

Providing Insight in a Changing Landscape

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September 15-16, 2022

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- ▶ Delivering High-Value Care
- ▶ Engaging Patients
- ▶ External Benchmarking
- ▶ Looking ahead

About Penn Medicine



ABOUT PENN MEDICINE

The University of Pennsylvania Health System includes:

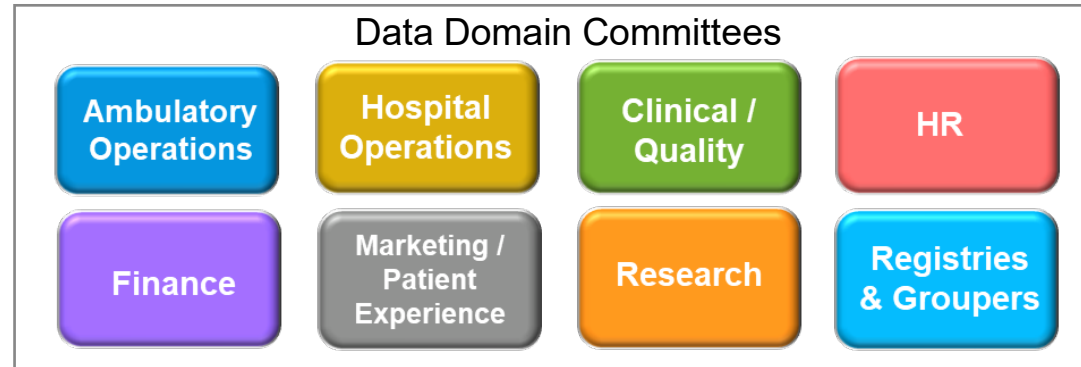
- Six Acute Care Hospitals
- Women's & Babies Hospital, Psych Hospital, Rehab Hospital, Behavior Health Hospital
- 4 Employed Physician Organizations (including a Faculty Practice Plan)
- Primary Care Provider Network
- Over 15 Regionally Distributed Multi-Specialty Facilities
- Over 200 provider locations
- Home Care, Rehabilitation, Hospice and a Nursing Home

Licensed Beds	3,400
Total Employees	37,500
Physicians	6,000
Total Admissions	140,000
Clinical Revenue	~\$9 Billion
Outpatient Visits	6.5 Million
Square Feet	Over 5.5 Million
Research Awards	\$910 Million

Penn Medicine Enterprise Analytics Journey

Need to develop consistent, enterprise-wide definitions and dashboards

- Began in 2018
- Created 8 Data Domain Committees



Composition

Operations led
Representation from all entities

Responsibilities

Operational ownership of metrics, definitions, and enterprise reporting
Establish consistent, system-wide definitions for key metrics & measures
Selection of metrics to be included in the data warehouse
Development of domain enterprise reporting/dashboards
Accountability and adjudication of any metric/dashboard issues

Partnering with Dimensional Insight

- Integrated with the work of the Data Domain Committees
- Clinical Leads, Penn Medicine analysts, Dimensional Insight triad
- Phased approach, rapid turnaround, iterative

Results:

1,502 enterprise metrics
177 dashboards
22 training videos
>20 training sessions
>1,000 active users



Quality

Launched Oct 2018
367 approved metrics
24 dashboards



Ambulatory

Launched Feb 2019
383 approved metrics
40 dashboards



Surgery

Launched Feb 2020
164 approved metrics
21 dashboards



ED

Launched Apr 2020
235 approved metrics
28 dashboards



Hospital

Launched Jul 2020
205 approved metrics
31 dashboards



ICU

Launched Jan 2022
148 approved metrics
33 dashboards

Changing Landscape in Health Care

The way providers are measured and paid for services is changing

- Traditionally, providers have been paid for the volume of services they provide (Fee for Service)
- Transitioning to a system where payments are based on quality / outcomes and providers are responsible for managing populations over time (Fee for Value ; Valued-Based Care)



How do providers succeed in this new environment?

- Educate physicians and nurses on value programs design
- Redesign clinical care ("pathways" / care coordination) to provide high-value care and reduce unnecessary variation
- Develop value program / populations analytics to measure performance and identify opportunities for improvement

Building Value Analytics Solutions



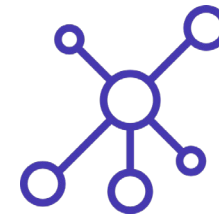
Internalize “externally” developed definitions of patient populations and outcomes



Report performance in current time period



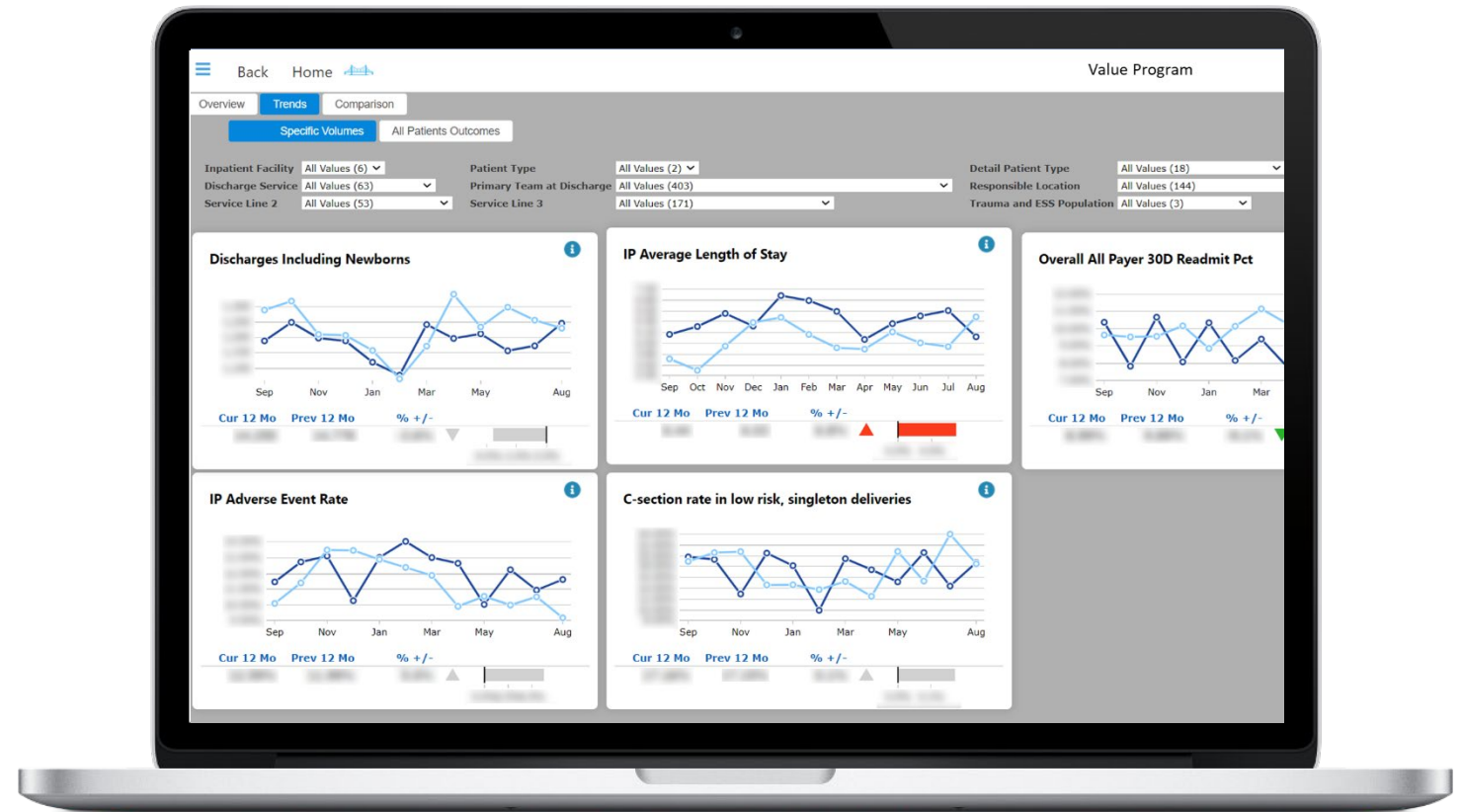
Track performance within these specific programs / populations against external and internal outcomes



Available adjacent to traditional entity performance

Value Program dashboards

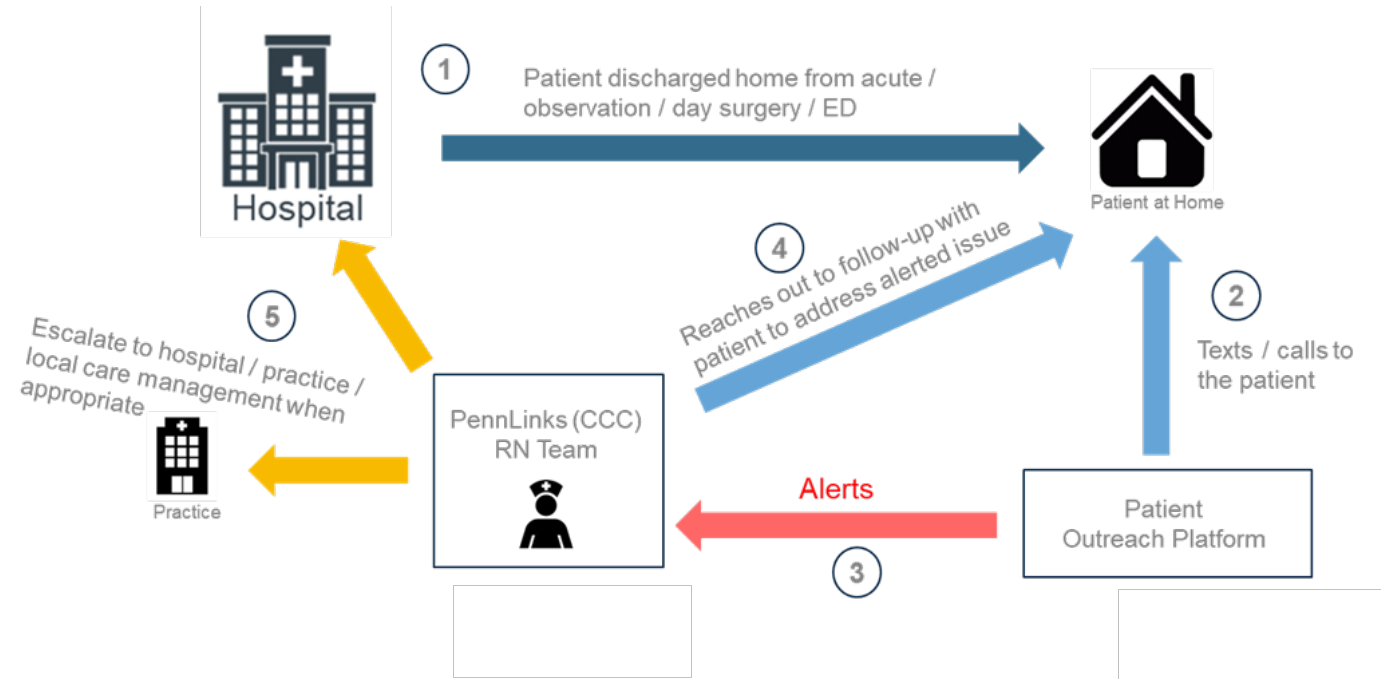
- Integrates external program definitions, along with internal quality data, in “real time”
- Enables performance improvement teams to drill down to the patient level
- Accelerates learnings and enables care redesign to improve outcomes and efficiency
- Available within Quality diveport



Patient Engagement

Penn Connects

- ▶ Outreach to patients after hospitalization/procedure/ED to quickly identify potential problems as patients transition from healthcare settings
- ▶ Automated texts and interactive voice responses are sent to patients after discharge (inpatient and/or ED) to identify issues.
- ▶ Based on the patient's response, an alert is triggered to a centralized nursing team. The nurse reaches out to the patient to diagnose, triage, and resolve/escalate the issue.

