



Predictive Risk Stratification: Using Analytics to Empower Change

Melissa Welch, MD, MPH



Agenda

- Introduction
- The Care Team Burnout Challenges
- Risk Stratification Best Practices and Models
- High-Value Data Inputs
- Measuring Outcomes
- Review and Questions

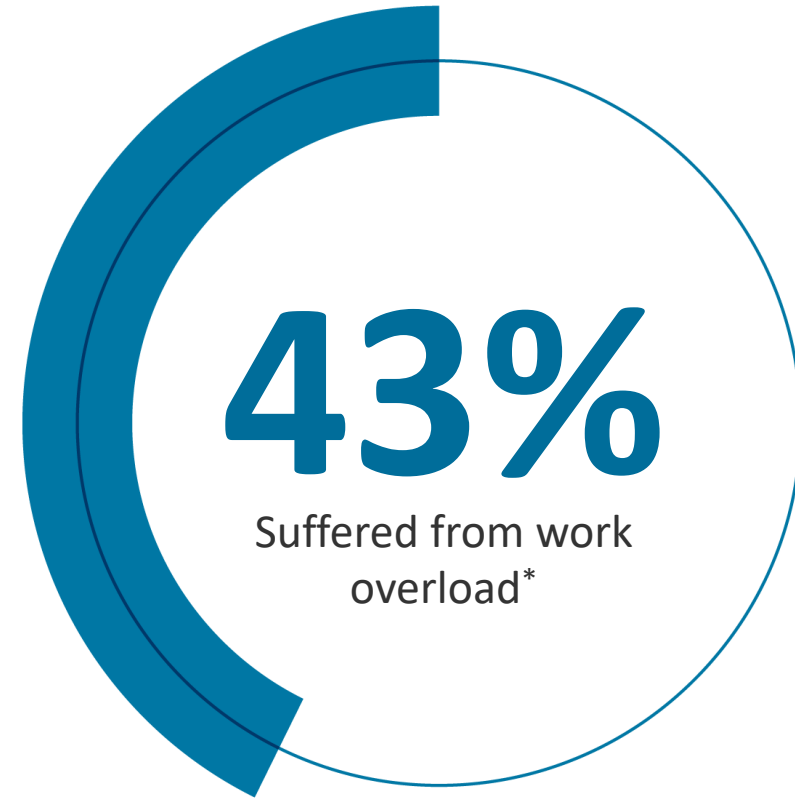
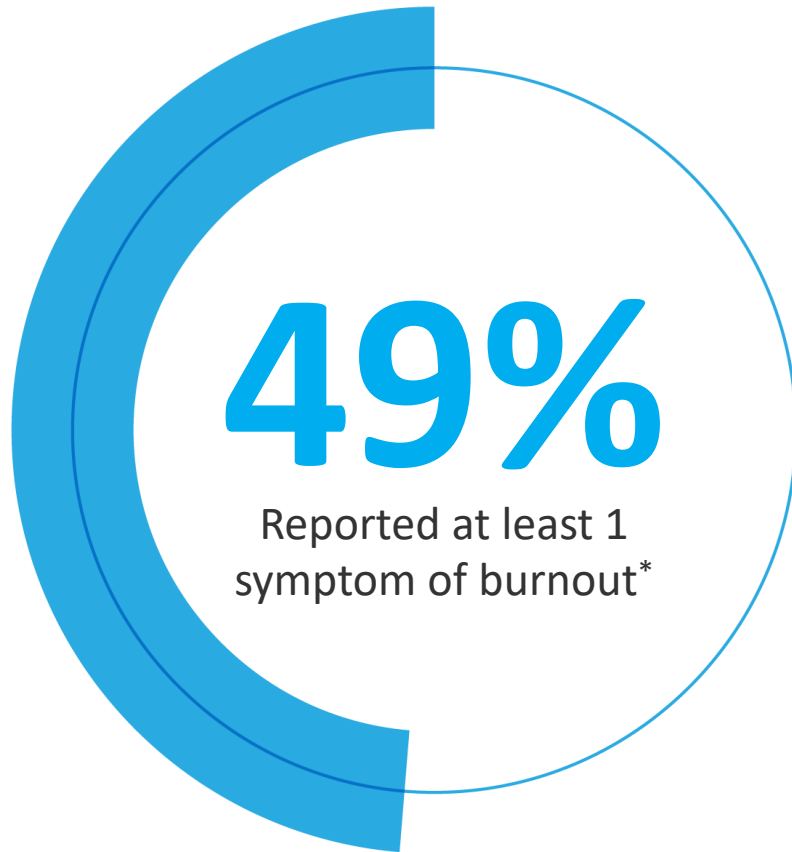
Melissa Welch, MD, MPH

Chief Medical Officer, Health Catalyst



- Physician executive with 35 years of leadership, management, and healthcare strategic impacts
- Private and public healthcare sectors, academic, and community
- Successfully built physician and allied clinical teams, stabilized quality and operations, and executed critical value-based care results
- Prior tenures: InnovAge PACE, Blue Shield of California, United Healthcare, Aetna, and San Francisco's Community Health Network
- Board Certified in Primary Care, Internal Medicine; MPH, Epidemiology

Healthcare Professional Burnout



**AMA survey of ~21,000 healthcare professionals*

Cost of Healthcare Professional Burnout

Steep and still rising

The costs of clinician burnout are steep; a 2019 study estimated that physician burnout costs the US healthcare industry \$4.6 billion annually, mostly through clinician turnover and a reduction of clinical hours.¹

~20% of healthcare workers have quit, and 4 out of 5 of those who remain say staff shortages have affected their ability to work safely and satisfy patient needs.²

Approximately 85% of older adults have at least 1 chronic condition, and 60% have at least 2 chronic conditions.³

U.S. healthcare costs currently exceed 17% of GDP and continue to rise.⁴

An aging population and the associated increasing numbers of people with chronic conditions are placing unprecedented demands on health and social care services, both nationally and internationally.⁵

1. Blanding M. The economic cost of physician burnout. Harvard Business School. September 25, 2019.

Accessed December 9, 2021. <https://hbs.me/3IQISOa>

2. [webinar](#) hosted by U.S. News & World Report

3. Center for Disease Control

4. Harvard Business Review

5. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3776003/>



Impact of Predictive Risk-Stratification on Workload

Reduced workloads, targeted interventions, and empowered change

Separating patient populations into high risk, low risk, and rising risk allows care teams to

1. Identify patients who are most likely to benefit from specific care management programs
2. Increase patient engagement and outreach for low- or high-touch care management programs
3. Create effective and automated targeted interventions and improve work efficiency

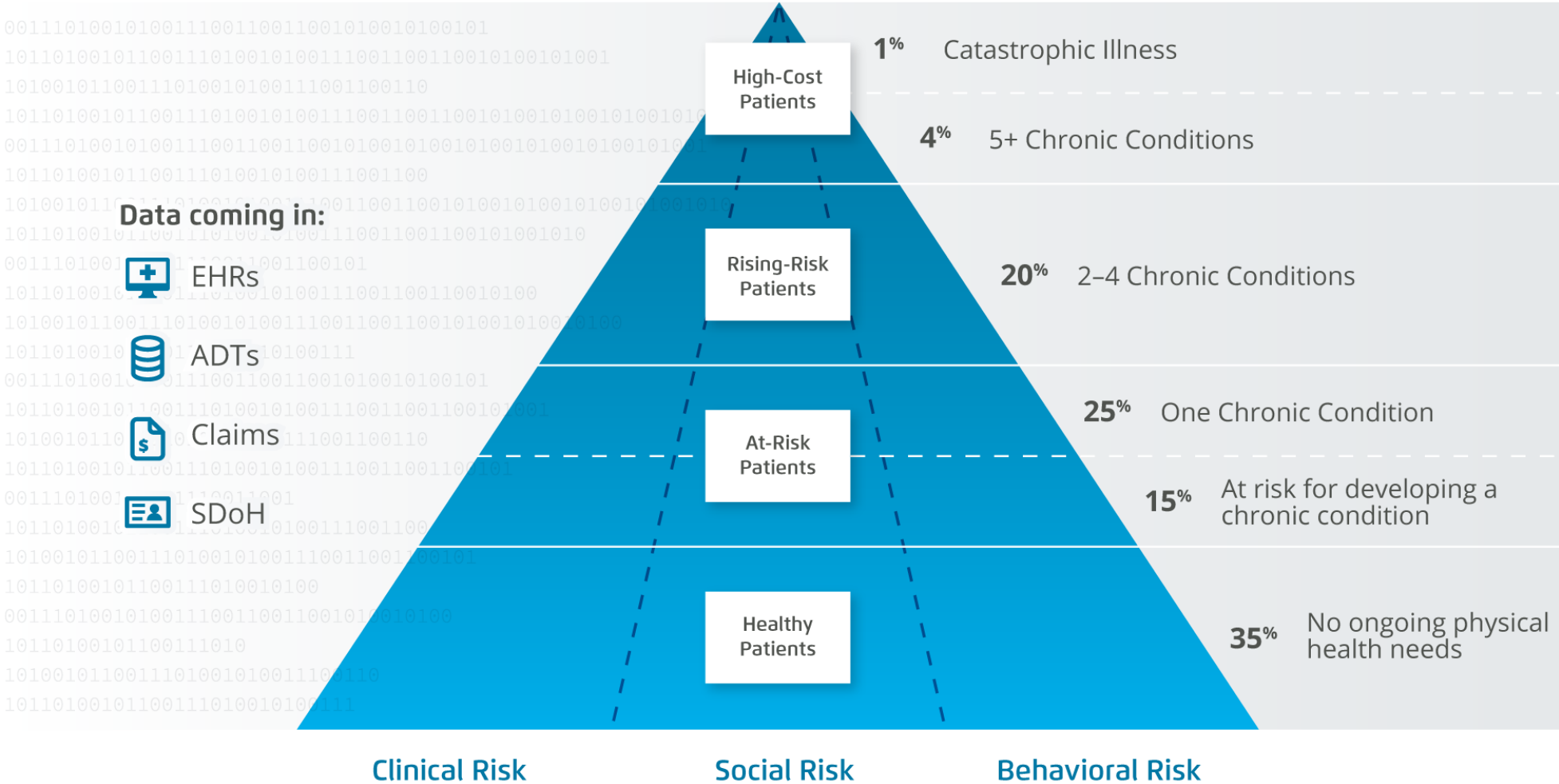


How do you *accurately*
identify patients who are at
high risk or have a *rising risk*
for *poor outcomes*?

Then what is the
appropriate *targeted*
intervention?

Rising-Risk and High-Cost High Needs

Why stratification is so important



Reduce Inpatient Spend with Risk Stratification

Understand *What* and *How* to Improve

Top Value-based Care Metrics

- ✓ Improved Contractual Performance
- ✓ Reduce Out-of-Network Leakage
- ✓ Reduced PMPM
- ✓ **Reduced Readmissions**
- ✓ Improve Quality
- ✓ Improve Preventative Care and Wellness
- ✓ Reduce Inappropriate Utilization



What should I do differently and *how*?

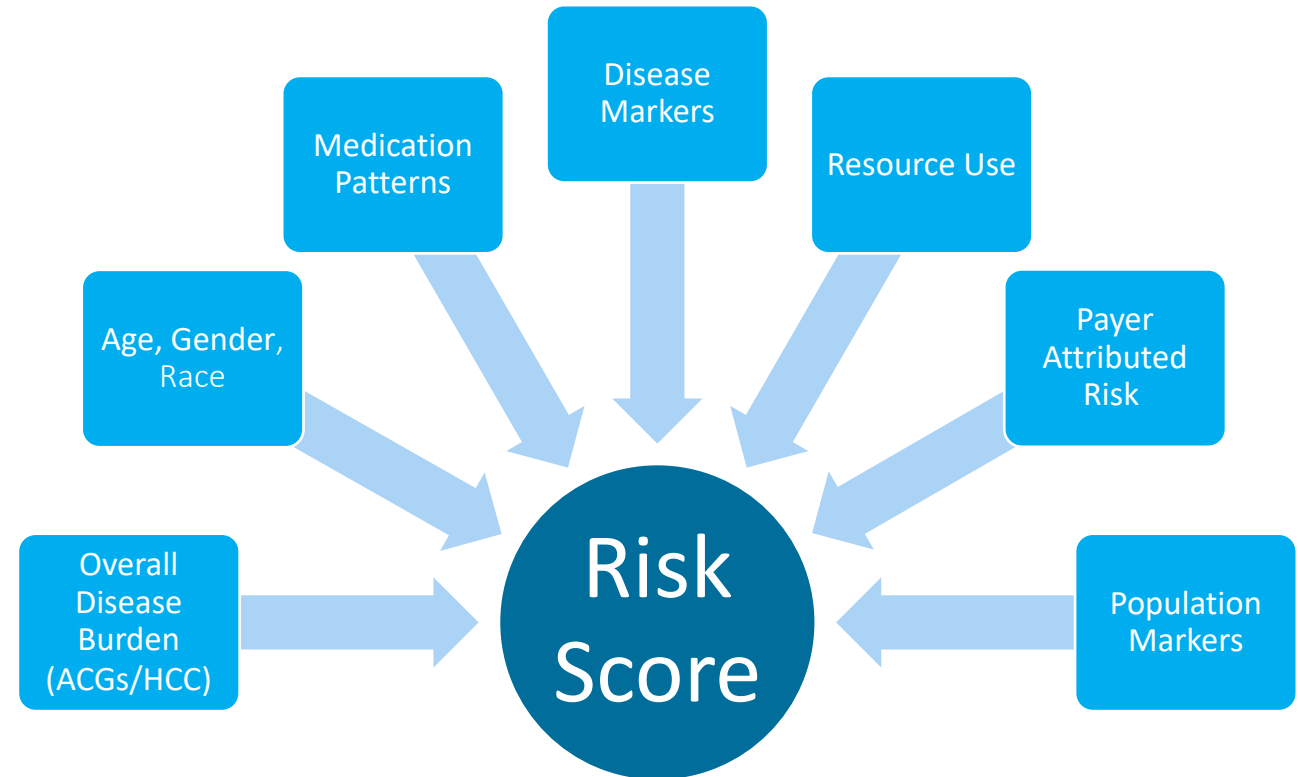


Risk Stratification Models

Not all scores are created equal

Potential Data Input

- Demographics
- Medical Services and Diagnoses
- Pharmacy
- Lab
- SDoH (Social determinants of health)



Main risk score outputs should include
concurrent risk and prospective risk = ~ total risk (*cost*)

Risk Stratification Models and Cohorts

Not one-size-fits-all

Risk Stratification & