



**Atrium Health**

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# It's quite remarkable to think back to our humble beginnings ...

when a group of ambitious, young clinicians, not being satisfied with the services available to the public, relentlessly lobbied for a new hospital to better meet the needs of the community.



“

This building is not a private enterprise ... It is a great, public compassion. Here is a living monument to the heart of the people.

A large crowd of people, mostly men in suits, are gathered in a large hall or auditorium. Many are holding up blue streamers and clapping, suggesting a celebratory event like a graduation or awards ceremony. The scene is filled with energy and joy. The text "Who We Are Today" is overlaid in white on a teal background.

**Who We Are Today**



**MISSION:**

TO **HEALTH**  
IMPROVE **HOPE**  
AND ADVANCE **HEALING**  
- **FOR ALL**

**VISION:**

TO BE THE **FIRST** AND **BEST** CHOICE FOR  
CARE

24

## In One Day at Atrium Health

37,800 Patient Encounters (1 every 2 seconds)

25,000 Physician Visits | 3,900 ED Visits | 700 Home Health Visits

475 New Primary Care Patients | 14,000 Virtual Care Encounters

91 Babies Delivered | 635 Surgeries

**\$5.6 Million**

Each day in uncompensated care  
and other benefits to our community.

# Size & Scope

69,800+ Teammates | 50 Hospitals

44 Urgent Care Locations | 45 EDs | 25 Cancer Care Locations

4,650+ Physicians | 17,000+ Nurses

**\$11.1 Billion**  
Net Operating Revenue

**\$2.9 Billion**  
In last 5 years

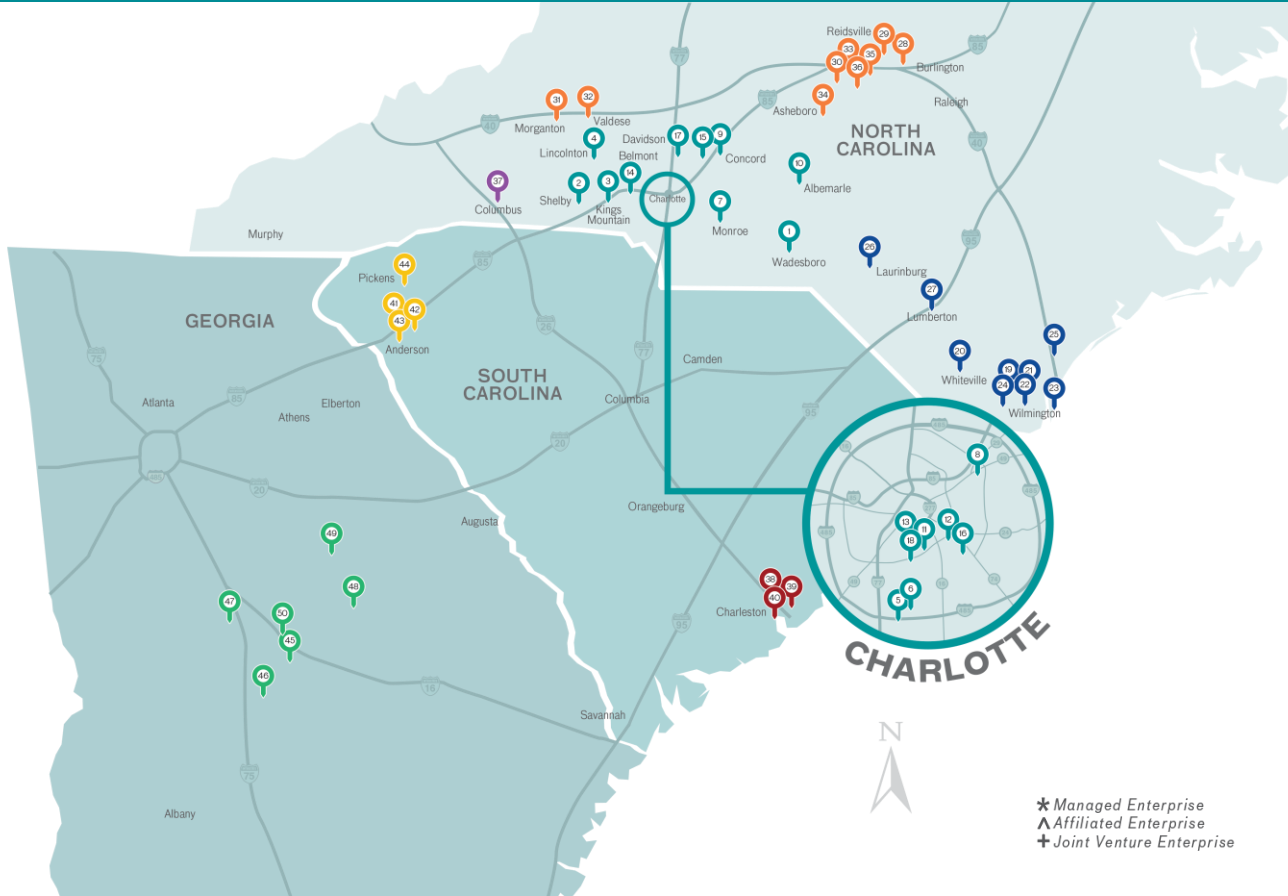
Invested into renovations, new care locations, equipment upgrades and other capital projects

*\*Includes Joint Venture and Affiliated Enterprises*



# Atrium Health

## 2019 Facilities & Locations



\* Managed Enterprise  
 ▲ Affiliated Enterprise  
 † Joint Venture Enterprise

NORTH CAROLINA

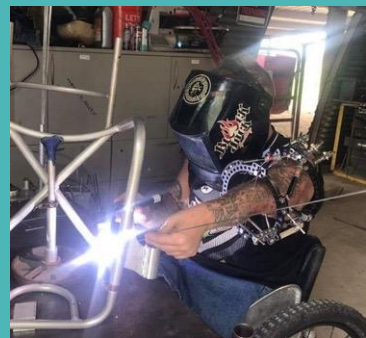
SOUTH CAROLINA

GEORGIA

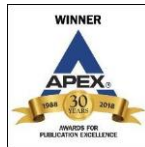
- CHARLOTTE**
1. Atrium Health Anson
  2. Atrium Health Cleveland
  3. Atrium Health Kings Mountain
  4. Atrium Health Lincoln
  5. Atrium Health Pineville
  6. Atrium Health Pineville Rehabilitation Hospital
  7. Atrium Health Union
  8. Atrium Health University City
  9. Carolinas HealthCare System NorthEast
  10. Carolinas HealthCare System Stanly
  11. Atrium Health's Carolinas Medical Center
  12. Carolinas Medical Center-Mercy
  13. Carolinas Rehabilitation
  14. Carolinas Rehabilitation-Mt. Holly
  15. Carolinas Rehabilitation-NorthEast
  16. CHS Behavioral Health-Charlotte
  17. CHS Behavioral Health-Davidson
  18. Levine Children's Hospital
- COASTAL**
19. Betty H. Cameron Women's and Children's Hospital<sup>▲</sup>
  20. Columbus Regional Healthcare System<sup>\*</sup>
  21. New Hanover Regional Medical Center<sup>†</sup>
  22. New Hanover Regional Medical Center Behavioral Health<sup>▲</sup>
  23. New Hanover Regional Orthopedic Hospital<sup>▲</sup>
  24. New Hanover Regional Rehabilitation Hospital<sup>▲</sup>
  25. Pender Memorial Hospital<sup>▲</sup>
  26. Scotland Memorial Hospital<sup>\*</sup>
  27. Southeastern Regional Medical Center<sup>▲</sup>
- TRIAD**
28. Alamance Regional Medical Center (Cone Health)<sup>\*</sup>
  29. Annie Penn Hospital<sup>\*</sup>
  30. Behavioral Health Hospital (Cone Health)<sup>\*</sup>
  31. CHS Blue Ridge-Morganton<sup>\*</sup>
  32. CHS Blue Ridge-Valdese<sup>\*</sup>
  33. Moses H. Cone Memorial Hospital (Cone Health)<sup>\*</sup>
  34. Randolph Hospital<sup>\*</sup>
  35. Wesley Long Hospital<sup>\*</sup>
  36. Women's Hospital (Cone Health)<sup>\*</sup>
- WESTERN**
37. St. Luke's Hospital<sup>\*</sup>
- LOW COUNTRY**
38. Bon Secours/St. Francis Hospital<sup>†</sup>
  39. Mount Pleasant Hospital<sup>†</sup>
  40. Roper Hospital<sup>†</sup>
- UPSTATE**
41. AnMed Health Medical Center<sup>\*</sup>
  42. AnMed Health Rehabilitation Hospital<sup>\*</sup>
  43. AnMed Health Women's and Children's Hospital<sup>\*</sup>
  44. Cannon Memorial Hospital (AnMed)<sup>\*</sup>
- CENTRAL**
45. The Medical Center, Navicent Health
  46. Medical Center of Peach County (Navicent Health)
  47. Monroe County Hospital (Navicent Health)<sup>\*</sup>
  48. Navicent Health Baldwin
  49. Putnam General Hospital (Navicent Health)<sup>\*</sup>
  50. Rehabilitation Hospital, Navicent Health



# FOR ALL



# REPUTATION OF EXCELLENCE



# Population Health

## Local Problem: Readmissions

# Creating Population Visibility

## HealthIntent Platform

### Aggregate and normalize



### Create and apply intelligence



### Act and measure



# Identifying Patients



## Meet Joe

- **Highest ED utilizer in the Atrium Health System**
- **1500+ service visits** within Atrium Health
- Jan – April 2018 (120 calendar days) = **104 ED visits**
- Other 16 days spent inpatient or observation
- ED, Inpatient, and Observation Facility Charges from 2015-2017 = **\$1,570,900**
- YTD 2018 charges = **\$366,125**

# Understanding His Story



- ✓ PTSD
  - ✓ Overwhelming anxiety
  - ✓ Hypochondriasis
  - ✓ Major Depressive Disorder
  - ✓ Alcohol Use Disorder
- 

Joe comes to ED because of an overwhelming fear he will die of numerous medical ailments

He lives in his car and moves between Atrium Health parking decks to have quick access to the ED

Joe says that the only thing that helps him feel normal is coming to the ED every day and having a doctor reassure him that he will be okay



# Connecting the Dots for Joe

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ED Visits since June 2018

CARE  
TEAM  
MEETINGS

PARC  
STAFFING  
SCHEDULED

HOUSING  
OBTAINED

DAILY  
BEHAVIORAL  
HEALTH  
THERAPY

ASSIGNED  
PRIMARY  
CARE

DAILY  
COMMUNITY  
PARAMEDICINE

CELL PHONE  
FOOD STAMPS  
MEDICAID, SSI

# And the Results Speak For Themselves

**85**

Total enrollment of patients in 2018

**28**

Graduated Patients  
(defined as achieving maximum goals of the program and/or obtaining insurance)

**\$1M**

Financial Savings in ED Charges

**55%**

Decrease in Hospital and ED Utilization

**AND**

Additional Patients are pending for Enrollment into the Program





# Other Keys to Success

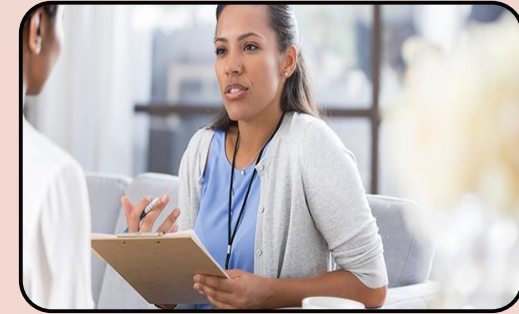
# Identifying High ED Utilization



**Create visibility within the data to identify patients as frequent utilizers**



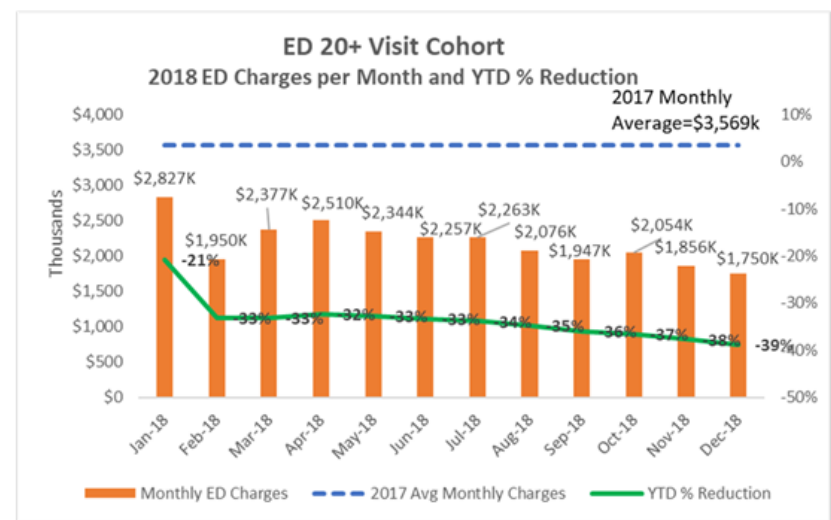
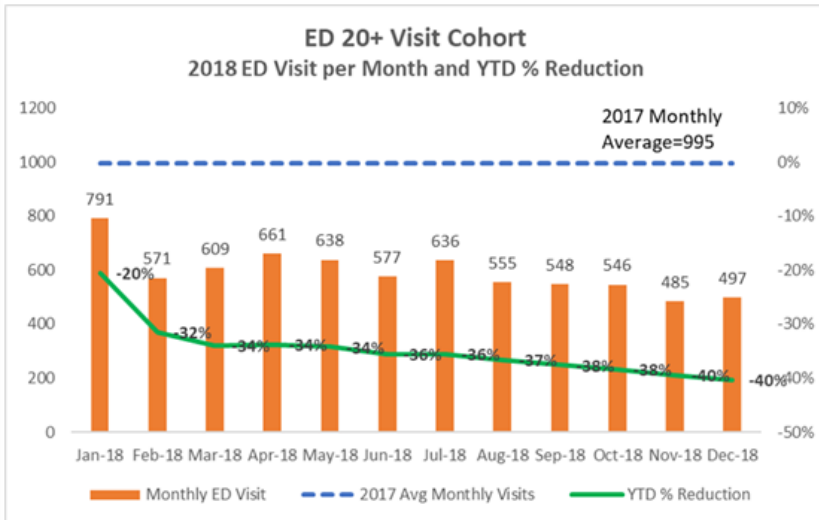
**Define a plan to impact each patient at their level and connect them to appropriate care in order to impact their visit volume**



**Understand the underlying issues, including social determinants, that may be affecting this subset of patients to provide them with Population Health Management**

# Outcomes: 20+ Visit High ED Utilizers (2018)

## 4824 fewer Visits, \$16.6M Charge Reduction



# Identifying Multi-Visit Patients (MVPs)



**Create visibility within the data to identify patients as frequent readmissions (46% of all readmissions)**



**Define a plan to impact each patient at their level and connect them to appropriate care in order to impact their visit volume**



**Hold monthly meetings to discuss treatment plans and interventions for those readmitting**

# Outcomes: Multi-Visit Patients (MVPs) (2019)

- **38% Reduction in Visits**
- **27% Reduction in Spend**
- **Average Length of Stay upon Readmission: 6 Days**
- **2,430 Fewer Bed Days**



# Focusing on Readmissions

## Post Discharge Follow Up

Discharge Order  
Generated from  
Acute Care Physician



Automated  
Order for  
Scheduling



Discharge Follow-Up  
Appointment  
Scheduled and Sent to  
Patient  
(Text or RoboCall)



Follow-Up  
Appointment



### Status Report:

Scheduled Discharge Follow Up with PCP: 70-80%

Arrival Rate within All Risk Bands:

- 81.9% Within 30 Days of Discharge (20% Baseline)

# Preventing Readmissions

**Care  
Management  
Program**

**Community  
Resource Hub**

**Paramedicine**

**Virtual  
Primary Care**

**One-on-One  
RX**

**Uber/Lyft  
Pilot**

**Transitions  
Clinic**

**Remote  
Monitoring**

**Complex  
Chronic Clinic**

**Social  
Isolation Pilot**

**Food  
Pharmacy**

**Mobile  
Health Units**

# Why Readmissions?



**18** percent of Medicare patients discharged from the hospital have a readmission *within 30 days* of discharge, accounting for **\$15 billion** in spending.

- P4P (HRRP)
- VBP (MSPB)
- Insurance contracting
- Benchmarked & Public Quality Metric
- One of most significant drivers of higher cost (payer perspective)

Medicare Payment Advisory Commission. 2007. *Report to the Congress: Promoting Greater Efficiency in Medicare.*

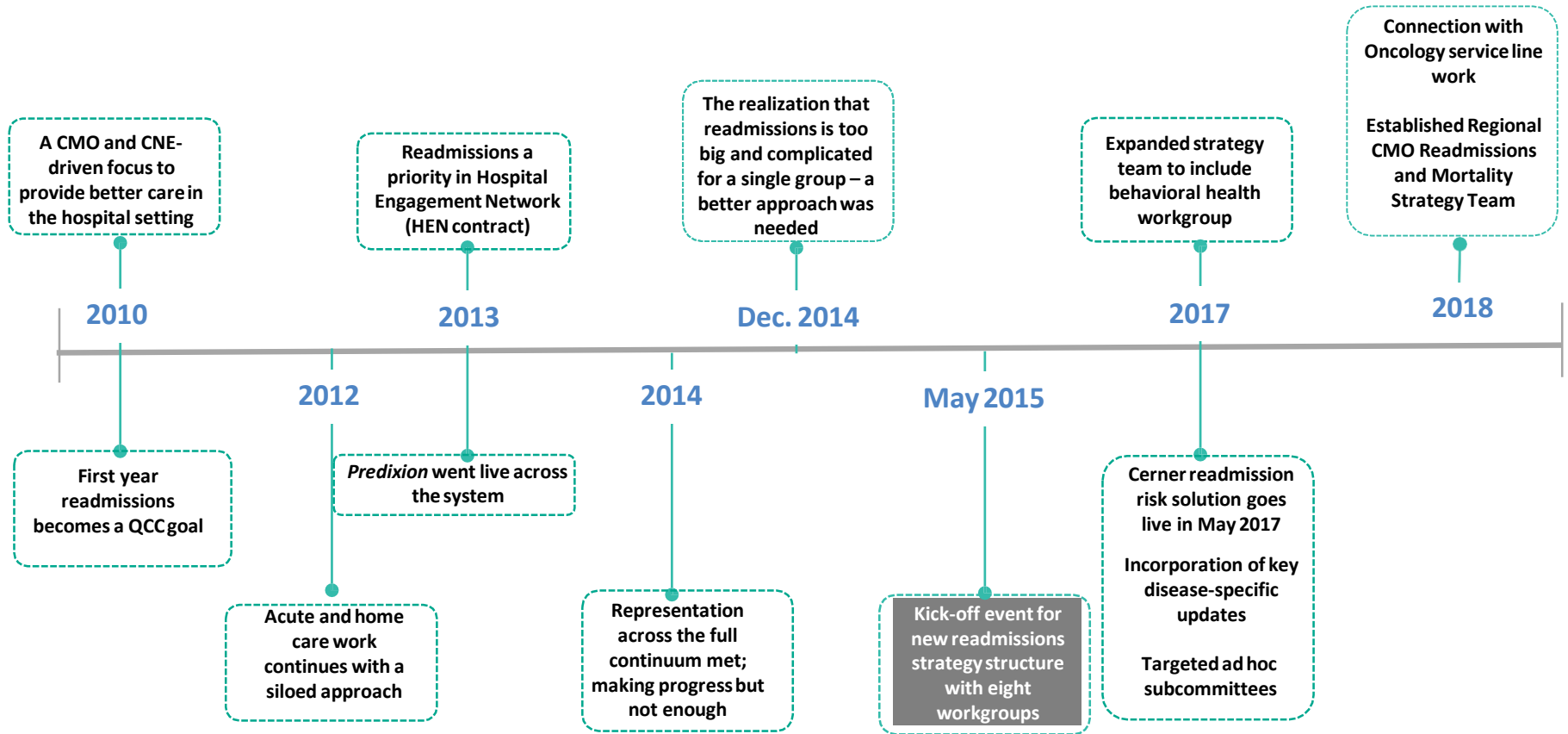


# Why Readmissions?



The **Right** thing to do. **Better Care for Our Patients.**

# A Brief History of Atrium Health's Readmissions Work



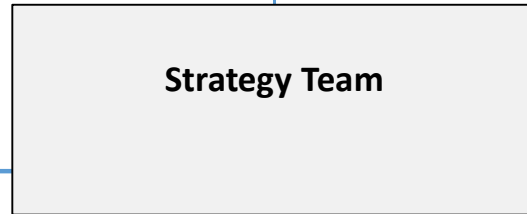
# Build and Design

# Atrium Health Readmissions Committee Structure



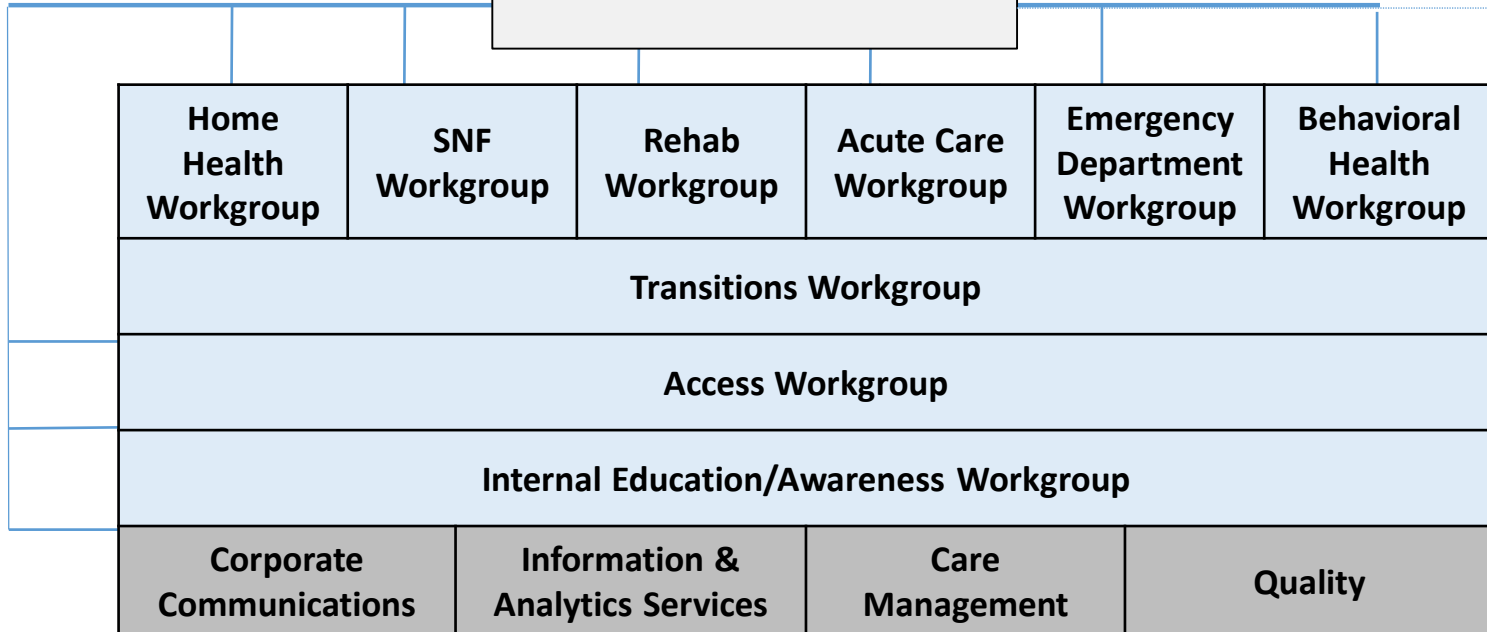
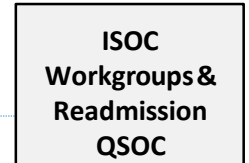
Role & Responsibility:

- To set objectives for the work
- To provide feedback and direction to Strategy Team
- To provide overall oversight and issues resolution



Role & Responsibility:

- To provide subject matter expertise and input into development of strategy
- To develop recommended strategic position



Role & Responsibility:

- To utilize standard methodology-- approach to achieving key objectives
- To develop recommended strategic position
- To execute the 2015 work

Role & Responsibility:

- To participate on and support workgroup efforts

Team Approach  
Transitions Workgroup Example

# Transitions Workgroup Example

## Team Members

### Physician Chair:

Stephanie Murphy, DO

### Co-Chair:

Colleen Hole, RN

### Quality Lead:

Danielle Kendall

## Purpose of Workgroup

- To reduce readmissions by efficiently improving transitions of care and specialty access across the continuum of the patient experience
- In Scope:
  - Any transitions within 30 days of discharge among Home, SNF, Rehab, Hospice and Emergency Department, including Home Health services; this includes multiple transitions among sites within the 30 days
  - Ambulatory specialty care access
  - **NOTE:** 80% of readmission opportunities are patients who are discharged to home/self care and Home Health Care
- Out of Scope:
  - Discharged patients < 18 years
  - Behavioral Health access
  - Primary Care follow-up access

# Collaboration Prevents ED Visits and Readmissions

- Newly diagnosed heart failure patient referred to home health post-hospital stay
- Home health nurse notified MD of 10lb weight gain and shortness of breath
- MD ordered additional 80mg dose of IV Lasix, not available in local pharmacies.
- Home health reached out to transitions partners paramedicine program
- Paramedics made home visit, administered IV Lasix and handed patient back off to home health for ongoing monitoring



# Transition Services Clinic



# Transition Services Clinic

- Multidisciplinary Approach to Care - Beyond Traditional Medical Office Visits, an Integrated Practice Unit
  1. Discover the root cause for the patient's failure in our current healthcare system
  2. Support/Alleviate those causes
  3. Disease state management and education
  4. Management of complications and subacute needs/medical comorbidities in a pro-active way
  5. Behavioral Health and Palliative Care Collaboration/Support
- Unique Care Delivery Model
  1. In office visits
  2. Virtual Visits
  3. Community Paramedicine Support
- Rooted in Research and Quality

Atrium Health's Transition Services  
Clinic Attendance in 2018



*Patients at high risk for readmissions are identified by an embedded risk model in Atrium Health's EHR prior to discharge, after which they are contacted by a patient navigator to set up an appointment with the transition services clinic.*

# Transition Services Clinic Data Use

- **Use of Big Data at the Inception:**

- Patient Selection predicated on validated readmission risk factors:
  - > 4 Inpatient encounter in 6 months
  - > 10 chronic medications
  - > 4 ED visits in 6 months
  - > 15 Medical Problems
  - Predixion Risk Score > 0.8
- Must stay true to patient selection to target resources to appropriate patients and support ROI/accurately measure success

- **Continued Use of Data:**

- Cerner Risk Score
- New Patient Populations requiring support
- Maintenance of impact

# Utilization of People

- Medical Provider
- Community Paramedicine
- Pharmacist
- Care Manager RN
- Referral Coordinator
- Palliative Medicine
- Social Worker
- Health Advocacy
- Behavioral Health

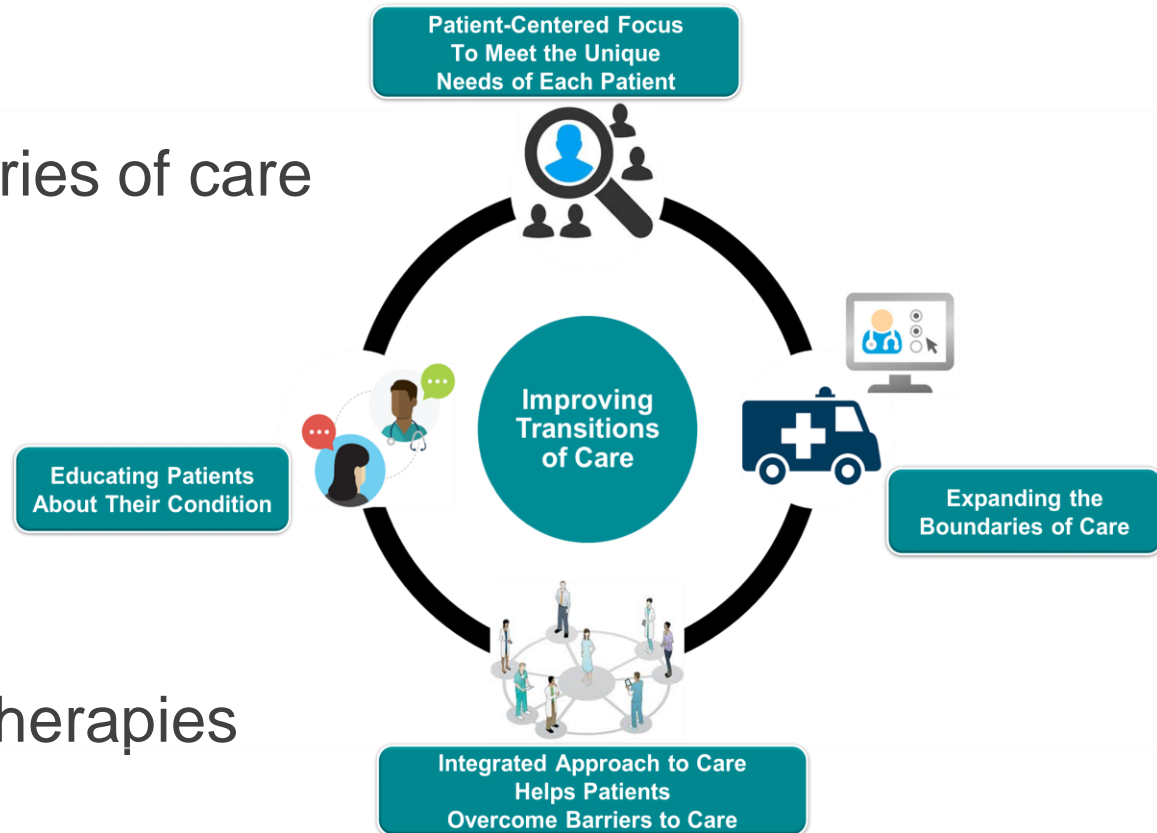


# Transition Services Clinic Process

- High risk patients receive a referral to transition services either by inpatient provider or automated by embedded tool in EMR
- Patient is met in the hospital by Care Manager RN/Navigator
- Referral visits occur in the clinic or at home within 72 hours of discharge
  - Telemedicine
  - Community Paramedic
- Screening with the PHQ-9 test for behavioral health needs
  - Virtual Behavioral Health Integration availability
- Comprehensive medication review by pharmacist
- Addressing social determinants of health
  - Community resources
  - Address emotional needs
  - Access to support resources: walkers, shower chairs, etc
  - Transportation services: Uber, Lyft, public transportation,

# Utilization of Process

- Patient centered focus
- Expanding the boundaries of care
- Integrated approach
- Patient education
- Virtual Visits
- In-office and in-home therapies



# Utilization of Health IT

- Transition of Care order form and workflows within the EHR
- Utilization of virtual care
- Predictive Models for Readmission
- HealthIntent Platform
- Analytics



# Transition of Care Referral

The screenshot shows a medical software interface for a "Transition Clinic Referral Form". The top left has a sidebar menu with categories like "Ambulatory", "A&B", "Admission", "Behavioral Health", "Cardiology", "Child", "HIM eTOI", "Infection", "OB/GYN", "Oncology", "Patient Education", "Public Health", "Pneumology", "Surgery", "Vascular", and "All New". The main area displays the form with fields for "Enrolled" (Appointment Made, Duplicate of direct referral) and "Outreach Date" (set to 04/16/2018). A list of forms to be completed is shown on the right, including ALS Functional Rating Scale Form, Amb-Anticoagulation Communication, Amb-Anticoagulation New Form, Amb-Anticoagulation Enrollment Form, Amb-Community Paramedicine Form, Amb-Diabetic Foot Exam Form, Amb-Diabetic Retinal Eye Exam Form, Ambulatory Case Discharge Instruction Form, Ambulatory Infusion Documentation, Ambulatory Infusion Intake Form, Ambulatory Medication Administration, Ambulatory Nurse Visit Form, Pain Agreement Form, Patient Health Questionnaire - PHQ9, Patient Health Questionnaire Add - PHQA, Pediatric Symptom Checklist - PSC17, PHQ9 Clinician Assessment, Phone Message Form, Physician Office Lab Result, Sim-Minuta Walk Test, Sleep Medicine Quality Form, Telehealth Solutions Phone Form, and Travel History Form.

The screenshot shows a patient list table with the following columns: Note, Opt, Out, Name, Location, DOB, Age, Sex, MRN, Attending Physician, and Admit Date/Time. The table lists various patients, including those with notes like "RXCTEST, B0TESTW0" and "IBAMRXCLV, LDAO5 ACVT".

Note	Opt	Out	Name	Location	DOB	Age	Sex	MRN	Attending Physician	Admit Date/Time
			RXCTEST, B0TESTW0	SNM S104 01	7/25/1984	33 years	Female	0010970374	CALDWELL, WILLIAM M MD	1/31/2018 9:38 AM EST
			IBAMRXCLV, LDAO5 ACVT	QIN N100 12	1/13/1957	61 years	Male	0000723576	WYMAN, ANDREW JAMES MD	9/27/2017 12:52 AM EDT
			RCEVTI, TVRRBV F	TTX 10922 01	9/14/1941	76 years	Female	0002770692	CAKIR, BERIL MD	9/13/2017 6:58 PM EDT
			ZZPTST, DISCHARGE PLANADULT	CLIN Doc Nsg Unit 021 02	1/24/1964	54 years	Female	988776533	TEST, CMC MD	4/11/2018 1:47 PM EDT
			REGRESSION, ORDERSDOC APRIL	CLIN Doc Nsg Unit 021 01	1/1/1988	30 years	Male	24	TEST, BETH TEST MD	4/11/2018 8:05 AM EDT
			ZCHARCA, RHDLVLPD	4TC 4913 01	9/25/1975	42 years	Female	0002890551	MEHTA, ALPA A MD	9/12/2017 3:37 PM EDT
			CLARITY, SEPSS	SNM S103 01	12/17/1974	43 years	Female	0010951308	UPDAW II, ROBERT JAMES MD	10/4/2017 9:23 AM EDT
			ZZPTST, DISCHARGE PLANNINGINFANT	CLIN Doc Nsg Unit 021	4/7/2018	10 days	Male	9949484848	TEST, CMC MD	4/11/2018 1:56 PM EDT
			ZZPTST, CRYSTAL DXA	CLIN Doc Nsg Unit 020	2/12/1974	44 years	Female	810	TEST, MD FOUR	4/9/2018 4:19 PM EDT
			ZZPTST, FRIOLIES	CLIN Doc Nsg Unit	1/1/1960	58 years	Male	45564	TEST, BETH TEST MD	4/9/2018 10:34 AM EDT
			zzMaternity Tracker Default		3/3/1990	28 years	Female	765		
			ODRBYD, PSTVL	QIN N100 09	1/30/2002	16 years	Male	0001866948	WOODSON, JAMES V MD	9/25/2017 7:00 PM EDT
			WWFCEVLFDAQXQTH, DONTPKVO	ZZPowerPlan ZZ01 1	1/1/1950	68 years	Male	0000000100	TEST, BETH TEST MD	4/19/2012 11:01 AM EDT
			PENDING, APPROVAL	SNM S107 01	7/30/1971	46 years	Female	0010952169	WALKER, GENA MD	9/28/2017 10:26 AM EDT

# Transition Clinic Referral

Patient List Type

Select a patient list type:

Custom  
Location  
**Provider Group**  
Relationship

---

Provider Group Patient List

\*Provider Groups [CHS Tran  
 Encounter Types [IP - Inpati  
 Medical Services  
 Locations  
 Time Criteria  
 Admission Criteria  
 Discharged Criteria  
 Use Best Encounter

Chotiner Family Health Care  
 Chowan Hospital Fam Prac  
 Chowan Hospital Family Practice Group  
 Christenbury Eye Center  
 Christie Pediatrics  
 Christensen Family Medicine

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Provider Group Patient List

\*Provider Groups [CHS Tran  
 Encounter Types [IP - Inpati  
 Medical Services  
 Locations  
 Time Criteria  
 Admission Criteria  
 Discharged Criteria  
 Use Best Encounter

Hospice  
 IDT - Inpatient BHC-Mercy  
 IP - Inpatient Admission  
 IPB - Inpatient Behavioral Health  
 IPD - Inpatient Detox  
 IPF - First Step Inpatient  
 IPH - Inpatient Mt Holly  
 IPN - Inpatient NE  
 IPP - Inpatient Psych  
 IPR - Inpatient Rehab  
 IPS - Inpatient Skilled Nursing  
 ISA - Inpatient Substance Use  
 IVS - Infusion Series  
 KDS - Dialysis Series  
 LCI Patient Navigation  
 LTC - Long Term Care

Enter a name for the list: (Limited to 50 characters)  
 CHS Transition Services

Back **Next** Finish Cancel

Provider Group Patient List

\*Provider Groups [CHS Tran  
 Encounter Types [IP - Inpati  
 Medical Services  
 Locations  
 Time Criteria [Only display p  
 Admission Criteria  
 Discharged Criteria  
 Use Best Encounter

None  
 Include patients that have met the criteria within the last

TEST, EB	Age	Sex	MRN	Attending Physician	Admit Date/Time
TEST, EB	33 years	Female	0010970374	CALDWELL, WILLIAM M MD	1/31/2018 9:28 AM EST
TEST, EB	31 years	Male	0000723576	WYMAN, ANDREW JAMES MD	9/27/2017 12:52 AM EDT
TEST, EB	76 years	Female	0002770692	CACKR, BERL MD	9/13/2017 6:58 PM EDT
TEST, EB	54 years	Female	988776533	TEST, CMC MD	4/11/2018 1:47 PM EDT
TEST, EB	30 years	Male	24	TEST, BETH TEST MD	4/11/2018 8:05 AM EDT
TEST, EB	42 years	Female	0002890551	MEHTA, ALPA A MD	9/12/2017 3:37 PM EDT
TEST, EB	43 years	Female	0001951308	UPDAW II, ROBERT JAMES MD	10/4/2017 9:23 AM EDT
TEST, EB	10 days	Male	9949484848	TEST, CMC MD	4/11/2018 1:56 PM EDT
TEST, EB	44 years	Female	810	TEST, MD FOUR	4/9/2018 4:19 PM EDT
TEST, EB	58 years	Male	45564	TEST, BETH TEST MD	4/9/2018 10:34 AM EDT
TEST, EB	68 years	Male	0000600571	WALKER, GENA MD	2/27/2018 2:44 PM EST
TEST, EB	28 years	Female	765		
TEST, EB	16 years	Male	0001866948	WOODSON, JAMES V MD	9/25/2017 7:00 PM EDT
TEST, EB	4 years	Female	0000000100	TEST, BETH TEST MD	4/19/2012 11:01 AM EDT
TEST, EB	46 years	Female	0010951269	WALKER, GENA MD	9/28/2017 10:26 AM EDT



# Readmission Predictive Modeling

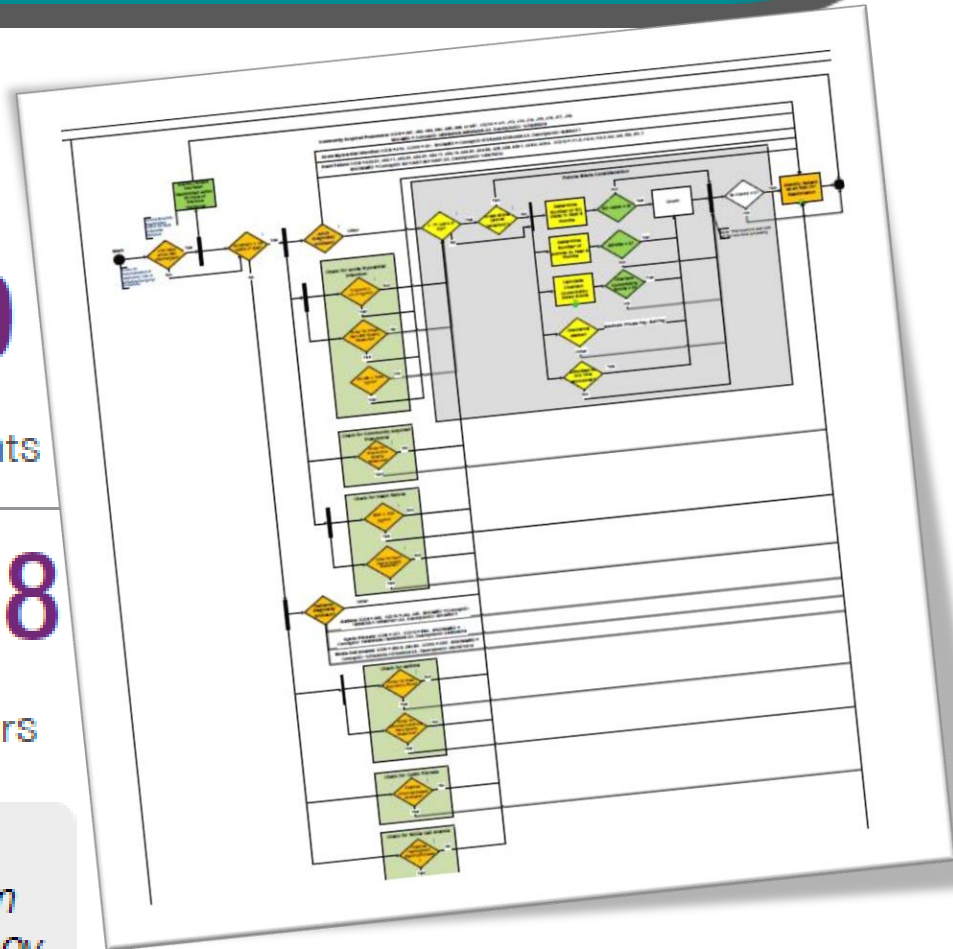
## Atrium Health's Transition Services Clinic Attendance in 2018



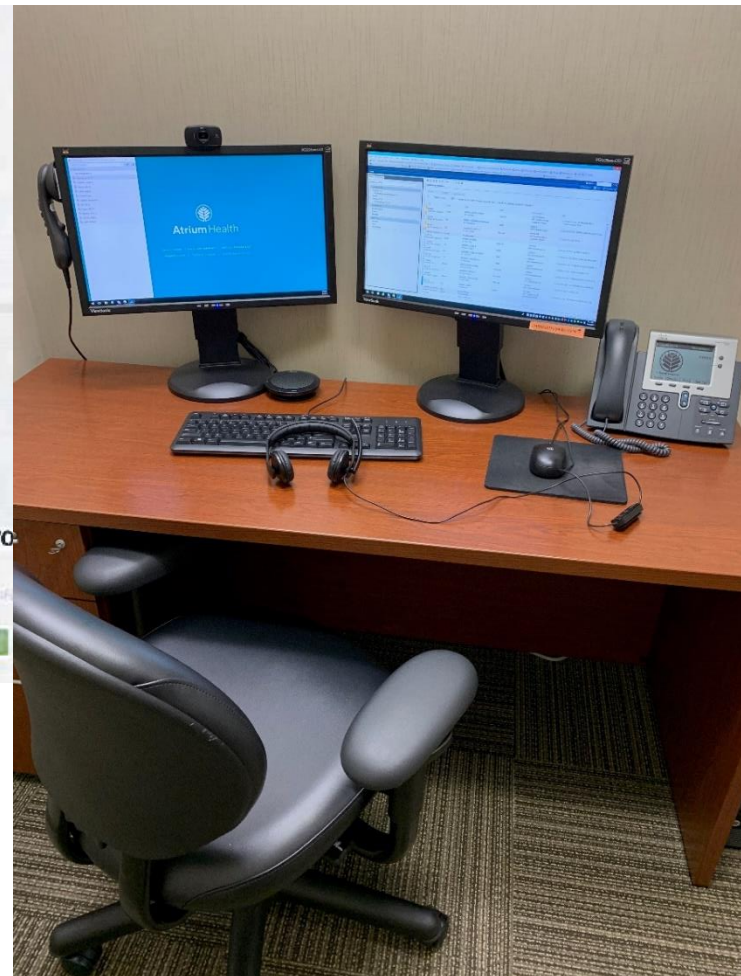
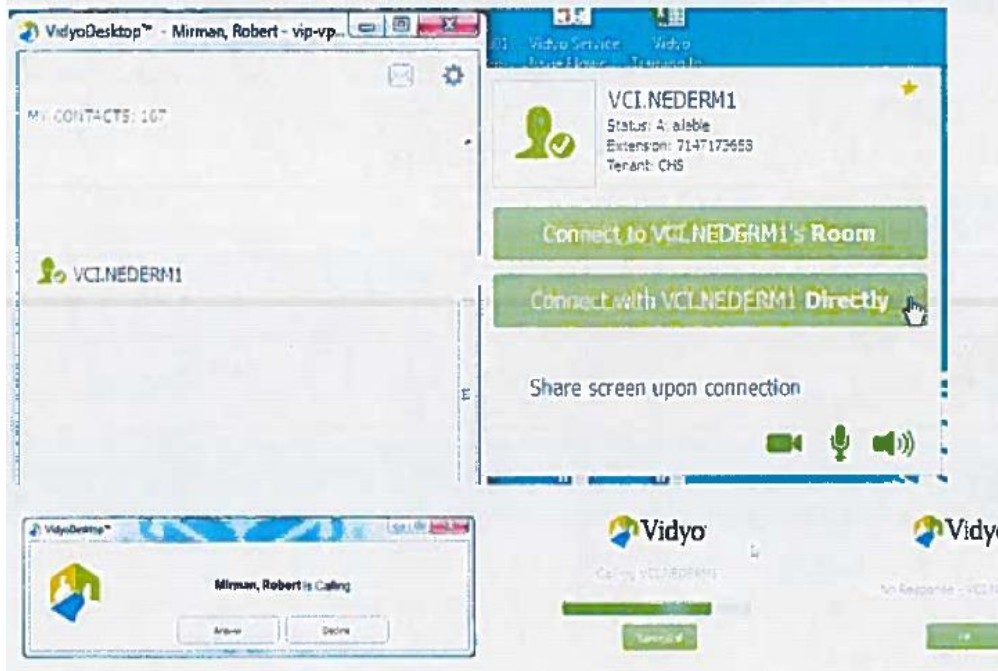
**990**  
Patient  
Enrollments

**2,608**  
Total  
Encounters

*Patients at high risk for readmissions are identified by an embedded risk model in Atrium Health's EHR prior to discharge, after which they are contacted by a patient navigator to set up an appointment with the transition services clinic.*

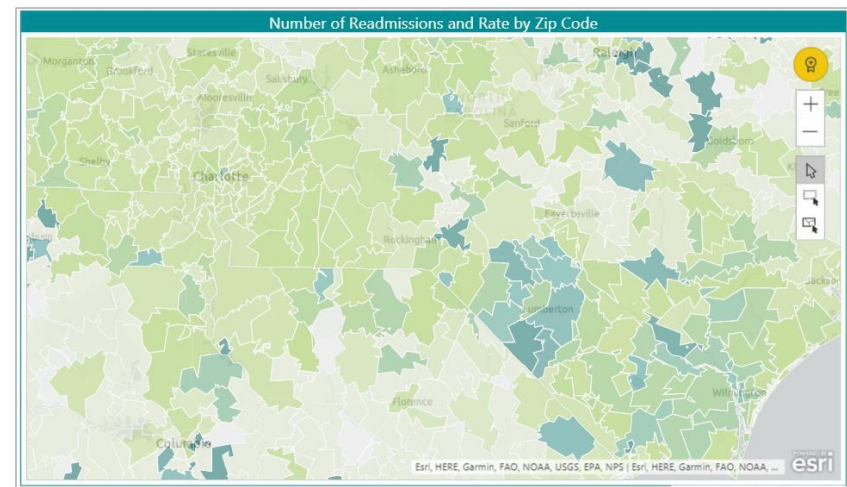
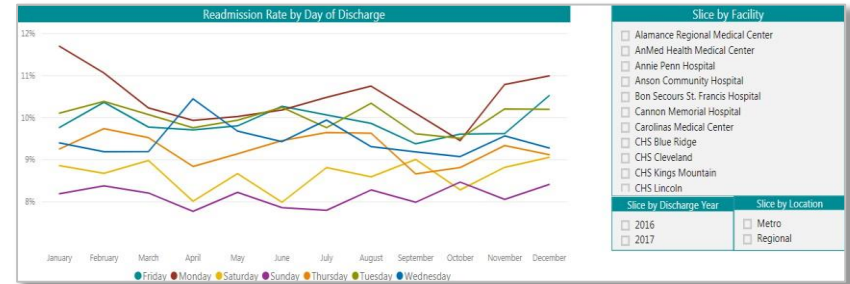
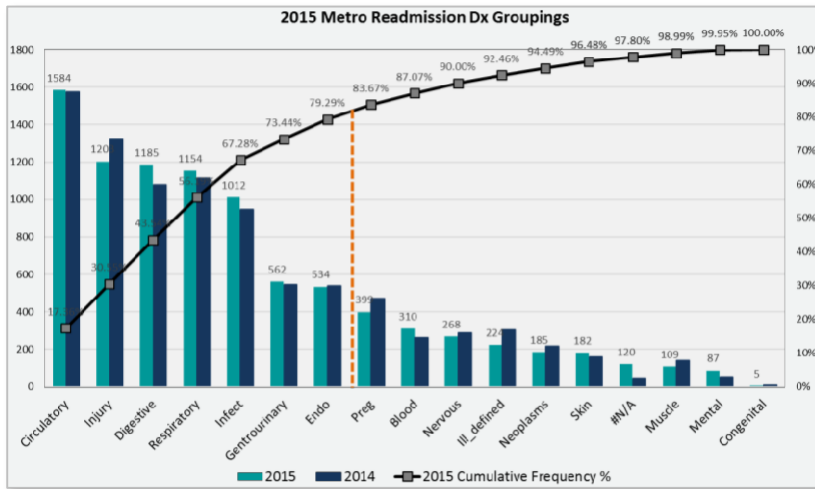


# Virtual Care

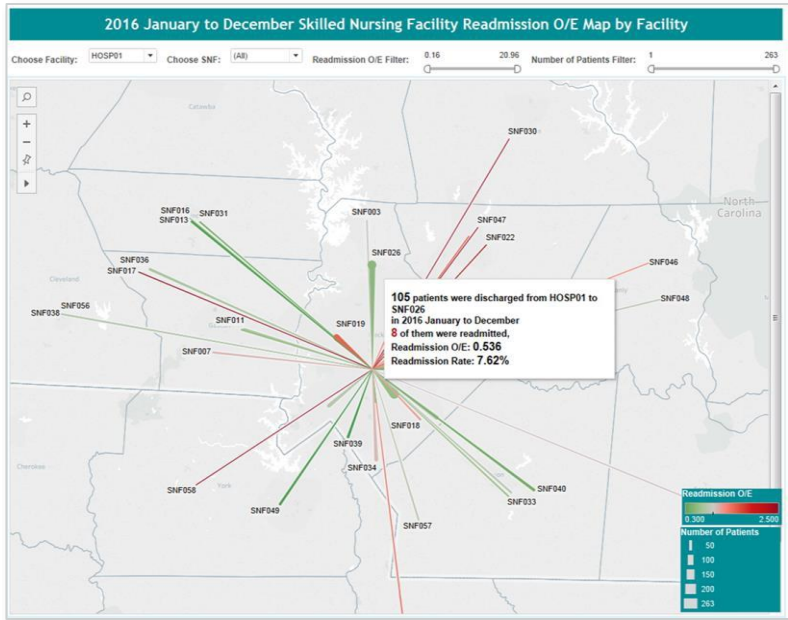


# Atrium Analytics

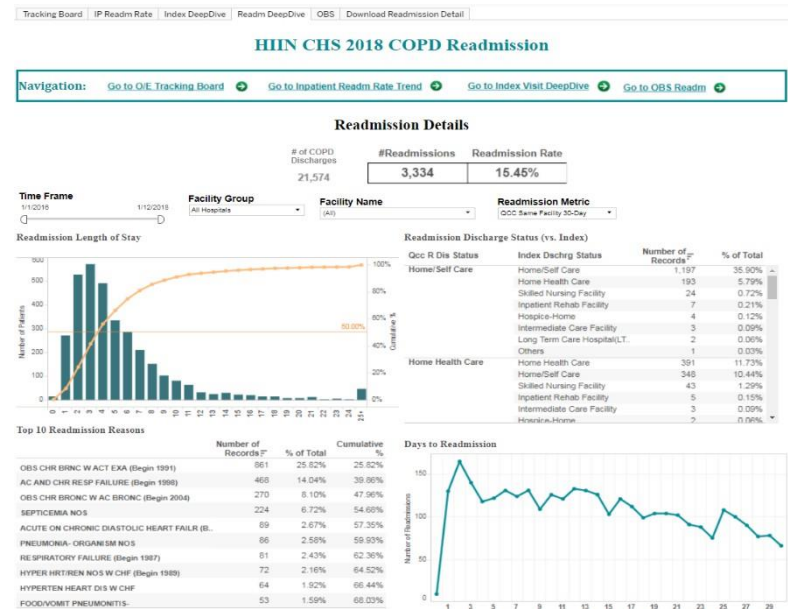
# Data Chart Book Highlights Trends and Opportunity



# Self Service Dashboards and Visualization Tools



SNF/Acute dashboard allows for either a SNF or acute facility centric view of readmissions.



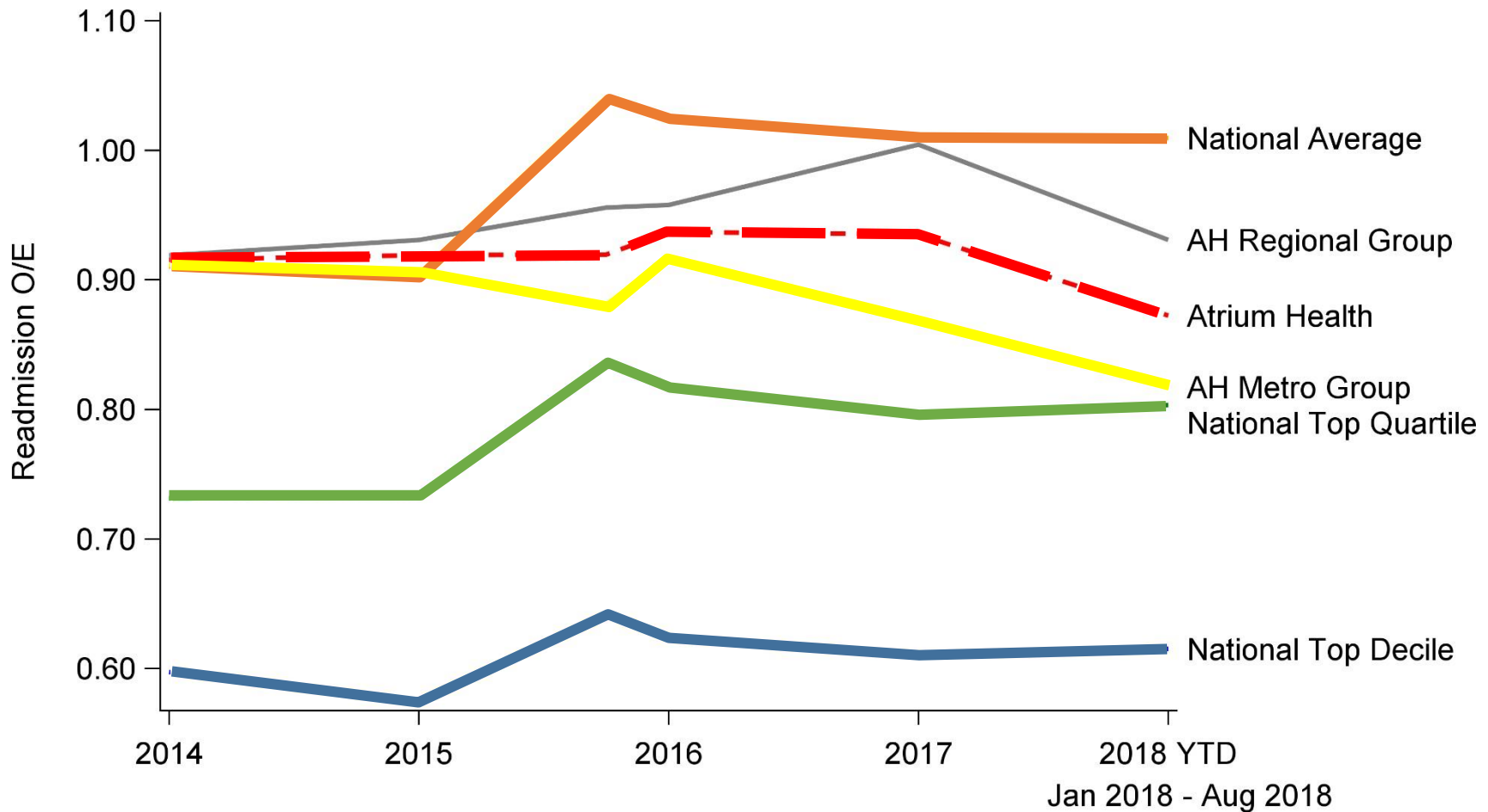
COPD dashboard provides a comprehensive view of the COPD readmissions.

# Analytics to Drive Improvement



# Value Derived

# Atrium Health & Metro Acute Care Unplanned Readmissions O/E System and National Benchmark Performance

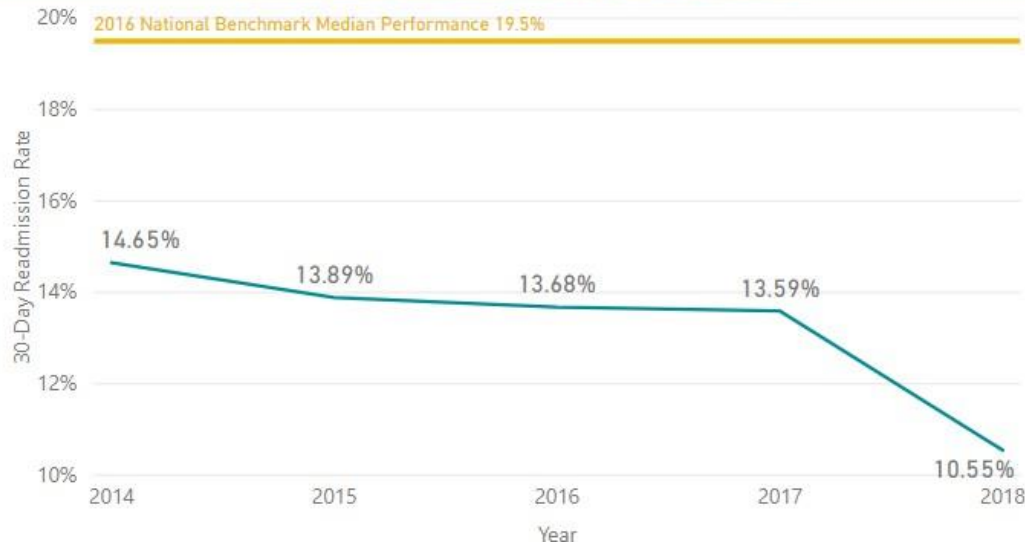


- Uses the 2017 O/E
- ICD-10 Transition October 1, 2015



# COPD Readmission Trend – Yearly

Metro COPD Readmission Rate Yearly Trend



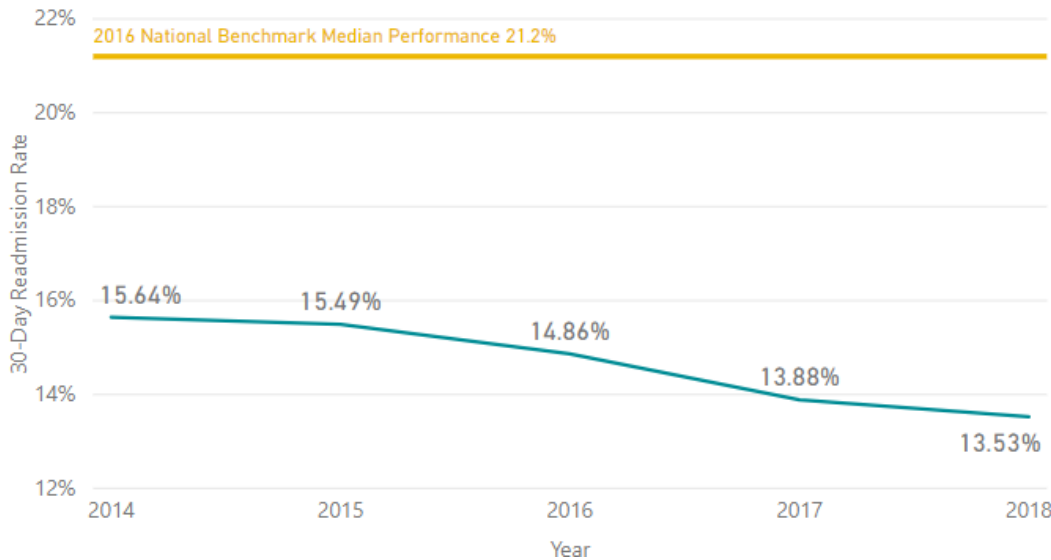
Metro COPD Readmission Rate & Yearly Percent Change

Year	Readmission Rate	Yearly % Change
2014	14.65%	-
2015	13.89%	5.19%
2016	13.68%	1.51%
2017	13.59%	0.66%
2018 (Jan – Jul)	10.55%	22.37%

Reference for national benchmark performance: Truven Health; 100 Top Hospitals, 2018 A National Benchmarks Report; [https://truvenhealth.com/Portals/0/assets/2018\\_National\\_Sample\\_Report\\_022618.pdf](https://truvenhealth.com/Portals/0/assets/2018_National_Sample_Report_022618.pdf)

# HF Readmission Trend – Yearly

Metro HF Readmission Rate Yearly Trend



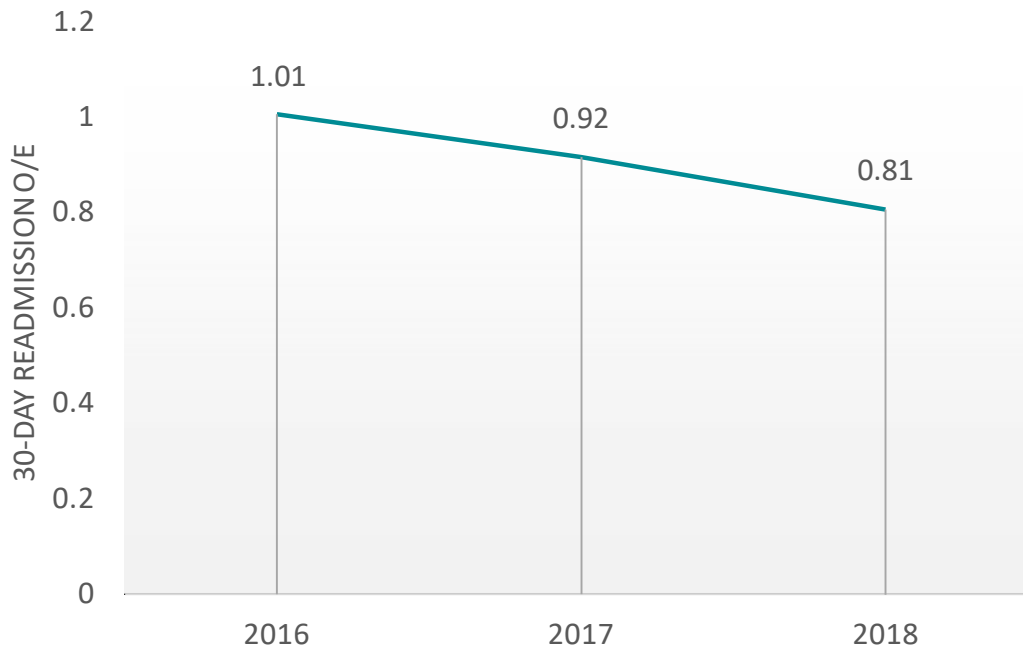
Metro HF Readmission Rate & Yearly Percent Change

Year	Readmission Rate	Yearly % Change
2014	15.64%	-
2015	15.49%	0.96%
2016	14.86%	4.07%
2017	13.88%	6.59%
2018 (Jan – Jul)	13.53%	2.52%

Source for national benchmark performance: Truven Health; 100 Top Hospitals, 2018 A National Benchmarks Report; [https://truvenhealth.com/Portals/0/assets/2018\\_National\\_Sample\\_Report\\_022618.pdf](https://truvenhealth.com/Portals/0/assets/2018_National_Sample_Report_022618.pdf)

# Solid Tumor Readmission O/E

System Wide Solid Tumor Readmission O/E

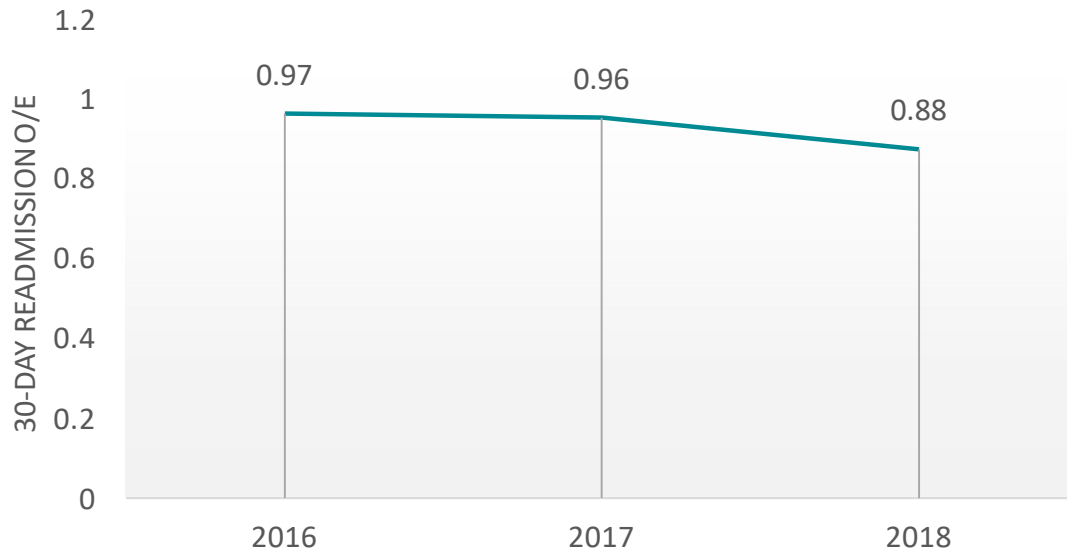


System Wide Solid Tumor Readmission O/E & Yearly % Change

Year	Readmission O/E	Yearly % Change
2016	1.01	-
2017	0.92	8.91% ↓
2018 YTD	0.81	11.96% ↓

# Oncology: Malignant Hematology Yearly

System Wide Malignant Hematology Readmission O/E



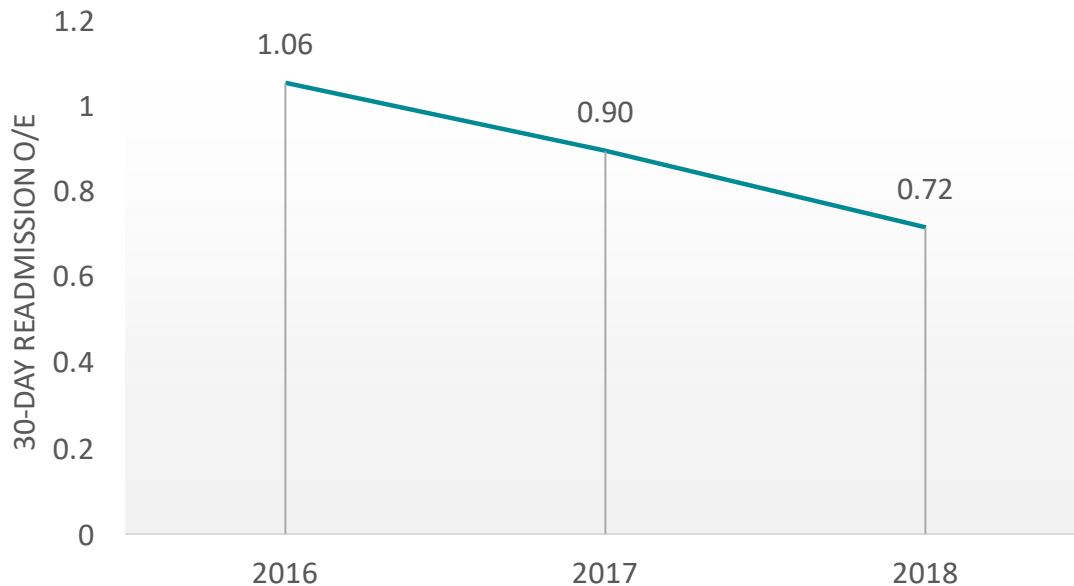
System Wide Malignant Hematology Readmission O/E & Yearly % Change

Year	Readmission O/E	Yearly % Change
2016	0.97	-
2017	0.96	1.03% ↓
2018 YTD	0.88	8.33% ↓

\*Numbers are pulled from Premier using Primary and Secondary Diagnosis

# Oncology: Sickle Cell - yearly

System Wide Sickle Cell Readmission O/E



System Wide Sickle Cell Readmission O/E & Yearly % Change

Year	Readmission O/E	Yearly % Change
2016	1.06	-
2017	0.90	15.09% ↓
2018 YTD	0.72	20.00% ↓

\*Numbers are pulled from Premier using all SCD Diagnosis

# Sickle Cell and the Transition Services Clinic

LEVINE CANCER INSTITUTE



Atrium Health

## Sickle Cell Disease – Bridging the Gap Post Discharge

Atrium Health- Main  
Levine Cancer Institute Sickle Cell Enterprise and CHG Transition Clinic

### Introduction

Sickle cell disease (SCD) is a genetic blood disorder; it primarily affects persons of African descent. About 100,000 Americans are affected by SCD. 1,400 adults and 400 children with SCD receive care within Atrium Health.

SCD causes frequent, unpredictable severe pain episodes and can damage multiple organs, leading to early death and high morbidity. Pain is the most common complication of SCD and a frequent cause of acute care utilization.

Hospital admissions and readmissions are very high for SCD. There are 60,000 admissions/year in the US. 50% of admissions are related to acute pain.

Cronin et al. reported a 64% admission rate and 28% re-admission rate for adults with SCD. Missed follow-up appointments with a SCD provider are associated with increased admission rates (Cronin R, Harkins JS, Byrd R. Hematology. 2019 Dec; 24(1):189-198).

The Average lifetime cost of care for an individual living with SCD is ~\$400,151 and increases with age. 80-90% of these costs are due to acute care utilization, which is often poorly reimbursed or not reimbursable, as most patients are either publicly insured or uninsured. (Kauf TL, Coates TD, Huzarh L et al., Am J Hematol. 2009 Jun; 84(6):323-327).

At Atrium Health's CMC-Main campus, the average adult with SCD (18-35 years) has 6 ED visits and 6 admissions/year, with a 30-day readmission rate of 36.2%. (2012-2013). Having more than three hospitalizations for VDC

year portends increased risk of early death (NHLBI Expert panel report). High SCD readmission rates are caused by [a] early discharge, [b] secondary infections, [c] opioid withdrawal syndrome, and [d] unrecognized untreated medical comorbidities.

A strategy to reduce SCD readmission rates (Leschke et al.) incorporates discharge planning with early outpatient clinic follow-up after a SCD discharge.

We brainstormed creative solutions to leverage existing integrated resources within Atrium Health with co-management between the hospitalist team (CHG Transition Program) and SCD team (SCD Enterprise).

The CHG Transition clinic was established as a cross team collaboration (led by Dr. Stephanie Murphy) to provide quick outpatient follow-up appointments for high-risk/high-cost individuals with congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), and SCD.

Strategy involved cross-training of providers and provider teams to handle the subspecialty phase of an acute exacerbation of one's condition in the outpatient setting, with the goal to facilitate more efficient and coordinated discharge planning and follow-up that would reduce acute care admissions and readmissions, and ultimately improve patient outcomes.

### Project Goals

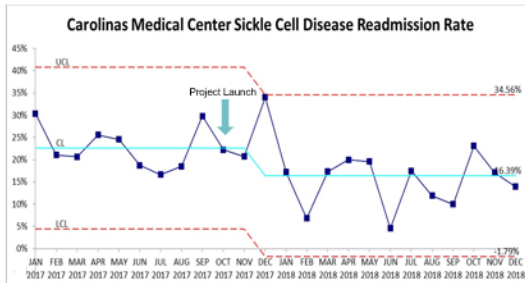
The CHG – SCD Transition Clinic was established to provide prompt follow-up for individuals with SCD with a sentinel admission. We hypothesize that patients with SCD who were seen by a provider at CHG Transition program within 72 hrs. of discharge would experience a 20% reduction in their 14-day and 30-day readmission rates, resulting in improved quality of life, reduced mortality, and improved patient experience.

### Results and Outcomes

Currently, there have been over 39 patients with SCD who have been followed in our CHG – SCD Transition Clinic. By December 31, 2018 the readmission rate for SCD at Atrium Health Main reduced from 23.7% during 2017 to 15.27%. This represented a 35.5% reduction in 30-day readmission rates, far exceeding our proposed goal of a 20% reduction.

### Lessons Learned

- Collaboration is critical to success of this program.
- SCD patients respond best to people they know and are suspicious of healthcare. Thus, leveraging the community-based organization (CBO) was a vital part of engaging patients to participate in the TC program.
- Awareness of the program was initially slow. Actions were taken to advertise the services highlighting benefits specific to SCD (sooner appointments, medication refill, avoiding return ED visits).
- Historically, SCD management has been the sole responsibility of the SCD provider/department with no involvement from primary care or hospitalists post-discharge. As people with sickle cell disease are living longer, over 60% are 18 and older and will require inter-disciplinary care.
- Limitations in access/supply of SCD experts available to manage this volume of patients without collaboration with primary care providers drive the new model.
- This is the first known program of its kind, with intentional collaboration between sickle cell providers and hospitalists to provide coordinated and timely follow-up for this population.
- This is also the first paramedicine program that has been leveraged to ensure optimal post-acute care for sickle cell population.
- This partnership increases access to care, to include behavioral health, social work, pharmacy services, and case management. By having timely post discharge follow-up and subsequent reduction in readmission, overall opioid use for patients is reduced.