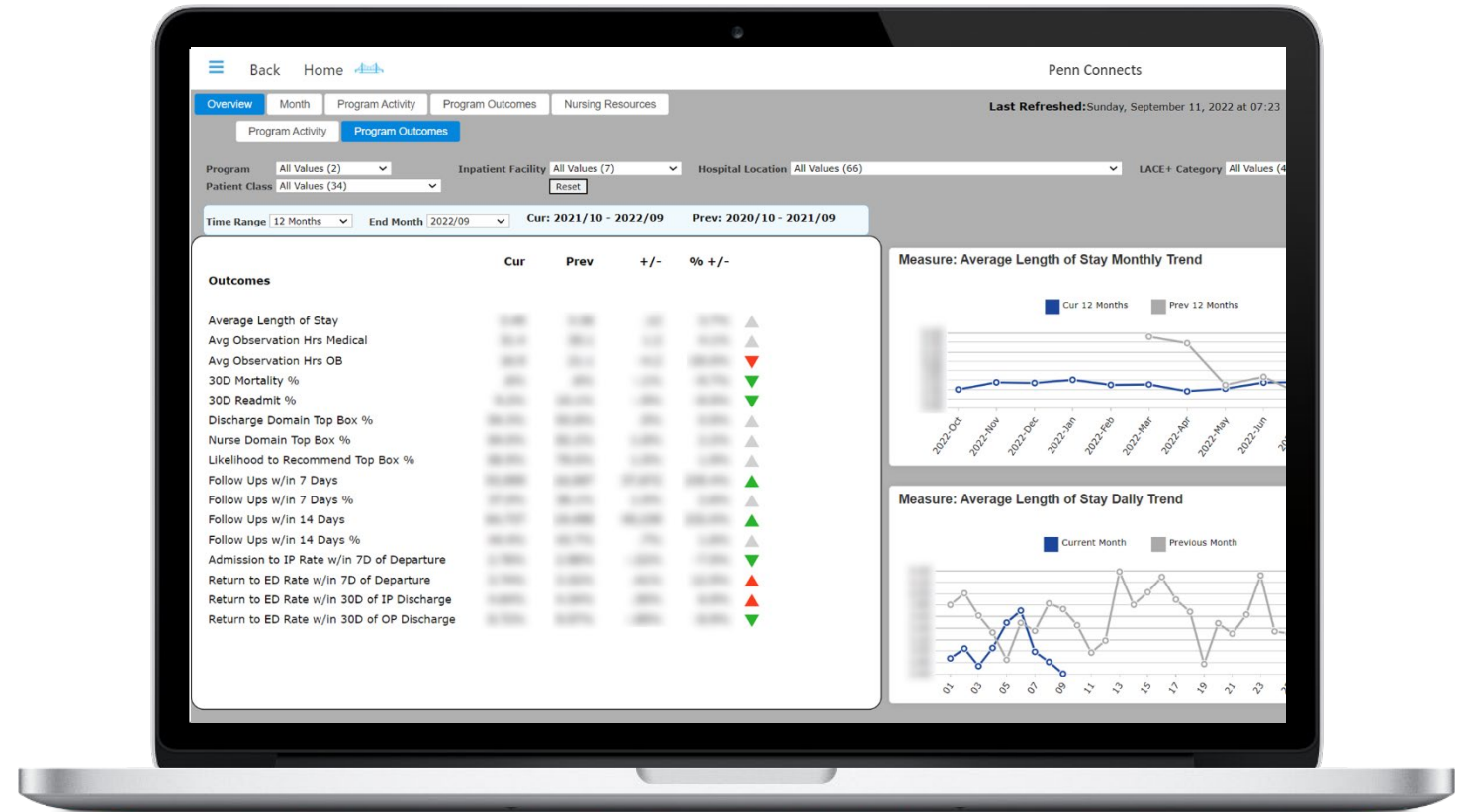


What outcomes has automated engagement been shown to impact?

- Fewer readmissions
- Improved patient experience
- Seamless transition for patients through post-acute period
- Care managers focusing on higher acuity / higher risk patients

Penn Connects dashboard

- Integrates external data with internal quality data
- Leverages already defined patient outcomes
- Shows performance at entity and unit levels
- Supports program modification to improve outcomes and efficiency



Impact: At one entity, this program has led to an 8% decline in readmissions, resulting in the prevention of over 350 readmissions since the start of the program



External Benchmarking

Why are external benchmarking / ranking / ratings important?

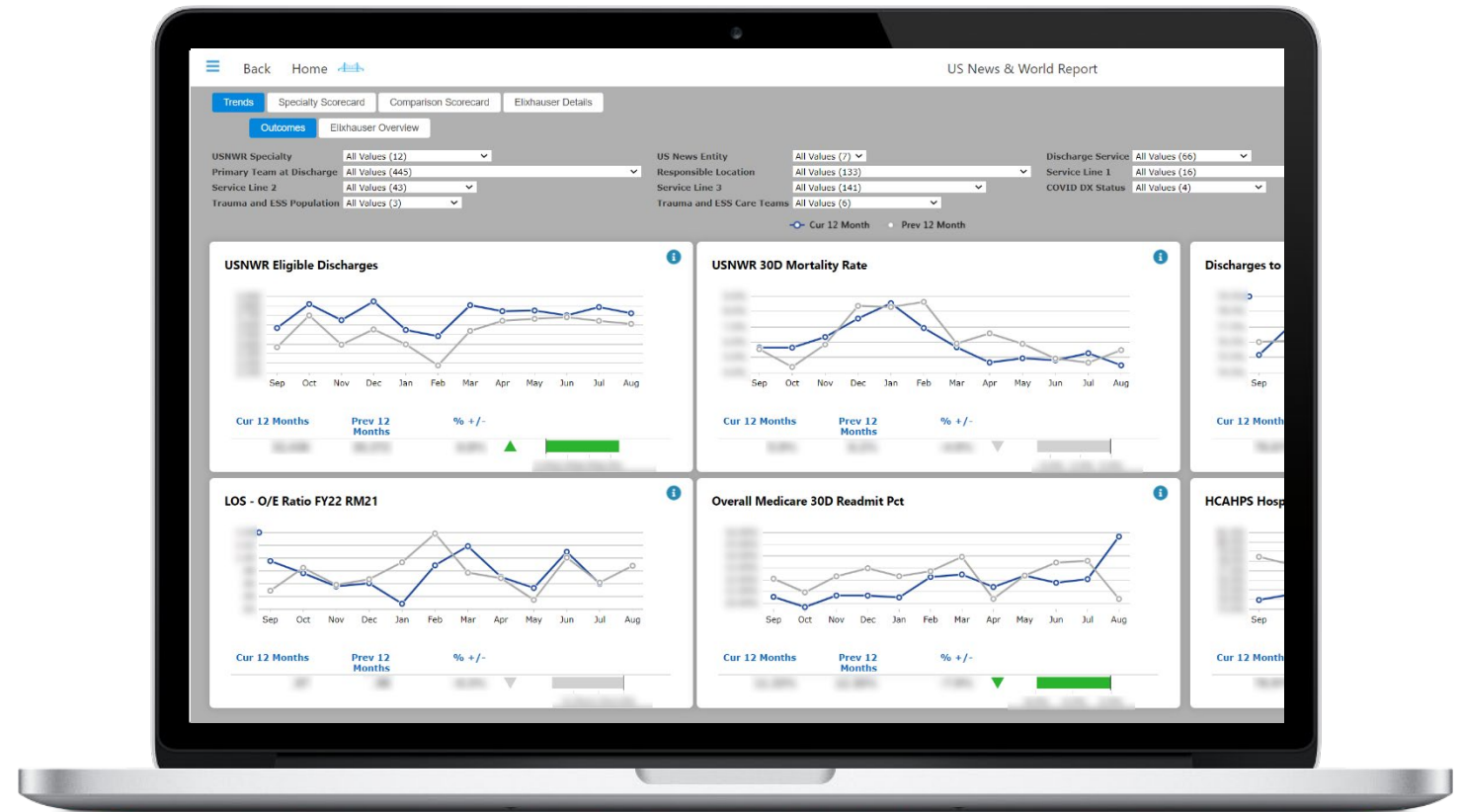
- Can be used as a proxy for quality
- Important for reputation as a publicly available source
- Can aid in recruitment, philanthropy, etc.

What are the challenges with external benchmarking analytics?

- External definitions of populations and outcomes
- Data is frequently dated
- May require integration of other data sources
- Measures change over time

US News & World Report Hospital Dashboard

- Identify patients in *11 Data-Driven Specialties* and *20 Procedures & Conditions* in "real time"
- Apply internal population / service definitions
- Track performance and identify opportunities
- Enable interventions to improve care



Summary

Looking ahead

- Over the last 4 years, our partnership with Dimensional Insight has been integral to our successful rollout of Penn Medicine Enterprise Analytics
- The changing health care landscape is going to require:
 - New metrics and analytics
 - Increasing integration of novel data sources
 - Needs to be available adjacent to traditional dashboards/metrics
- The Diver platform and Measure Factory have proven to be flexible and powerful to meet these requirements