

Predicting Risk of Readmissions for Targeting Patient Intervention

The PACT Program: Preventable Admissions Care
Team

*Engaging Patients To Understand and Reduce 30
Day Hospital Readmissions*

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Driving Forces Behind PACT: The Readmission Imperative

- There is a national mandate to prevent hospital readmissions. In 2009, CMS began publicly reporting 30 day readmission rates for patients hospitalized with heart failure, acute myocardial infarction and pneumonia. CMS will now adjust payments to hospitals according to their rate of excess readmissions.
 - Medicare FFS
 - Reduce 30 day Readmissions For CHF, AMI, PNE to achieve performance at or below national benchmarks
 - Begin assessment of conditions included as of FY 2015: COPD, CABG, PTCA and Other Vascular Conditions
 - Medicaid
 - In partnership with the NYS Partnership for Patients-Reduce the number of Potentially Preventable Readmissions (14 day and 30 day) by 20% over 3 years
- Hospitals with higher than average numbers of 30 day readmissions will suffer financial penalties.

The Mount Sinai Hospital

- **Our Hospital**

- Founded in 1852, one of the nation's oldest & largest voluntary not-for-profit hospitals
- Premier Tertiary-Care Facility
- Source of Major Advances in Medicine
- Affiliated with the Mount Sinai School of Medicine

- **Total Licensed Inpatient Beds:**

- Manhattan: 1,171
- Queens: 235

- **Ambulatory Clinic Visits:**

2011: 348,307

- **ED Visits:**

2011: 98,051

- **Inpatient Discharges**

2011: 58,080



- **Our Community**

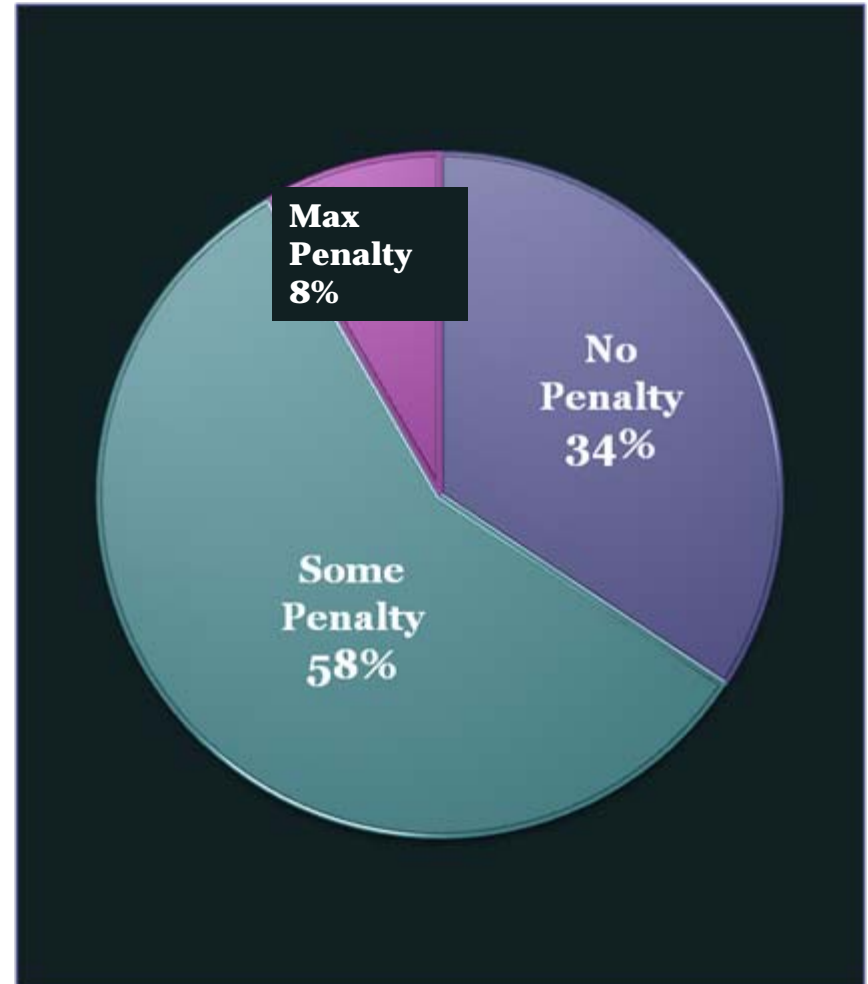
- Cultural, socio-economic, ethnic and religious diversity
- East Harlem
 - Lower than median household incomes
 - Documented health disparities exist among the predominantly Latino/Hispanic and African American populations
- Upper East Side
 - One of the nation's most affluent communities

Readmission Penalties

- Estimated 1% Penalty for Fiscal Year 2013 is approximately 2 million dollars
- Calculation of Excess Admissions dependent on National Performance
- Risk Adjustment Models do not address socioeconomic status, behavioral health or other psychosocial factors
- Penalties are progressive each year

Hospital Readmission Penalties

- Excess admissions measured for 3 conditions (AMI, Pneumonia and CHF).
- Penalties apply for a rolling 3 year period July 1, 2008 to June 30, 2011
- Maximum penalty
 - FY 2012 1% (278 hospitals)
 - FY 2013 2%
 - FY 2014 3%
- Penalties fall heaviest on hospitals in New York and New Jersey. NY and NJ ranked 49th and 50th Nationally.



New York City Area & Mount Sinai Penalties

Manhattan, NY	0.72%
Mount Sinai	.89%
Montefiore	1.00%
NY Presbyterian	.77%
North Shore	1.00%
Bellevue	1.00%*
New York Downtown	.81%
New York Hospital of Queens	1.00%
Lutheran**	.88%
Lenox Hill	.55%
NYU	.09%

Source: Medicare

*All HHC hospitals 1% except Harlem

** Majority of Brooklyn Hospitals had 1%

Medicare -The Readmission Imperative

- Nearly 20% of Medicare hospitalizations are followed by readmission within 30 days.
- 90% of rehospitalizations within 30 days appear to be unplanned, the result of clinical deterioration.
- MedPAC: 75% of readmissions preventable, adding \$12 Billion/yr to Medicare spending.
- Only half of the patients rehospitalized within 30 days had a physician visit before readmission.
 - Unknown if lack of physician visit causes readmissions— but poor continuity of care, especially for many chronically ill patients.
- 19% of Medicare discharges are followed by an adverse event within 30 days—2/3 are drug events, the kind most often judged "preventable."