### Improvement Process

- We reviewed several index cases of year-round "cyclic withdrawal" after a prolonged admission (prompt readmission within 7 days presenting with nausea, vomiting, diarrhea, low-grade fever, generalized pain and instability) consistent with opioid withdrawal syndrome, precipitated by abrupt discontinuation of opioids following continuous use of IV opioids to manage an acute pain crisis. These cases were deemed unlikely to be from a seasonal viral syndrome.
- A common thread among all cases was a report by the patient that "I ran out of my medication... they didn't have no appointment in sickle cell clinic 30 next month so no one can write me my pain medication." These patients were being discharged with the required 5-day pain medication supply; however, they had no SCD follow-up appointment for several weeks after discharge.
- The Transition Clinic (TC) was introduced in the summer of 2017. After several face-to-face meetings between the TC Medical Director (Stephanie Murphy, DO), Clinic Administrative Director (Stephanie McCall), and Nurse Practitioner Tess James, the SCD team was given a tour of the new TC facility.
- The collaborative team outlined the proposed clinical pathway for a SCD patient who will be seen in TC, including a review of the most likely diagnosis and appropriate nuanced interventions specific to the patient with SCD.
- A series of PDSA cycles demonstrated the best way to "advertise" the availability of the program services and implement the program for the SCD population in the hospital prior to discharge.

### Contact Info

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### Acknowledgements

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# Lessons Learned

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- Analytically-driven, personalized care delivers value
- Identify the high-risk patients early and begin their transition upon or prior to admission
- Uncover issues that lead to failed outpatient management
- Identify and care for the patient's subacute clinical needs
- Empower the patient to self-manage their health needs



# Success Factors

- Senior leadership
- Physician leadership with operations
- Quality support
- Engagement of the full continuum
- Data and analytics
- Visibility



**Focus on the patient**



# In Summary

- **Local Problem** - close the gaps in care to reduce readmission rates.
- **Design and Implementation** - The goal to reduce readmissions focused on a multifactorial approach which required people, process, integrated technologies, and eventually “big data” for risk stratification and predictive analytics
- **Healthcare IT** – Order forms and workflows within the EHR, virtual care, predictive models, data and analytics.

# In Summary - Outcomes

BECKER'S

## Clinical Leadership & Infection Control

### How Atrium Health sustains a 4% reduction in readmissions annually

Mackenzie Bean - Thursday, December 13th, 2018 [Print](#) | [Email](#)

 [SHARE](#)  [Share 0](#)

Charlotte, N.C.-based Atrium Health has seen significant improvements in readmission rates since implementing a new population health model, among other strategic initiatives, the hospital told *Becker's* via email.

As part of its efforts to reduce readmissions, Atrium Health launched a population health model called Transition Services in 2015. The model offers recently discharged patients access to an entire care team either at Atrium Health's transition clinic or in their own homes. The care team includes physicians, pharmacists, care manager nurses and social workers who are available to patients in the month after a discharge.

Atrium Health also relies on physician-led work groups, committees and its data analytics department to collaboratively identify the causes of unplanned readmissions and implement targeted interventions.

Since implementing these strategic initiatives, the health system has seen a 4 to 6 percent reduction in readmissions annually. Patients participating in Transition Services also demonstrated a 35 percent reduction in readmission rates compared to those receiving typical post-discharge care.

# In Summary - Outcomes

## KEY TAKEAWAYS

### Challenges

- Gaps in care between discharge and ambulatory care appointments resulted in readmissions, especially for medically complex patients

### Solutions

- One of Atrium Health's readmissions work groups lobbied for the implementation of a transition services clinic
- Patients at high risk for readmission are referred to an in-person or telemedicine clinic appointment, during which they are assessed by a pharmacist and physician and referred to a social worker who helps with social needs
- Providers and patient navigators utilize an opt-in approach and see patients quickly after discharge to ensure engagement



COST & QUALITY ACADEMY • FEBRUARY 2019 • FEATURE 1

## BEST PRACTICE SPOTLIGHT

Transition Services Clinic Can Address Social Determinants and Reduce Readmissions

### Results

- There was a 35% reduction in readmissions for patients who engaged with the transition services team

# In Summary - Outcomes

## DECREASING

### PATIENT READMISSION RATES



**Congestive Heart Failure Patients\***

\*From 2016 to 2017, the readmission rate for CHF patients at NHRMC dropped from 21.2% to 18.6%.



# In Summary - Outcomes

## LEVINE CANCER INSTITUTE



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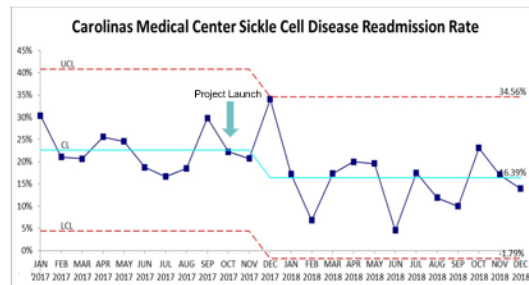
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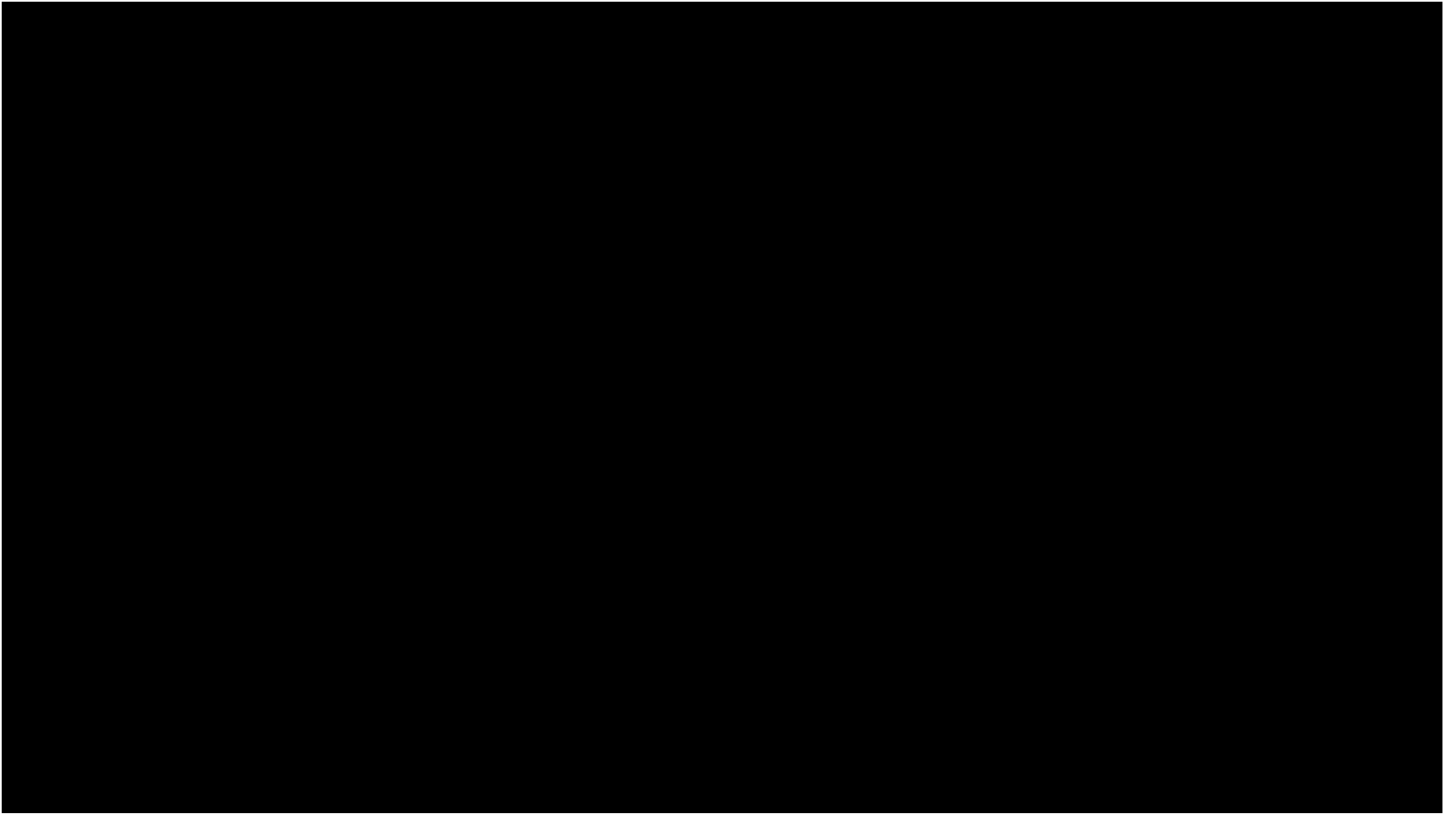
# Questions



**Atrium Health**

Addendum







# Roles & Responsibilities

## Workgroup Members

### • **Co-Chair: Clinical Ops Leader**

- Responsible and accountable for implementation of agreed upon interventions
- Assists in determining the feasibility of proposed interventions
- Identifies operational resources required to implement interventions
- Attends team meetings and actively engages in sub-committee work
- Seeks opportunities for synergy and collaboration with existing work

### **Chair: Physician Leader**

- Leads the group to achieve successful outcomes and attain established goals
- Champions the message to obtain buy-in & engagement from providers and other key leaders
- Attends team meetings and actively engages in sub-committee work
- Ensures all team members have input into efforts
- Seeks opportunities for synergy and collaboration with existing work

# Roles & Responsibilities

## Workgroup Members

### • **Quality Leader**

- Identifies opportunities and best practices in assigned area
- Incorporates identified opportunities into improvement work and leverages quality resources to support interventions
- Gathers and analyzes pertinent data
- Serves as key liaison between readmission sub-committees and other related initiatives across CHS
- Attends team meetings and actively engages in sub-committee work
- Seeks opportunities for synergy and
- collaboration with existing work
- Provides team facilitation (*may delegate facilitation support to a member of his/her team*)

### **Team Member**

- Attends team meetings and actively engages in sub-committee work
- Provides thought leadership as appropriate for his/her area of expertise
- Champions the message to obtain buy-in and gain support from peers
- As appropriate, provides support for implementation of interventions

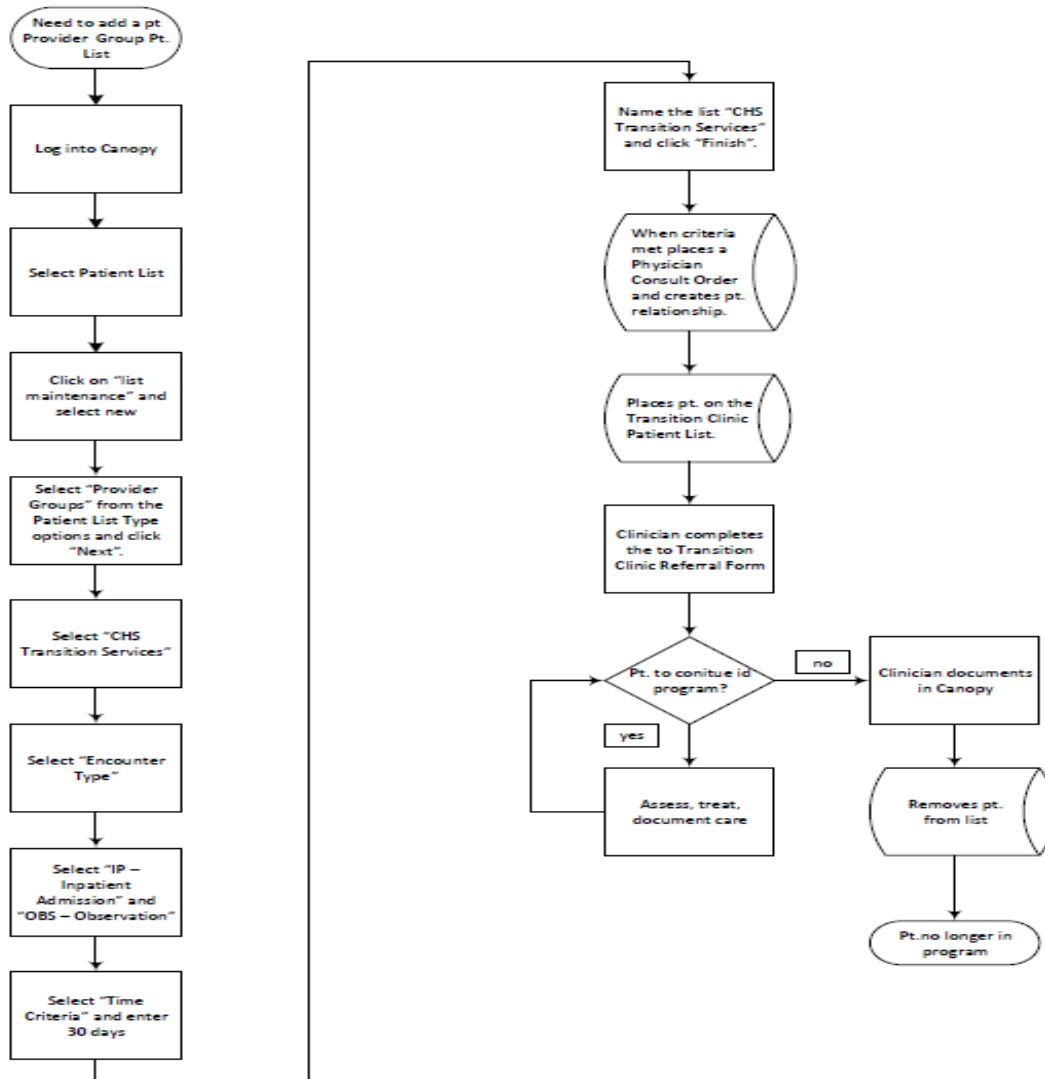
# Roles & Responsibilities

## Workgroup Members

### **Executive Committee Member**

- Assigned as Executive Sponsor to a workgroup
- Hold a quick, virtual, touch base call or meeting 2x/month with assigned workgroup
- To serve as the integration/coordination of clinical and operational input to strategic development and execution for CHS Readmissions work
- To serve as a repository of data and activity around readmissions work across the System
- To understand the variability and create standardization
- To set objectives for the 2015 and 2016 work
- To provide feedback and direction to the Strategy Team
- To provide overall oversight and issues resolution to ensure successful outcomes
- To provide guidance, education and communication to CHS leaders regarding Readmissions strategies
- To advocate for appropriate resources and ensure the work remains a priority focus
- To focus the organized work in the Metro region and share learnings as rapidly as possible and promulgate single unified enterprise thinking throughout the CHS clinical enterprise

