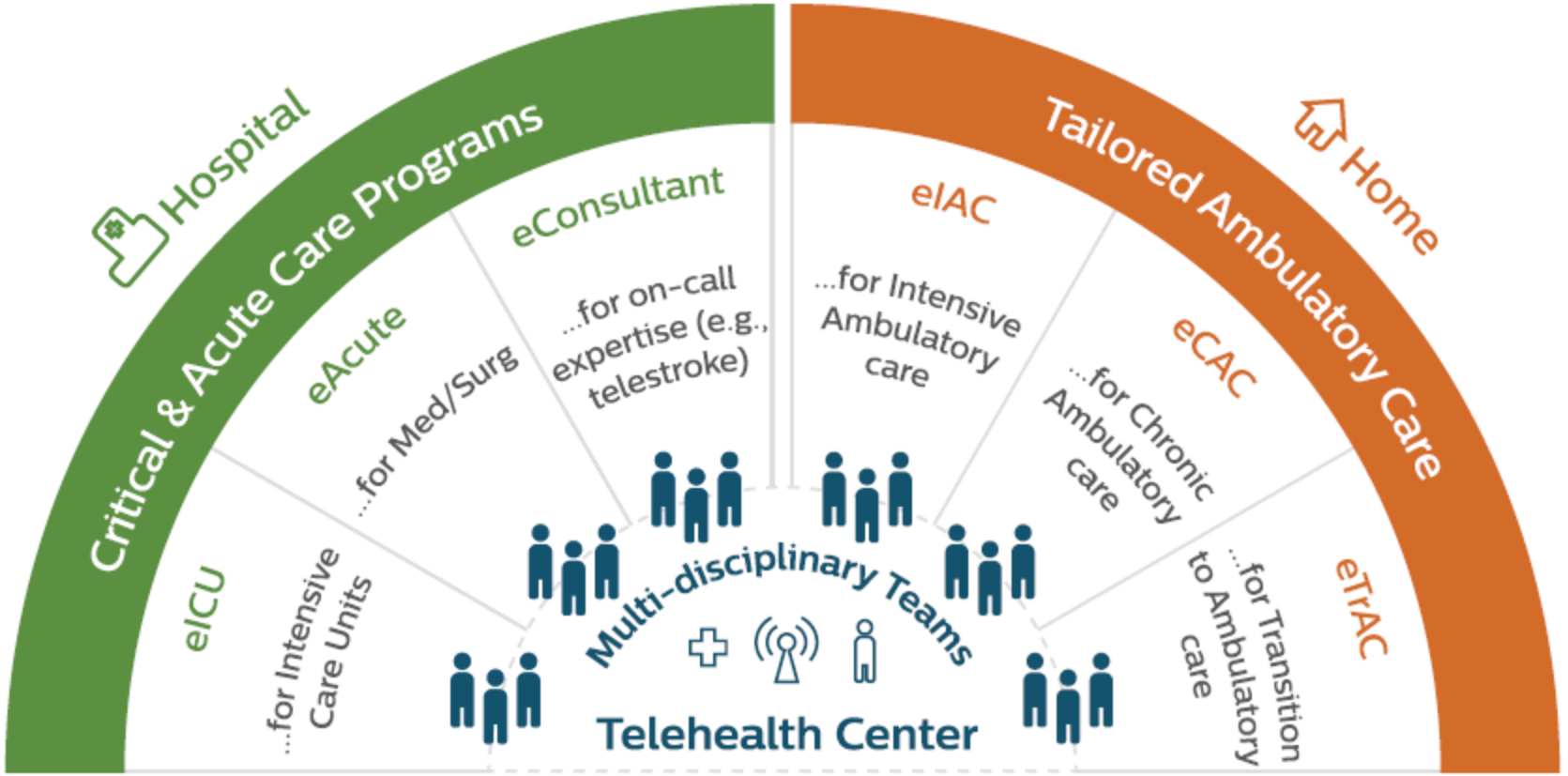


Factors Associated With Success

- Effective Collaboration
  - In 2 studies not showing benefit, the attending physician did not allow the *e*ICU to be involved in ANY patient care (outside of codes) in ~2/3 of 'intervention' patients.[1,2]
- *e*ICU Physician case review within 1 hr of admission[3]
- Quick *e*ICU response time to alerts[3]
- Frequent review of performance data with hospital leadership[3]
- Adherence to ICU best practices[3]
- More effective ICU Committee leadership[3]
- More frequent interdisciplinary rounds[3]