Mount Sinai: The Readmission Imperative

- Medicare FFS penalties
- Management of populations and chronic diseases across the continuum
- Biggest driver is socio economic complexity exaggerated by inner city location
- Target our approach to address these issues

Benbassat J, Taragin M. Hospital Readmissions as a Measure of Quality of Health Care: Advantages and Limitations. *Arch Intern Med.* 2000;160(8):1074-1081

Kangovi S, Grande D. Hospital Readmissions—Not Just a Measure of Quality. *JAMA.* 2011;306(16):1796-1797. doi:10.1001/jama.2011.1562.888

Weissman JS, Stern RS, Epstein AM. The impact of patient socioeconomic status and other social factors on readmission: a prospective study in four Massachusetts hospitals. *Inquiry.* 1994 Summer;31(2):163-72.

Understanding Drivers of Readmissions

- **Managing Health – Avoiding Hospital Admission Reduces Readmissions**
 - Patient characteristics that lead to admissions also lead to readmissions.
 - Quality and practice patterns of nursing home, home health agency, and primary care drive both admission and readmission rates.
- **Certainties:**
 - You will not solve your readmission problem without understanding factors leading to admissions.
 - Reducing readmissions cannot be done within the walls of the hospital.
 - Must understand the big picture factors, while focusing on specific challenges and their solutions

Evidence Based Strategies for Preventing Readmissions

- Access to Good Primary Care
- Identifying High Risk Patients
- Systematic Interventions during Hospitalization
 - Interdisciplinary Rounds
 - “Adjusted” plan of care based on risk
 - Patient and Care Giver Education using “Teach Back” method
 - Medication Teaching
 - Plan of Care at Discharge
 - Medication Reconciliation
- Managing Transitions (hospital to home)
 - Post Discharge Phone Call
 - Communication with PCP and 7-10 day appointment
 - ***Transitional Care Coordination – 30 days post discharge***

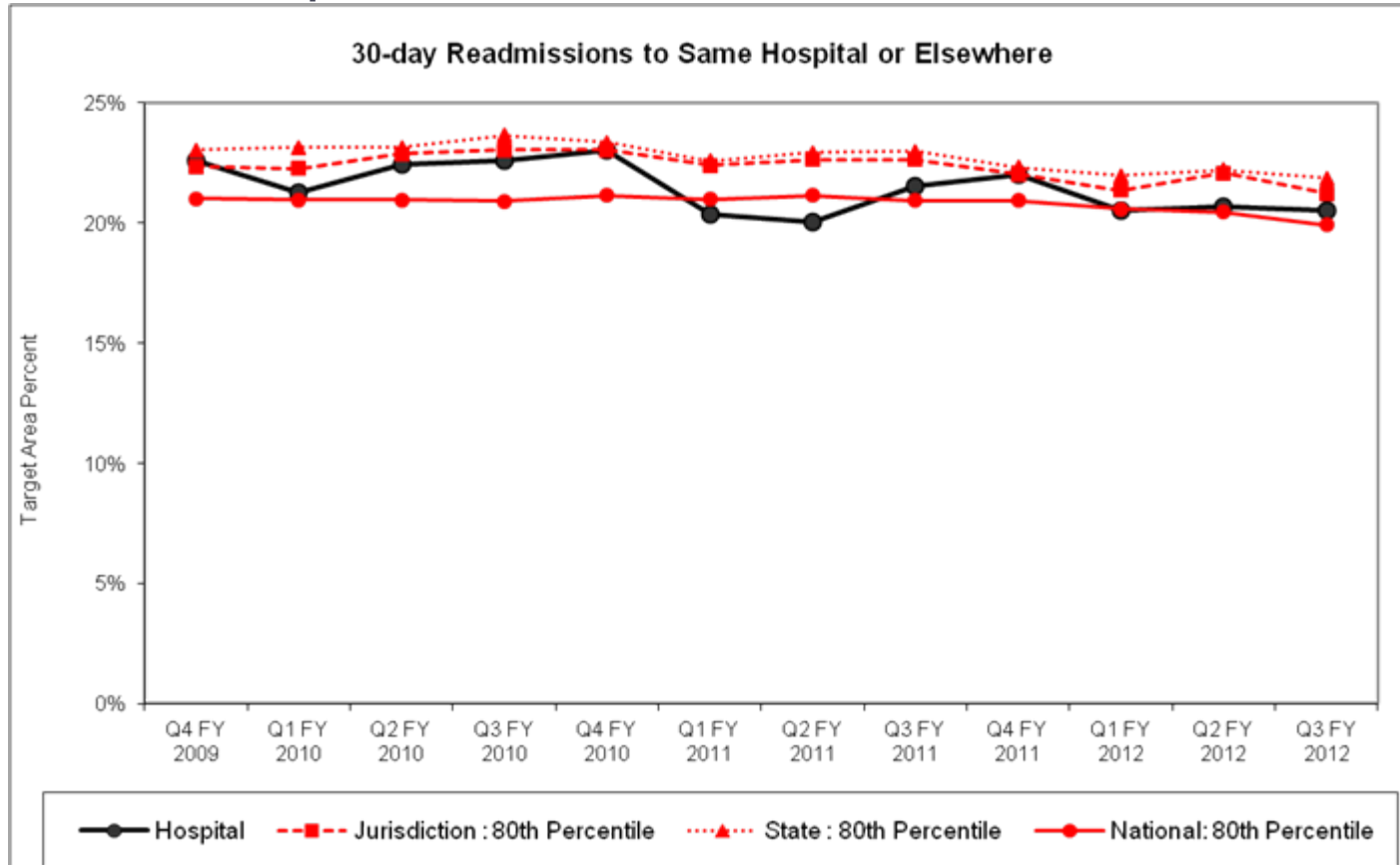
Readmission Initiatives Around the Country

- **RFP at the Federal level for transitional services**
(CCTP: Community-based Care Transitions Program)
- **Evidence-based models: Coleman & Naylor**
 - Combination of calls and visits to address barriers to self-management of illness in the medical domain (i.e. medications, follow-up visits, recognition and responsiveness to new symptoms; keeping track of medical paperwork).
 - Necessary but insufficient for our patients with extreme psychosocial complexity, and not tailored to patients at the highest risk of readmission.
 - PACT goes beyond by addressing each patient's unique the psychosocial drivers of readmission

Mount Sinai Patients/East Harlem Patients

- What issues are pertinent to Mount Sinai and East Harlem patients?
 - Multiple chronic co-morbidities
 - Prevalence of behavioral health issues and substance abuse
 - Fragmented health care delivery and trust in the health care system
 - Housing
 - Availability of healthy foods
- What services are needed?
 - Bilingual/Bicultural staff – social workers, physicians, nurses
 - *“Primary Language: English” doesn’t always mean “English speaking at level necessary for effective communication”*
 - Provision of consistent primary care & coordination of care for patients who are medically and psychosocially complex
 - Education regarding specific chronic illnesses (e.g. diabetes, asthma, etc.) for those with low health literacy and low literacy

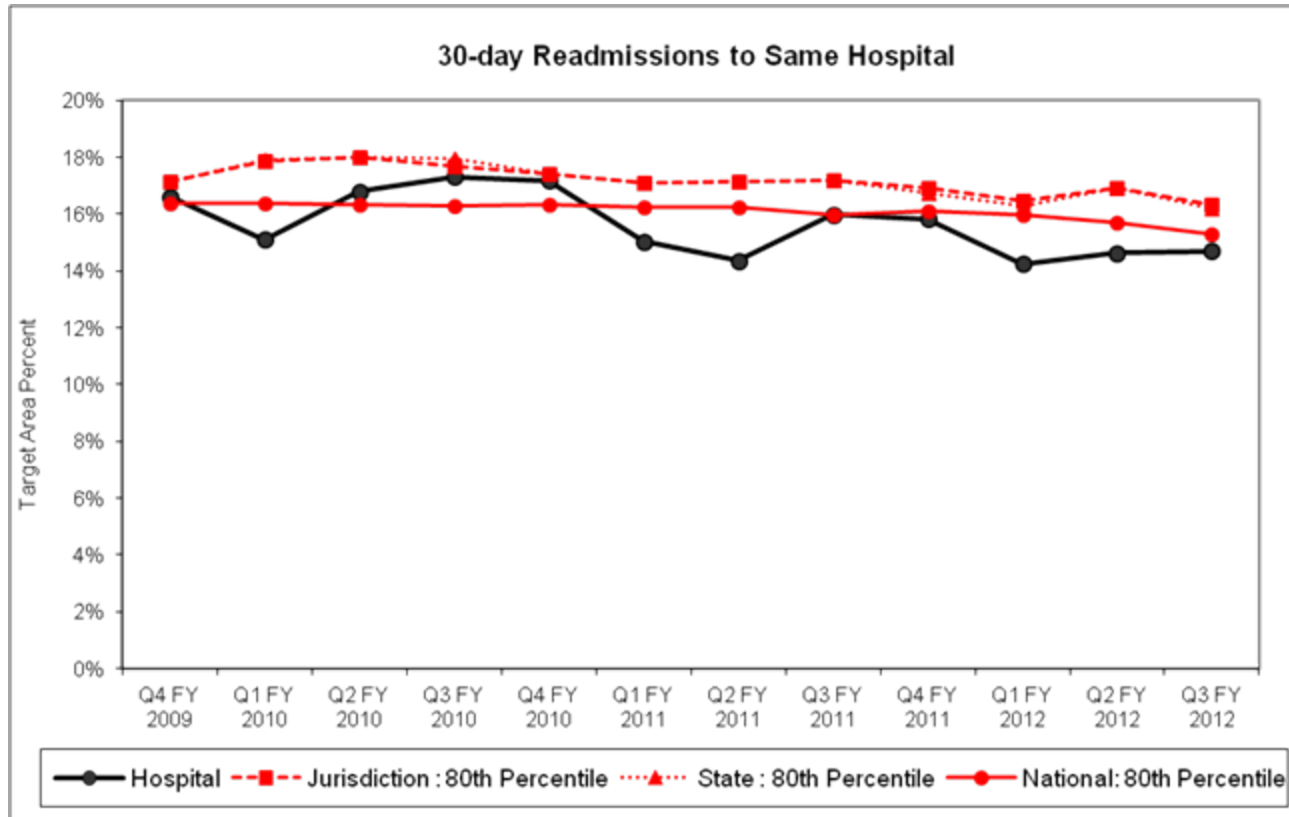
Medicare Fee for Service Readmissions to Same Hospital or Elsewhere



Time Periods	Percent (Numerator / Denominator)	Jurisdiction on 80th Percentile	State 80th Percentile	National 80th Percentile
Q4 FY 2011	22.0%	22.0%	22.3%	20.9%
Q1 FY 2012	20.5%	21.4%	22.0%	20.6%
Q2 FY 2012	20.7%	22.1%	22.2%	20.5%
Q3 FY 2012	20.5%	21.2%	21.9%	19.9%

Source: CMS PEPPER Report

Medicare Fee for Service Readmissions to Same Hospital

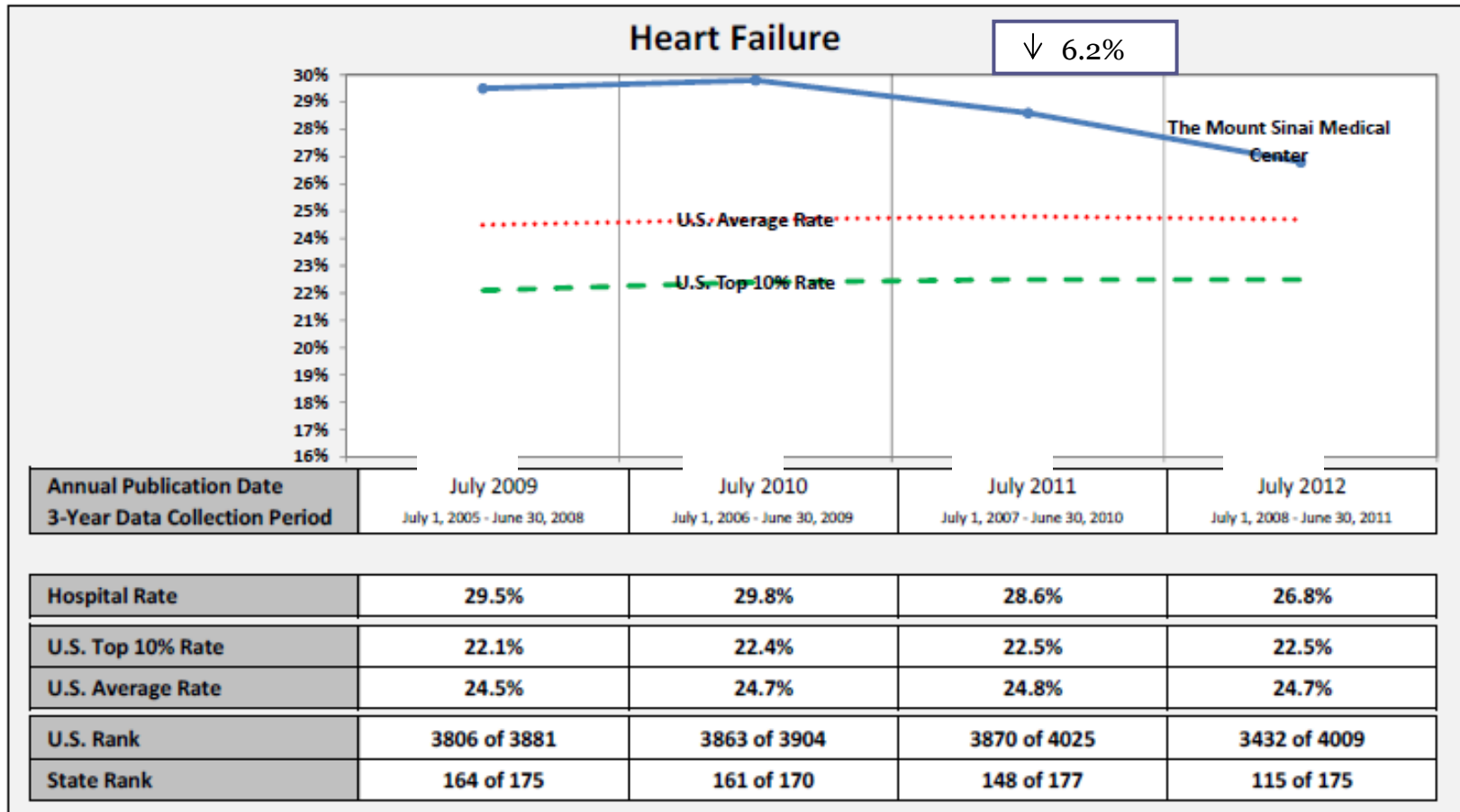


	Percent (Numerator / Denominator)	Jurisdiction 80th Percentile	State 80th Percentile	National 80th Percentile
Q4 FY 2011	15.8%	16.9%	16.8%	16.1%
Q1 FY 2012	14.2%	16.5%	16.3%	16.0%
Q2 FY 2012	14.6%	16.9%	16.9%	15.7%
Q3 FY 2012	14.7%	16.4%	16.2%	15.3%

Source: CMS PEPPER Report

Medicare FFS Patients Readmissions to Any Hospital: Heart Failure

Percentiles based on a rolling 3 year average



Source: HANYS

The Readmission Imperative: Identifying Patients at Risk

- Predicting and identifying which patients are at greatest risk of readmission is challenging to health systems. There is need to target high risk patients for care transition interventions.
- Current risk/predictive models can be challenging and utilize data that may not be readily available in real time in all hospitals.
- Hospitalization history alone to target patients for transitional care has historic significance at Mount Sinai and is easily available.
- We have validated this approach with more formal risk models based on factors that characterize patients through demographics and co-morbidities.

Mount Sinai Medical Center Stratified Approach to Reducing Readmissions

Objective: Reduce 30-Day Readmissions of All Adult Patients

IMPROVED TRANSITION PROCESSES

For All Patients

Enhanced RN Discharge Phone Calls
Discharge Instructions with Medication Reconciliation
Improved Processes for 7-10 day Post-Discharge Appointment
IT Real-time In-Hospital Alert for High-Risk Patients

INTENSIFIED DISEASE MANAGEMENT AND PLAN OF CARE

For Patients at Risk of Readmission Heart Failure, COPD, Diabetes, ESRD

Tailored Home Care Options, VNSNY NP Program, PACE, IMA Heart

TRANSITIONAL CARE

ENHANCED POST-DISCHARGE INTERVENTION For Patients at Highest Risk of Readmission (2+ readmission/6mo)

PACT

In-Hospital Identification & Assessment
5-Week Post-Discharge Care Coordination
Identification of PACT patients with fragmented primary care and linkage to IMA PACT Clinic (25% of PACT patients)

Primary Care Provider

Coffey Practice

FPA

IMA

IMA PACT CLINIC

MSMC Voluntary Physician

Non-MSMC Physician

SNF /Hospice

Transplant

Visiting Doctors

Overview of PACT

- **PACT** Preventable Admissions Care Team
 - Transparent short-hand to the program's purpose and model of care
 - Identifies, for each patient, the issues driving readmissions and behaviors patient is willing to change
 - Social Work driven model
- **PACT Intervention**
 - Unique Transitional model that identifies readmission drivers at the patient level
 - 75- minute enhanced assessment (patient and care giver)
 - 35 day post-discharge transitional services for high risk patients
- **IMA PACT Clinic** (an enhanced medical home)
 - NP-staffed clinic for high risk patients
 - PACT Social Worker
- **Implementation**
 - Sept 2010 – PACT Transitional Services
 - November 2010 - IMA PACT Clinic
 - October 2011- PACT Volunteer Partners Pilot

Transitional Care: PACT & C-PACT Model

Identification of PACT Patients

Daily High Risk Report (HCC score + MSH admissions history)

Nursing Assessment Questions (Readmission history outside of MSH)

Direct provider referrals

Pre-assessment consultation with PCP/Attending/ NP/Resident re prognosis

Inpatient Effort

Comprehensive psychosocial bedside assessment (with patient/family) to identify:

- Drivers of readmission
- Patient's current understanding of illness, prognosis and self-management strategies
- Patient's degree of motivation to change behavior and to collaborate with PACT

Assignment to HIGH or MODERATE Intervention

Collaboration with unit staff, primary care provider, and family

Five-Week Post-Discharge Care Coordination

Activation of patient: (HIGH INTERVENTION) 21 phone calls + 3 accompaniments (MODERATE INTERVENTION) 9 phone calls + 1 accompaniment to address unique drivers of readmission

Reinforce or establish continuity of care with referral to FPA, Coffey, Visiting Doctors, IMA, IMA PACT Clinic, Institute and/or other medical providers

Facilitate communication between patient and PCP/specialists around new symptoms and changes in plan of care

Collaborate with ACO; GEDIWISE; HEALTH HOME to avoid duplication of services

Primary Care IMA PACT Clinic

Enhanced medical home

- Same providers at each visit
- On-going assessment & intervention around new psychosocial barriers to self-management of illness
- Not a transition clinic: patients are seen regularly until Visiting Doctors or hospice becomes appropriate or until patient expires

Open access model

- No restrictions at time of appointment or first visit
- Enhanced telephone communication model (5-PACT)
 - AMAC Priority
 - Email notification to NP/SW for all calls
- Rapid response to phone calls by IMA PACT Clinic providers
- Same day appointments as needed
- Home visits as needed

PACT and the Community

- What services and influences outside the hospital influence the ability to change readmission rates?



PACT Patient Profile	PACT GRADUATES
Number of Patients	834
AGE <i>65+</i> <i>85+</i>	Range: 19-99 58% 12%
GENDER Female Male	53% 47%
RACE African American Hispanic Caucasian Other	38% 16% 26% 20%
ZIP Manhattan above 96 street Other Manhattan Other Borough	57% 7% 36%
CHF Primary or Secondary CHF + 2 or > additional diagnoses	27% 70%
Diabetes	39%
Dialysis	26%
Mental illness diagnosis documented	17%
Payor Mix FFS Medicare FFS Medicaid Managed Medicare Managed Medicaid Other Commercial Self-Pay	(18% of PACT patients are dual eligibles) 60% 9% 12% 11% 7% 1%
Caregiver Family None Friend/Paid	84% 14% 2%

PACT OUTCOMES

58% Reduction in 30 day Readmission rates

- Baseline 39% reduced to 16%
- Sustained gains at 60 and 90 days

Readmissions Rates @ 30, 60, 90 days

Days from Index Admission*	Total Patients	Patient with Hospitalizations	%
30	843	132	16%*
60	709	186	26%
90	649	218	33%

* Index Admission = PACT enrollment admission (discharge date)

PACT OUTCOMES

Improved Hospital Utilization

- Reduction in Hospitalization and ED Visits
- Improved access to primary care

Patients Who Completed PACT 5-Week Intervention*

	Pre	Post	Reduction
Admissions**	988	608	38%
ED Visits	1864	908	51%
Appointments Made within 7-10 days			91%
Show Rate			84%

* All patients are their own controls. The “Pre” time period has been adjusted to match the “Post” period on a per patient basis. For days “Post” [discharge from index admission] mean: 321 days; max 617 days; median 337 days

**Excludes index admission

The Impact of PACT

- We are delivering higher quality care at a reduced cost to Medicare

1 typical PACT patient	12 months pre PACT enrollment	12 months post PACT enrollment
ED & inpatient visits	20	7
Cost to Medicare	\$140,000	\$54,000

- **Medical:**
 - Collaborative partnerships with specialty groups for education– Diabetes, Pulmonary , Dialysis - enhances care for patients who need it most
- **Programmatic:**
 - PACT harnesses the expertise at Mount Sinai by being a source of referral for multiple initiatives – Home Care, Palliative Care, Geriatrics, Visiting Doctors
 - Creation of the PACT Volunteer Partners Program to extend benefits to more patients and create tiered assessments and interventions

The Impact of PACT at the Patient Level

- *How would a patient see the effects of this initiative?*
- Patients feel better emotionally – they have an ally on the inside. They have an advocate.
 - *“Y’all have taken such good care of me, I feel like I should take care of me.”*
- They feel better physically (i.e. improved health outcomes)–
 - *“I’m going to need your help in renewing my parking permit because I’m ready to start driving again and getting out there.”*
- We are delivering higher quality care at a reduced cost to Medicare...

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- Current risk/predictive models can be challenging and utilize data that may not be readily available in real time in all hospitals.
- Hospitalization history alone to target patients for transitional care has historic significance at Mount Sinai and is easily available.
- We have validated this approach with more formal risk models based on factors that characterize patients through demographics and co-morbidities.

Predictive Modeling

- Using logistic regression, our health policy group developed a risk prediction model for readmission within 30-days.
- The model, which used patient demographics and relevant co-morbidities was developed in a cohort of hospitalized Medicare FFS beneficiaries with a high proportion of cardiovascular disease.
- The higher the risk score, the higher the risk of readmission
- Scores of 0-2 had a 7% risk of readmission, whereas scores of 3 or 4 and above 5 had 30-day readmission rates of 19% and 29% respectively.
- We applied this risk scoring model to patients enrolled in the PACT program, who had been identified solely by hospitalization history. The objective was to determine if the PACT patients would have been identified as high risk of readmission based on the regression model

Readmission Risk Stratification

Medicare FFS Patients Discharged From Mount Sinai in 2010

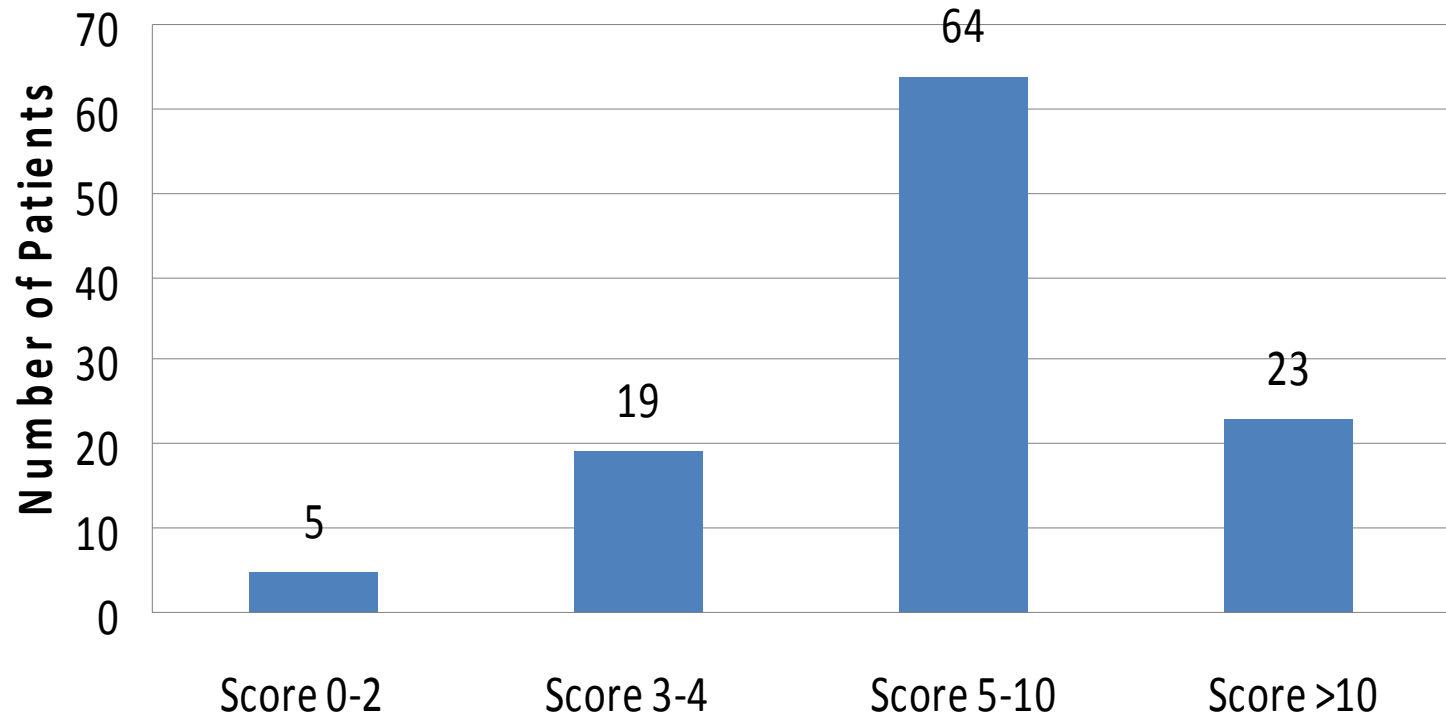
Condition or Characteristic	Coefficient	Odds Ratio	95% CL for OR		Risk Score
chronic kidney disease	0.3869	1.5	1.199	1.809	2
HF	0.2569	1.3	1.058	1.580	1
Osteoporosis	0.3374	1.4	1.040	1.888	1
COPD	0.6851	2.0	1.485	2.651	3
Depression	0.5553	1.7	1.277	2.377	2
Stroke	0.9292	2.5	1.590	4.035	4
AMI	0.8912	2.4	1.639	3.628	3
HIP Fracture	1.055	2.9	1.306	6.316	4
Alcohol Abuse	0.7603	2.1	1.100	4.160	3
Breast Ca	0.8597	2.4	1.124	4.967	3
Dual Eligible	0.279	1.3	1.104	1.583	1
Black	0.4201	1.5	1.228	1.887	2
Hispanic	0.2914	1.3	1.078	1.661	1
CKD & AFIB	1.1159	3.052	1.756	5.305	4
CKD (<65 yrs)	0.5437	1.722	1.220	2.431	2

Score	Patients at Each Score	Patients/Group	Avg Risk/Group	Blended Risk
2	1717	2883	20.6%	29.2%
3	1166			
4	809	2509	39.0%	
5	572			
6	535			
7	281			
8	146			
9	67			
10	56			
11	21			
12	17			
13	3			
14	2			

Risk Assessment of PACT Patients

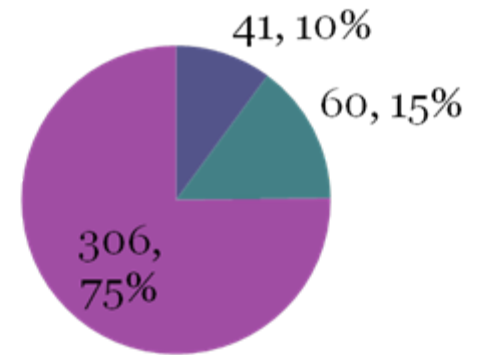
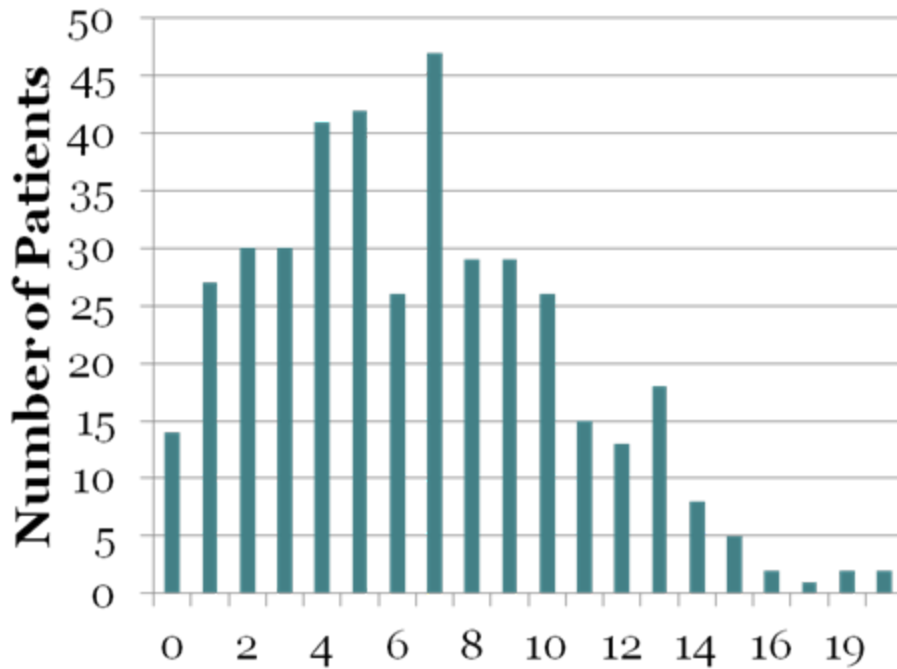
- **A total of 393 patients were enrolled in PACT in a year and completed the 5 week intervention**
 - **Eighty percent of PACT enrollees had 1 cardiac co morbid illness (76% ischemic heart disease, 66% CHF, and 17% atrial fibrillation).**
 - **Prior readmission data was available through 2010 and thus, the analysis was completed for 111 patients**
- ***Ninety-five percent of PACT enrollees had a risk score greater than 3: 19 patients (17.1%) had a risk score of 3-4, and 87 patients (78.4%) had a risk score of 5 or greater.***