# Transition of Care Workflow





# AIMING TO IMPROVE READMISSIONS THROUGH INTEGRATED HOSPITAL TRANSITIONS (AIRTIGHT): A PRAGMATIC RANDOMIZED CONTROLLED TRIAL

Andrew David McWilliams, MD, MPH<sup>1,2,3</sup> | Jason Roberge, PhD, MPH<sup>3</sup> | Whitney Rossman, MS<sup>3</sup> | Charity G Moore, PhD, MSPH<sup>4</sup> | Stephanie Murphy, DO<sup>1</sup> | Stephanie McCall<sup>1</sup> | Ryan Anthony Brown, MD<sup>1</sup> | Shannon Carpenter<sup>1</sup> | Scott Rissmiller, MD<sup>1</sup> | Scott Furney, MD<sup>2</sup>

<sup>1</sup>Carolinas Hospitalist Group, Atrium Health | <sup>2</sup>Department Internal Medicine, Atrium Health | <sup>3</sup>Center for Outcomes Research and Evaluation, Atrium Health | <sup>4</sup>University of Pittsburgh

## BACKGROUND

- Inpatient and observation readmission rates remain high and largely unchanged.<sup>1</sup>
- Hospitals have little, robust evidence to guide the selection of interventions effective at reducing 30-day readmissions in real-world settings.
- Most published studies in readmissions are limited by selecting engaged populations, being conducted only in academic settings, or using non-randomized designs.
- Our local healthcare system incorporated the most recent recommendations for preventing readmissions into a comprehensive program called Transition Services (TS) (Table 1).<sup>2</sup>

**STUDY OBJECTIVES:** To answer 3 questions important to hospital medicine providers and health system leaders:

- Can a hospital move a high-risk population's readmission metric by referring patients to a comprehensive transition clinic?
- Have we reached 'a floor' in readmission rates, despite resource intensive interventions?
- In a population free from selection bias, what is the actual rate of participation in a transitions intervention?

## METHODS

- Non-blinded, pragmatic randomized controlled trial (Clinicaltrials.gov: NCT02763202) conducted at two hospitals in Charlotte, North Carolina.<sup>2</sup>
- 1,876 adult patients, under the care of a hospitalist, at high-risk for readmissions, and discharged to home.
- Random allocation of referral to a Transition Services (TS) program (n=935) or usual care (n=941) (Table 2).
- Primary outcome: 30-day, unplanned, inpatient or observation readmission rate.
- Secondary outcomes: 30-day readmission rates for subgroups with congested heart failure, sepsis, and pneumonia; ICU stay on readmission.
- The primary analysis followed the Intention-to-treat (ITT) principle for all patients discharged to home (Figure 1).
- We secondarily performed per-protocol and Compensated Average Causal Effects (CACE) analyses to evaluate the effect of TS program participation.

## REFERENCES:

1. Zuckerman SB, Chalough SH, Crane L, Rohrer J, Spanish AM. Readmissions, Observation, and the Hospital Readmission Reduction Program. *N Engl J Med*. 2016;374(9):954-961. doi:10.1056/NEJMra1510084  
 2. Krippl S, Theobald CH, Ansell B, Vellwieser SC. Reducing hospital readmission rates: current strategies and future directions. *Ann Rev Med* 2014; 65:67-85.

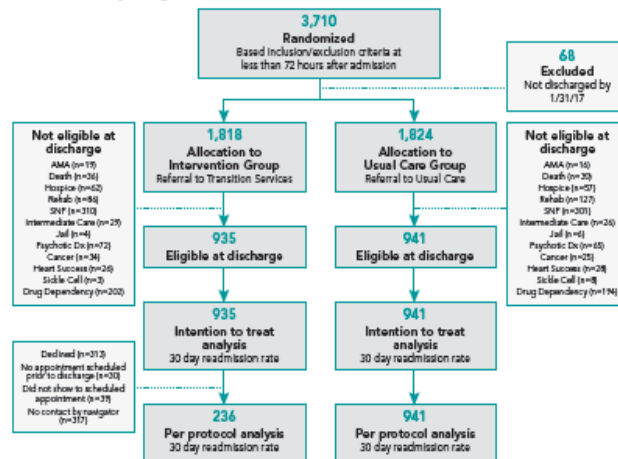
**TABLE 1: Transition Services' Program Components Aligned with Current Recommendations<sup>2</sup>**

TRANSITION SERVICES COMPONENT	CURRENT RECOMMENDATIONS
Referral to Transition Services Program and introduction by Patient Navigator, while patient still hospitalized	<ul style="list-style-type: none"> <li>Dedicated transition personnel</li> <li>Spanning inpatient and outpatient</li> <li>Engagement</li> <li>Discharge plan confirmation</li> </ul>
Comprehensive post-discharge evaluation by internal medicine physician	<ul style="list-style-type: none"> <li>Dedicated transition personnel</li> <li>Spanning inpatient and outpatient</li> <li>Access</li> <li>Timely follow-up of items outstanding at discharge</li> <li>Early identification of change in patient status</li> </ul>
Comprehensive post-discharge medication review by a pharmacist	<ul style="list-style-type: none"> <li>Dedicated transition personnel</li> <li>Medication errors, interactions, affordability</li> <li>misunderstanding, adherence</li> </ul>
In-home, virtual appointments	<ul style="list-style-type: none"> <li>Home-based interventions</li> <li>Integration of IT</li> <li>Access</li> </ul>
Availability of dedicated paramedics team for in-home visits	<ul style="list-style-type: none"> <li>Home-based interventions</li> <li>New types of transitional care personnel</li> <li>Dedicated transition personnel</li> <li>Access</li> <li>Coordinated service between home and clinic</li> </ul>
Multidisciplinary team (internal medicine, pharmacy, paramedic, behavioral health and care management providers)	<ul style="list-style-type: none"> <li>Dedicated transition personnel</li> <li>Access to comprehensive follow-up services</li> </ul>
Regular Health Advocate contact starting with discharge follow-up call and weekly thereafter	<ul style="list-style-type: none"> <li>Dedicated transition personnel</li> <li>Coordinated care</li> <li>Engagement</li> <li>Activation</li> </ul>
Real-time population health dashboards for clinic staff	<ul style="list-style-type: none"> <li>Integration of IT</li> </ul>
Coordinated transition to the next appropriate care location after 30 days	<ul style="list-style-type: none"> <li>Spanning inpatient and outpatient</li> <li>Coordinated care</li> <li>Inter-provider communication</li> </ul>

**TABLE 2: Baseline Characteristics\***

	TRANSITION SERVICES (n=935)	USUAL CARE (n=941)
Male, n (%)	457 (48.9)	442 (47.5)
Hispanic, n (%)	60 (6.4)	53 (5.6)
Race, n (%)	935	938
American Indian/Alaska Native	1 (0.1)	2 (0.2)
Asian	15 (1.6)	9 (1.0)
Black	346 (37.0)	373 (40.2)
White	463 (49.6)	481 (51.8)
Multi	2 (0.2)	2 (0.2)
Other	75 (8.1)	61 (6.6)
Age, mean (SD)	58.3 (17.7)	57.4 (17.4)
Comorbidities, n (%)		
Chronic Obstructive Pulmonary Disease	197 (21.1)	192 (20.5)
Congestive Heart Failure	225 (24.0)	216 (23.2)
Diabetes	359 (38.4)	363 (38.6)
End stage renal disease	112 (12.0)	107 (11.4)
Health Insurance, n (%)	935	938
Commercial/private	265 (28.3)	274 (29.2)
Medicaid	124 (13.3)	129 (13.8)
Medicare	376 (40.2)	405 (43.2)
Self-pay	102 (10.9)	95 (10.2)
Other	27 (2.9)	25 (2.7)

**FIGURE 1: Study Design and Patient Flow**



**TABLE 3: Primary and Secondary Outcomes (Intention to Treat)\***

	TRANSITION SERVICES (n=935)	USUAL CARE (n=941)	RR (95% CI) (p-value)
30-day all cause non-observative (CMS definition and inclusion of observation patients and any CHS facility)	142 (15.2)	153 (16.3)	0.93 (0.76-1.15) (p=0.52)
Inpatient**	124 (13.3)	128 (13.6)	0.98 (0.77-1.23) (p=0.83)
Observation**	21 (2.3)	33 (3.5)	0.64 (0.37-1.10) (p=0.10)
Length of stay—index admission, days, median (IQR)	4.0 (2.0)	3.0 (4.0)	p=0.14
Length of stay—initial readmission, days, median (IQR)	(n=142) 3.0 (4.0)	(n=153) 3.0 (4.0)	p=0.52
Intensive Care Unit stay on initial readmission	(n=142) 22 (15.5)	(n=153) 41 (26.8)	0.74 (0.59-0.93) (p=0.02)
30-day readmission rate among patients with a primary diagnosis of congestive heart failure	(n=41) 9 (22.0)	(n=48) 9 (18.8)	1.17 (0.51-2.67) (p=0.71)
30-day readmission rate among patients with a primary diagnosis of pneumonia	(n=33) 3 (9.1)	(n=24) 5 (20.8)	0.44 (0.12-1.65) (p=0.26)
30-day readmission rate among patients with a primary diagnosis of sepsis	(n=139) 11 (7.9)	(n=129) 21 (16.3)	0.49 (0.24-0.97) (p=0.03)

## RESULTS

**Intention to Treat Analysis (Table 3):**

- 30-day readmission rates were 15.2% in the TS group and 16.3% in the usual care group (RR 0.93; 95% CI, 0.76 to 1.15); P = 0.52).
- TS patients with a diagnosis of sepsis had lower 30-day readmission rates (RR 0.49; 95% CI, 0.24 to 0.97); P = 0.03).
- 30-day readmission rates were not different for those with congestive heart failure or pneumonia.
- Patients, who were referred to TS, and readmitted, had less ICU admissions 15.5% vs. 26.8% (RR 0.74; 95% CI, 0.59 to 0.93); P = 0.02).
- Among those referred to TS, 25.2% participated in the program.

**Per Protocol Analysis:**

- 30-day readmission rates were 10.6% in those participating in TS (n=236) versus 16.3% for usual care (n=941) (0.65; 95% CI, 0.44 to 0.97; P = 0.03).

**CACE Analysis:**

- A non-significant, absolute 4.0% reduction in 30-day readmission rates in the intervention participants compared to the usual care (-4.0; 95% CI, -17.0% to 9.1%; p=0.55).

## CONCLUSIONS

- Referral of a high-risk patient population to a transitions program did not lead to reductions in 30-day readmissions, but participation rates were low (25.2%).
- Pre-specified subgroup analyses showed decreased readmission rates for patients with sepsis and reduced ICU stays for the overall readmitted population.
- Per protocol analysis demonstrated a significant reduction in 30-day readmissions for those who participated in TS, but not in CACE analysis.
- Discrepancies in outcomes in the ITT vs. per protocol vs. CACE analyses highlight the need for population health innovations to be subjected to rigorous, pragmatic evaluation.
- Results provide RCT evidence highlighting the difficulty of moving a population-based metric within a complex healthcare environment.
- Improved patient outcomes are possible with transition programs, but additional innovative approaches are needed to achieve desired changes in population metrics.

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