1. Thomas, Eric J., et al. "Association of telemedicine for remote monitoring of intensive care patients with mortality, complications, and length of stay." *JAMA*302.24 (2009): 2671-2678.
2. Morrison, Jeanette L., et al. "Clinical and economic outcomes of the electronic intensive care unit: Results from two community hospitals*." *Critical care medicine* 38.1 (2010): 2-8.
3. Lilly, Craig M., et al. "A Multi-center Study of ICU Telemedicine Reengineering of Adult Critical Care." *CHEST Journal* (2013).

Enterprise Telehealth from Hospital to Home



Accountable Care Organization / IDN

ICUs | ED | Med/Surg | SNF | LTA | Clinics | Specialists | Home

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Promising results in the Med/Surg setting

Banner Health Pilot

Application of the eICU care model to the medical/surgical patient population can positively impact patient outcomes, throughput, and costs.

Compared to standard care, a telehealth-based care delivery model in the medical/surgical unit:

- Reduced the length of stay by 17%
- Reduced the cost of care per case by 16%
- Reduced death or hospice care by 26%
- Reduced falls by 36%

**110 beds in the pilot*

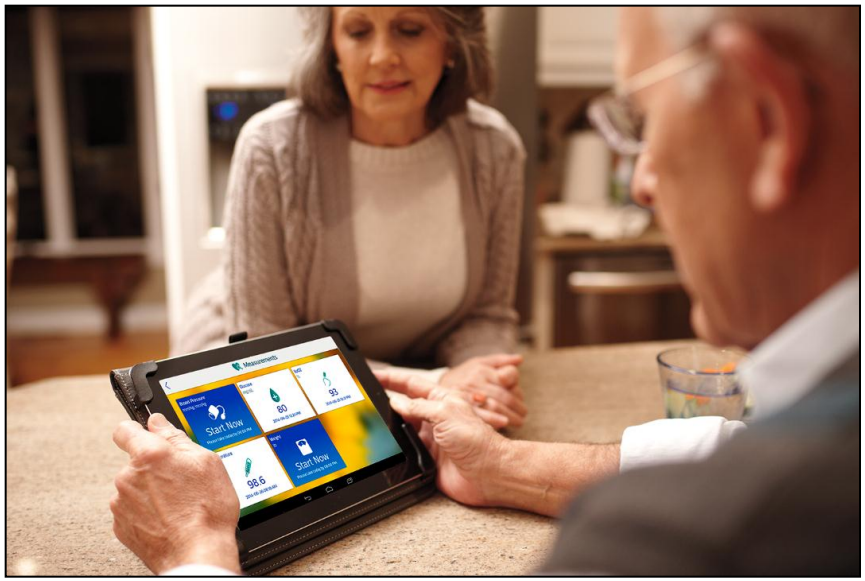
Jenkins CL, et al. Positive Deviance: Introducing eICU Technology to the Medical Surgical Patient Population. Banner Health. Nov. 2010.

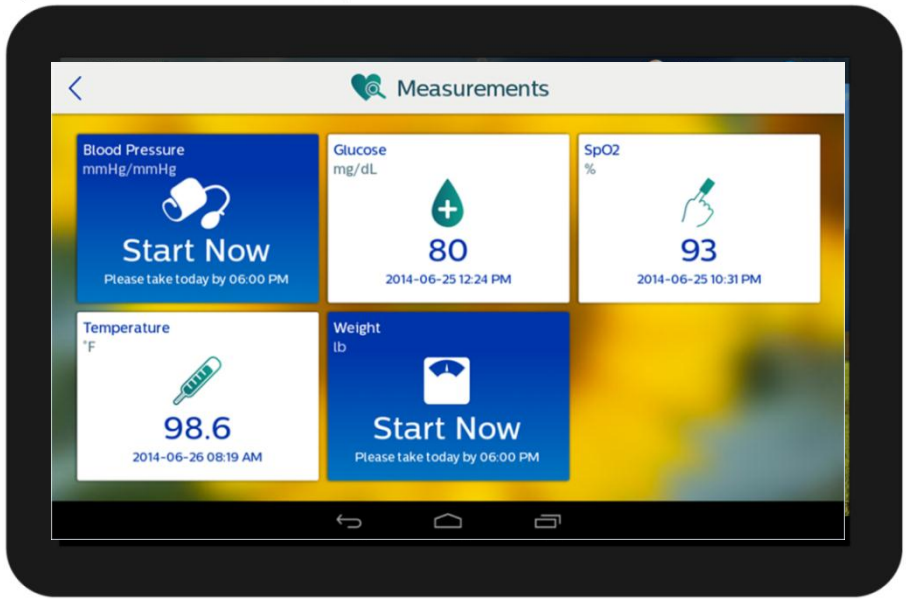
Intensive Ambulatory Care (eIAC)

- Supporting ambulatory patients with multiple comorbidities in the highest cost group
  - New care model
  - New roles and responsibilities
  - New enabling technologies
    - In-home devices monitor physiologic status and compliance, deliver surveys / education and enable real time 2-way audio/video communication
    - Quality, operational and outcome reports provide data to guide quality improvement and evaluate program efficacy

Ambulatory - New Platform for Patient Engagement and Monitoring

- Wireless Bluetooth Devices
- Glucometer cable
- Embedded cellular or Wi-Fi
- 2-way video
- Icon-based user interface
- Audio/Visual prompts
- Text to speech capabilities
- Supports manual entry

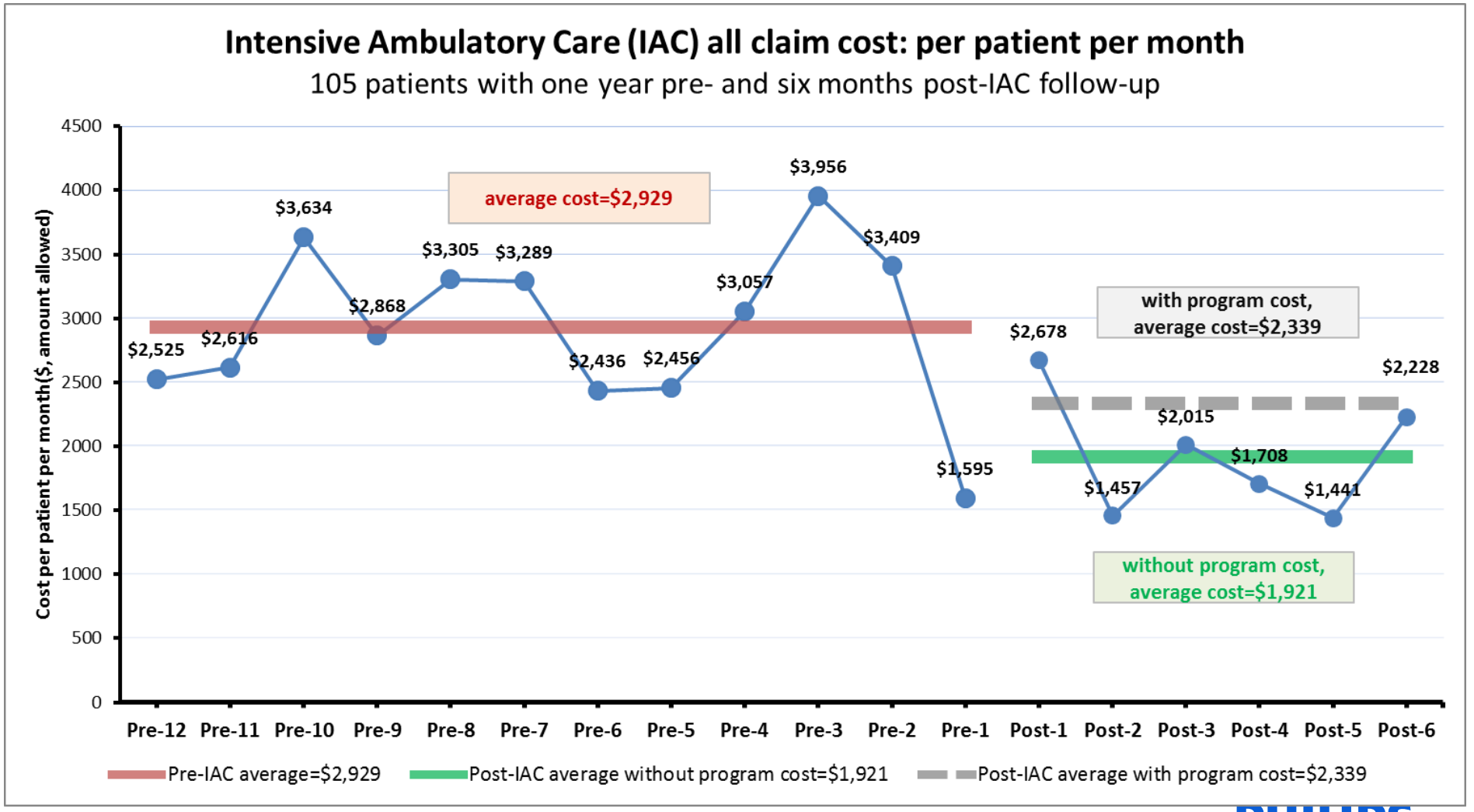




Overall cost reduction with program cost

105 patients

Statistically significant reduction in average monthly cost after IAC enrollment, even with program cost ($418 per patient per month) added to post-IAC cost



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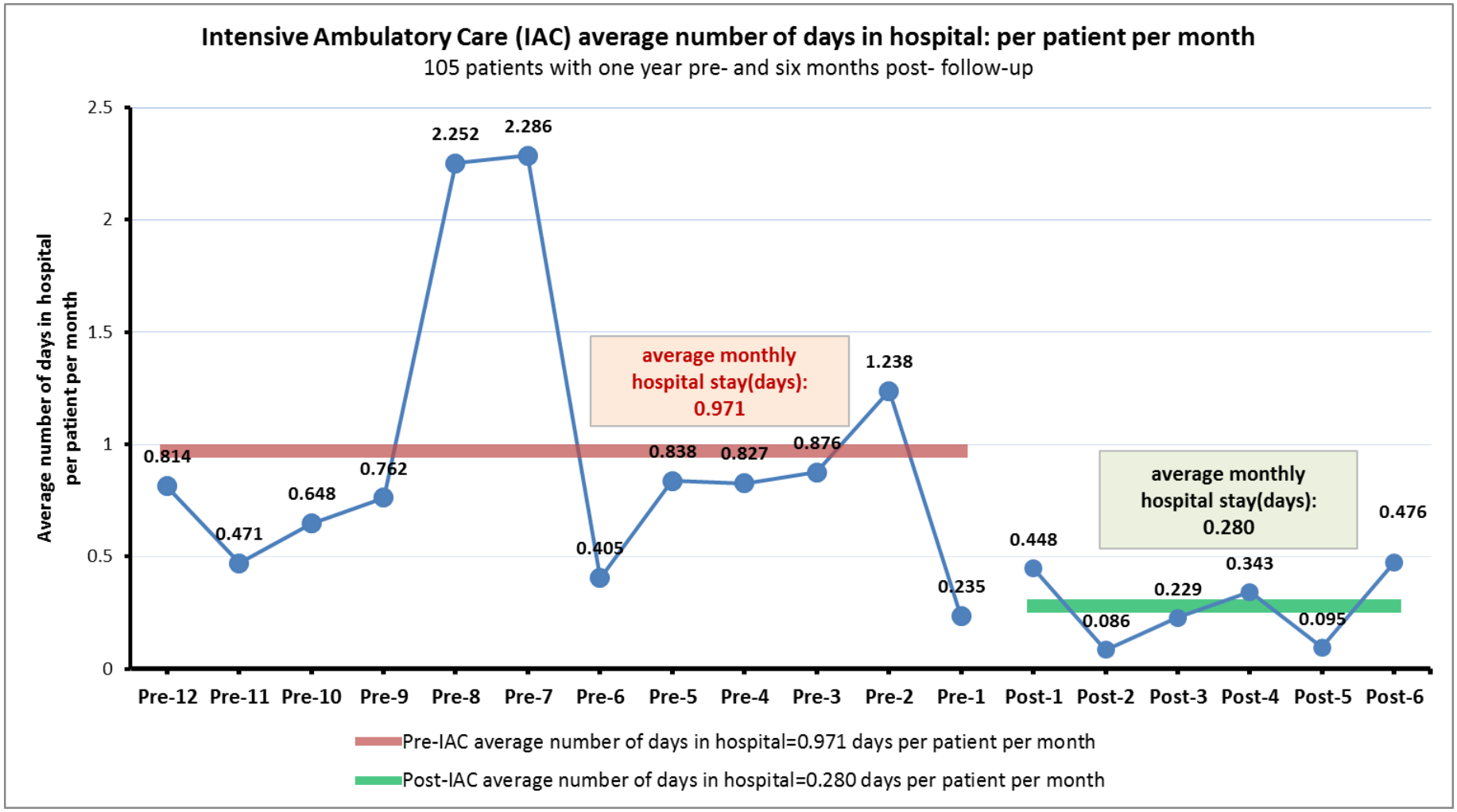
Average number of days in hospital per patient per month