Distribution of PACT Patients by Risk Score



Distribution patients enrolled in PACT by 30-day readmission score

All PACT patients

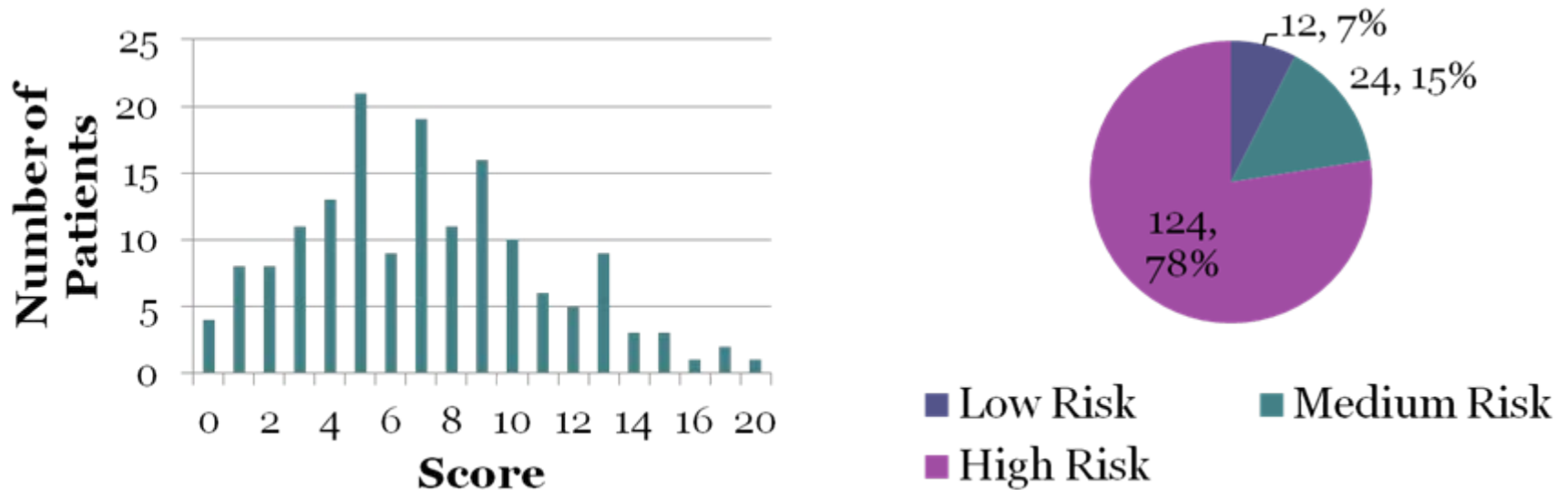


■ Low Risk ■ Medium Risk
■ High Risk

	Low Risk	Medium Risk	High Risk
Score	0-1	2-3	4+
# Patients	41	60	306
% of Total	10%	15%	75%

Distribution patients enrolled in PACT by 30-day readmission score

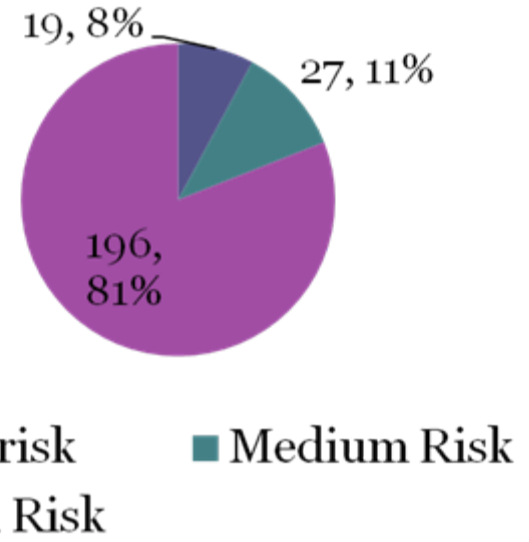
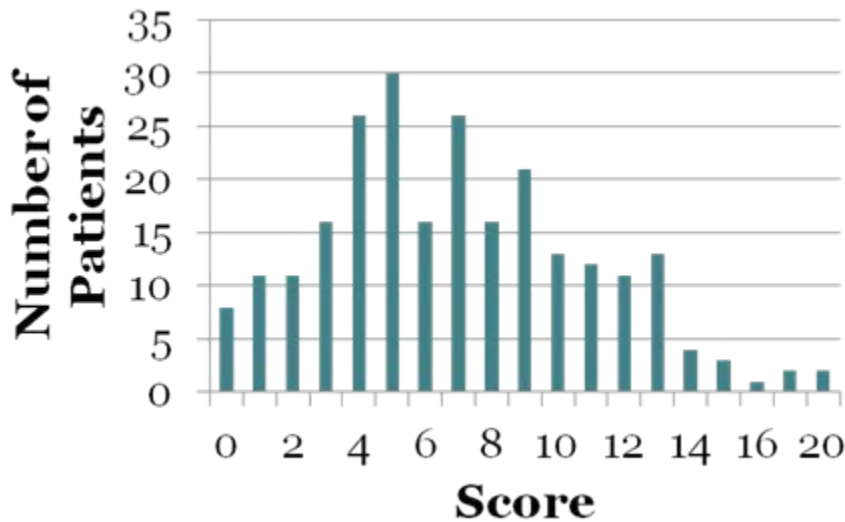
Medicare FFS patients



	Low Risk	Medium Risk	High Risk
Score	0-1	2-3	4+
# Patients	12	24	124
% of Total	8%	15%	78%

Distribution patients enrolled in PACT by 30-day readmission score

Medicare FFS and Managed care patients




	Low Risk	Medium Risk	High Risk
Score	0-1	2-3	4+
# Patients	19	27	196
% of Total	8%	11%	81%

Identification of High Risk Patients

- Success of ACO, CCTP, CMMI initiatives depends on identifying the most appropriate patients upon which to intervene
- Literature supported predictors
 - History of hospitalization
 - Medical complexity: number of co-morbid conditions
- Methods
 - Department of Health Evidence and Policy developed a modified HCC Score
 - Readmission-related question added to Nursing Assessment
- Visibility to Care Team
 - Risk Level (high/moderate) and “Program” visible in EPIC Headers and Patient Rosters

Making Risk Visible

Inpatient Header

); None	BMI, IBW: --, --	Allergies: Not on File	Infection: None	PCP: None
D): --	Problem: (None Found)	Code Status: None	FYI's: None	
viD): --	Readmit Risk: No, High-ACO	Isolation: None	Attend Prov: KANNRY, J	Program: ACO

Ambulatory Header

Current PCP: KANNRY, JOSEPH ...	MyChart: Inactive	FYI: None	Alert: Health Maintenance	Weight: None	Readmit Risk: --, High-HCC, High-RN Doc
Insurance: AETNA PLAN 1 VEMR				Isolation: None	Program: ACO, --, -- 