105 patients

Significant reduction in days in hospital per patient per month, one year pre- and six months post-IAC: 97.1 days per 100 patients per month vs. 28 days per 100 patients per month, p<0.01



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Conclusions

- Technology extends the reach of clinicians but is not sufficient
- Consultative telemedicine models are relatively easy to implement and yield incremental benefits
- Remote population management programs can be leveraged to efficiently delivery QI initiatives
- Integrated telehealth programs can increase efficiency by leveraging existing infrastructure
- Effective remote population management can produce substantial improvements but requires:
  - Cultural change
  - Development of new clinical roles
  - Transformation in the care model
  - Program management with continuous evaluation feeding quality improvement

The Importance of Home Care in Population Health Management

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WellSpan VNA Home Care

About WellSpan Health

Hospitals (878 Beds)

- York Hospital
- Gettysburg Hospital
- Ephrata Community Hospital
- Wellspan Surgery & Rehab Hospital

Patient Care (93 Locations)

- Primary Care & Rehab Services
- Diagnostic Imaging & Laboratory
- Retail Pharmacy & Walk-In Care

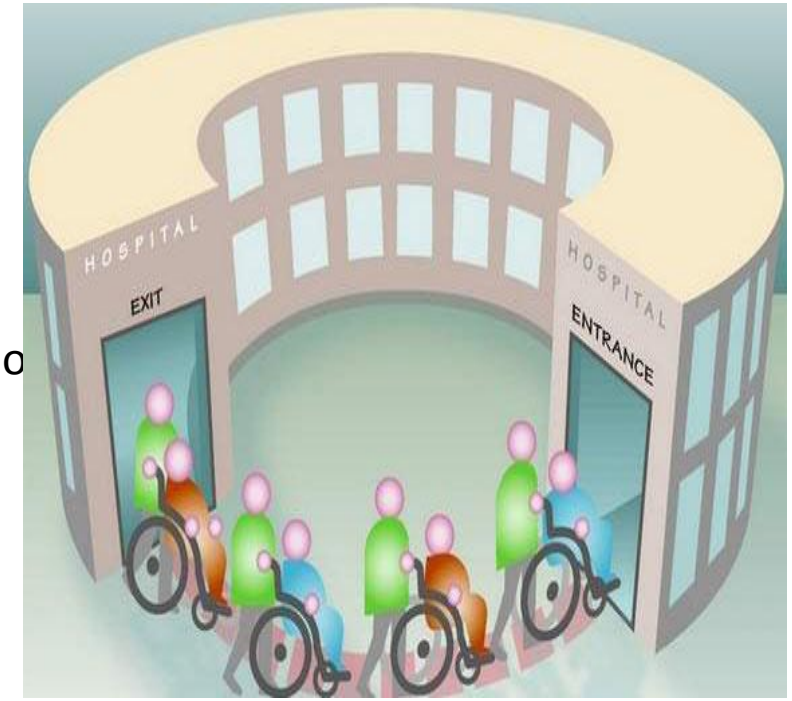
Home Care (5 Counties)

- 1600 + “Touched Lives” Daily
- Traditional Care Services
- Specialty Wound, IV Therapy, Palliative, & Therapy Services

WellSpan TeleHealth: Who?

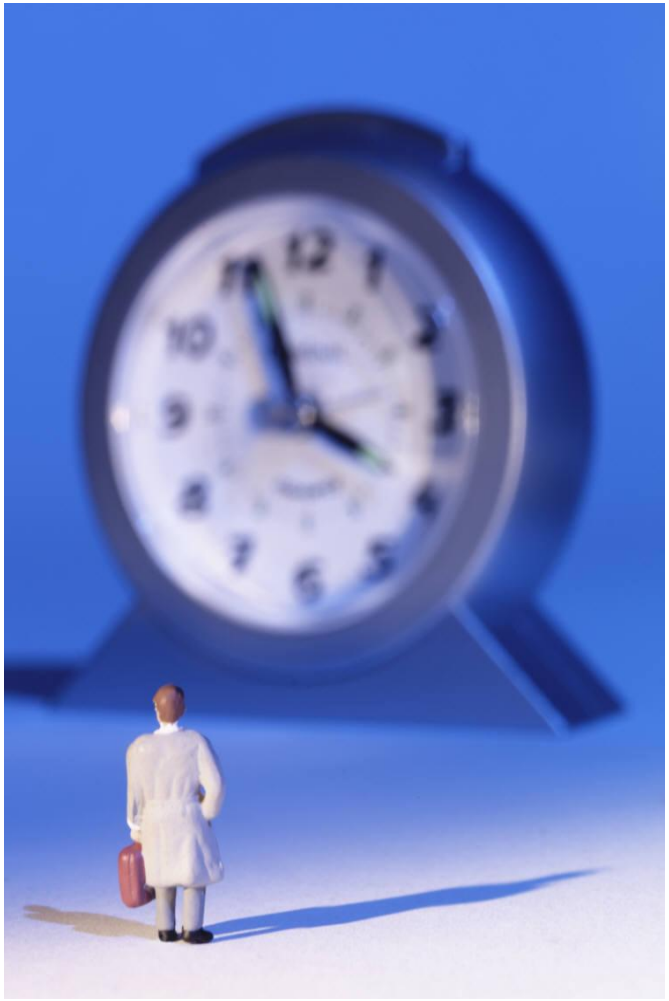
- CMS Imposing penalty for 30 Day Re-Hospitalization (Current)
  - AMI (Acute Myocardial Infarction)
  - Heart Failure
  - Pneumonia

- Future Penalties for 30 Day Re-Hospitalizatio
  - Joint Replacement*
  - COPD (Chronic Obstructive Pulmonary Disease)*



WellSpan TeleHealth: When?

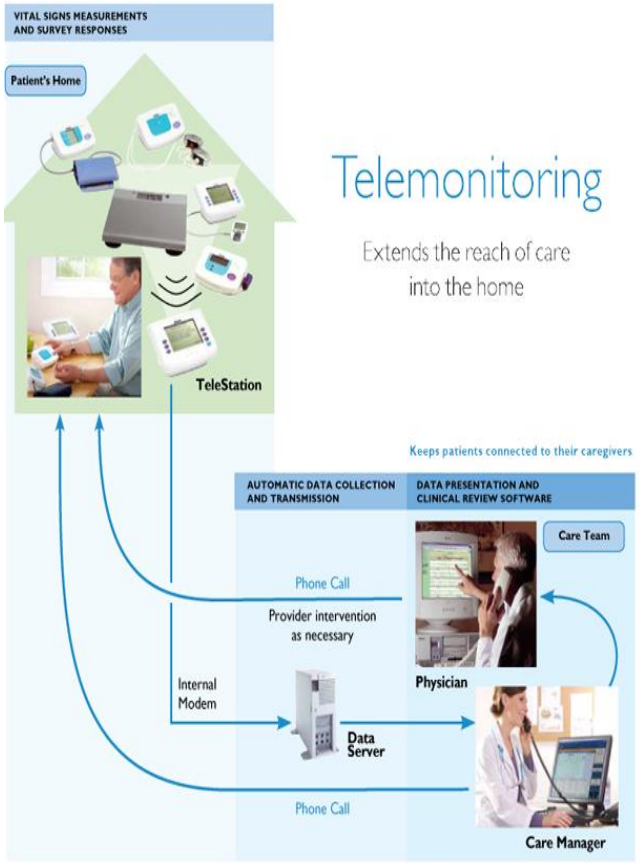
- Chronic Disease State
  - Heart Attack
  - Heart Failure
  - Pneumonia
  - COPD
  - ALL Admitted within 24 hours of Inpatient Discharge
- Joint Aftercare
  - Admitted within 24 hours of Inpatient Discharge
- Medication Reconciliation Needed
  - Completed in person within 24 hours of request



Remote Telemonitoring: How?

- **Store-It-Forward**
- **Remote Monitoring**
  - **Tele-Health**
- **Interactive**
  - **Tele-Visits**
- **Wellspan Call Button**

How Cont…


VITAL SIGNS MEASUREMENTS AND SURVEY RESPONSES
Patient's Home
TeleStation
Telemonitoring
Extends the reach of care into the home
Keeps patients connected to their caregivers
AUTOMATIC DATA COLLECTION AND TRANSMISSION
DATA PRESENTATION AND CLINICAL REVIEW SOFTWARE
Care Team
Phone Call
Provider intervention as necessary
Physician
Internal Modem
Data Server
Phone Call
Care Manager

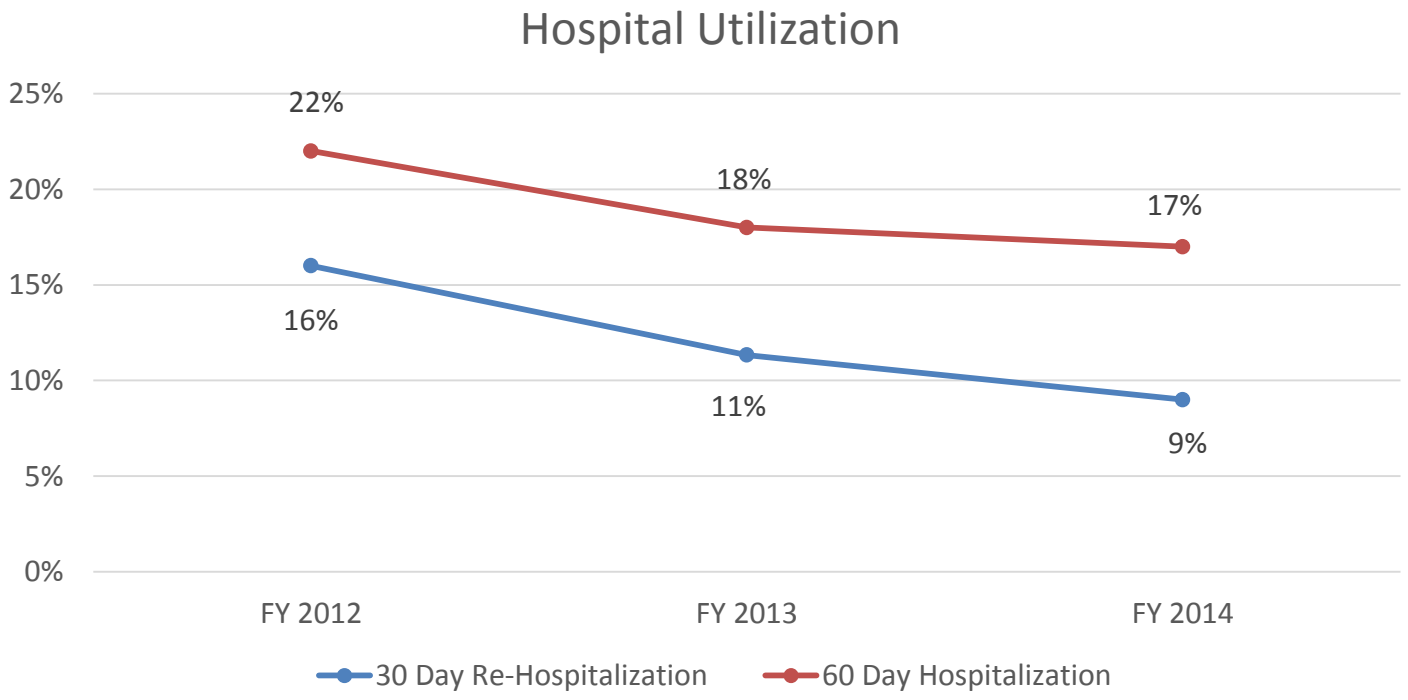

Integrated Telehealth Center
Home
Health System
Transitional Care
Trauma/ ED
ICU
MedSurg

Tele-Monitoring: Wellspan Call Button

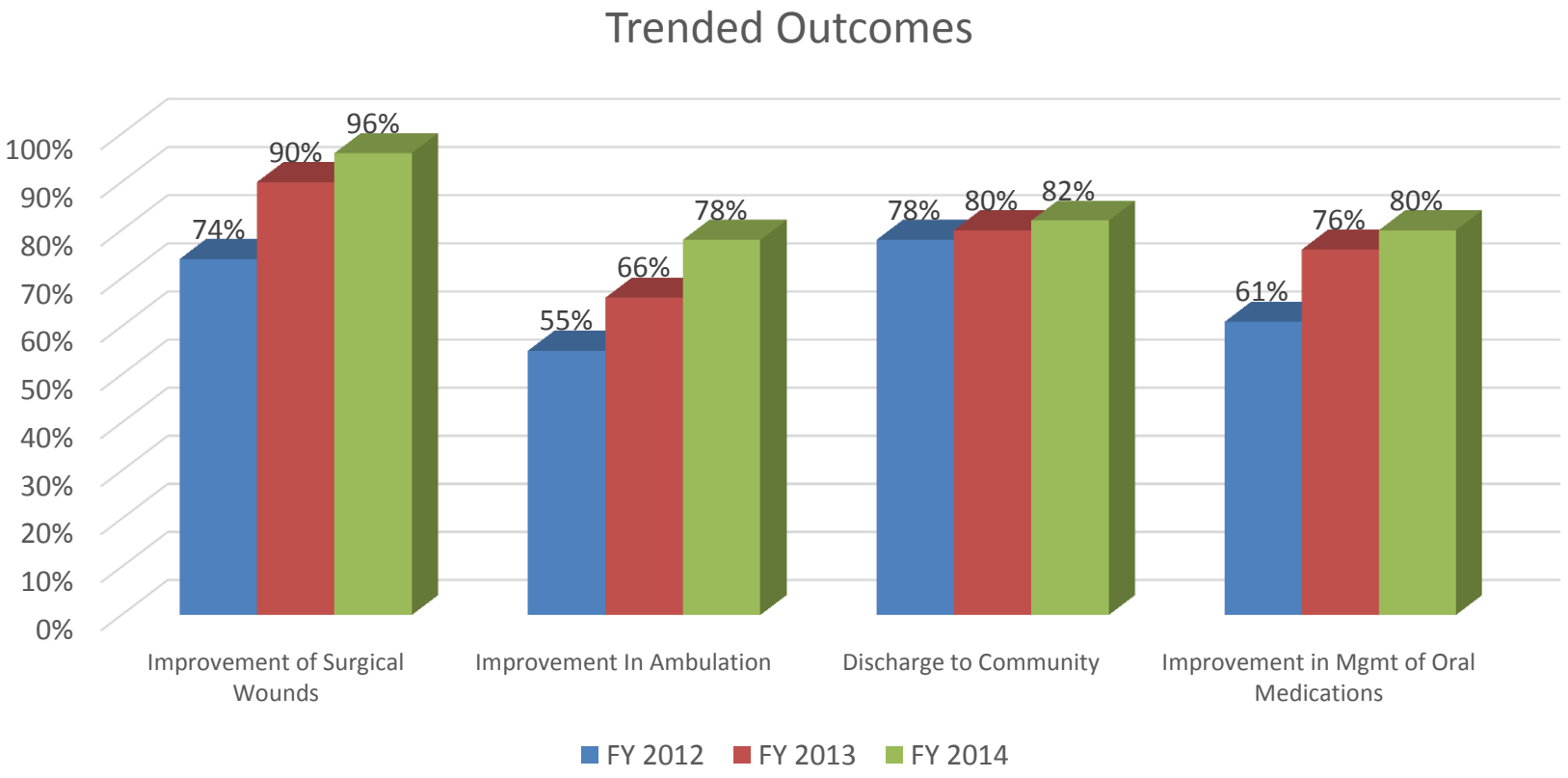
- Improved Transition
  - Hospital to Home
- Coordination of Care
  - Dr. Visits
  - Wellness & Coordination Calls
- Patient/Family Resource
  - Education
  - Link to community resources
- Medication management
- Link to early interventions

Results & Rewards

- 30 Day Re-Hospitalization
  - Decreased 7% over 3 years
- Overall Hospitalization
  - Decreased 5% over 3 years



Results & Rewards Cont.



Population Health: Decreasing Costs (3 year Study)

- Home Health
  - Decreased Cost by $78 p/visit ($3.04 million)
- Hospital
  - $20.56 million Total Savings

- Goals Achieved:
  - Timeliness Initiation of Care (within 48 hours of inpatient discharge)
    - From 89% to 96%
  - More patients remaining in the community
  - Quality of Patient Care Increased
  - Cost of Patient Care Decreased
  - Now able to treat more patients at better efficiencies

Questions?

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