Lessons Learned and CCTP Readiness

- **Administrative:**

- Reduced admissions for the hospitals beyond 30 days
- Reduced ED visits
- Leverage success to fuel other options under Affordable Care Act (ACO and CMMI funded projects)
- Integrated into EMR

- **Clinical:**

- Collaborative partnerships with specialty groups – Diabetes, Pulmonary, Dialysis - enhances care for patients who need it most
- Enhanced Primary Care – PACT Clinic and Institute
- Expanded community partnerships
- Improved communication and handoffs

- **Programmatic:**

- PACT harnesses the expertise at Mount Sinai by being a source of referral for multiple initiatives – Tailored homecare options, IMA Heart, Palliative Care, Coffey Geriatrics, Visiting Doctors
- Creation and flourishing of the Mount Sinai Auxiliary Board funded PACT Volunteer Partners Program
 - Functions as extenders for Social Workers, improving productivity

CCTP Award



- MSH, MSHQ and Institute for Family Health (Institute) awarded transitional care contract from Medicare based on PACT Model
- Initiative: **C-PACT (Community Based Preventable Admissions Care Team)**
- 4813 Medicare FFS patients to be served annually
- Expanded primary care services for high risk patients (PACT Clinic and Institute)
- Tiered intervention: Patient assignment based on modified HCC score:
 - 2-3 → Moderate
 - 4+ → High
- Patients enrolled beginning October 2012

The Institute for Family Health

- A federally-qualified community health center (FQHC) network
- Founded in 1983, one of the largest community health center networks in New York State
- Provides high quality health care to low-income, medically underserved communities
- Serves over 85,000 patients annually at 26 locations. Over 400,000 visits annually
- Level 3 Medical Home with nationally recognized expertise in delivering primary care
- Leader in family medicine training
- Provides integrated, multidisciplinary, coordinated care to patients with Mental Illness, HIV, Diabetes and Other Chronic Diseases
- Extensive Community Network
- Leader in Health Information Technology
- Center of Excellence in the Elimination of Disparities

The Institute for Family Health

Benefits to Institute

- New patients
- Opportunity to build relationship with medical center
- Increased continuity of care for all of our patients

Results

- New Institute-led Department of Family Medicine and Community Health
- More primary care training for residents and students
- Better collaboration on patient care

Conclusions and Future Directions

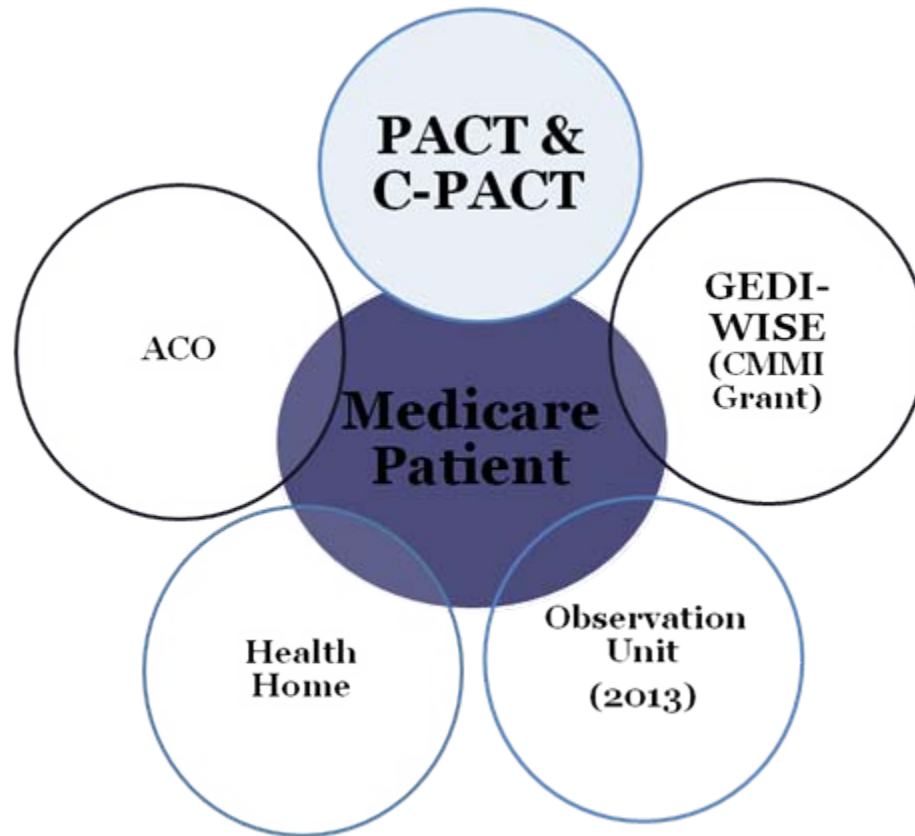
- **PACT is activating and engaging the most challenging patients and is successful in the mission of reducing 30, 60, 90 day readmissions and health care utilization. Issues that drive readmissions and hospitalizations are not 30-day problems**
- **PACT patients represent a diversity of age, gender and ethnicity, enriched in cardiovascular disease and diabetes.**
- **PACT includes non-English speaking patients, and those with cognitive impairment and mental illness which other transitional programs have excluded.**
- **PACT is sustainable, replicable, and improving quality of care.**
- **PACT is a robust collaborative effort that is penetrating into all arenas of the medical center and is changing the way we care for patients.**

Conclusions and Future Directions

- **Hospitalization history alone, as we have characterized it here, is a reasonable proxy to more formal multivariable regression models in predicting risk of 30-day readmissions**
- **Hospitalization history is readily available in most institutions. If substantiated through further study, this could have national implications for real time high risk patient identification for transitional services.**
- **Mount Sinai's Risk Score, developed by Health Policy, utilizes comorbidities and demographics that are available in real time**
- **Hospitalization history and risk score together may hold great strength in identifying our highest risk patients for interventions to reduce readmissions**

Transformational Change

- Patient Engagement**
- Primary Care**
- Transitional Care**
- Chronic Disease Management**
- Long Term Care Coordination**
- Community Partnerships**
- Enhanced Information Technology**
- Population Management tools**



Proactive Management of the Patient

Why PACT is Successful

- **Engagement**
 - The most difficult patients
 - Sinai Community
 - Community Partnerships
- **Empowerment**
 - Health Care Providers/ Care Team
 - Patients
 - Families
- **Sustained Gains**
 - For patients
 - For the hospital
 - For the ACO
- **Applied learning**
 - Social Work driven model
 - Mission-driven staff
 - Evolving Models of Health Care Delivery and integration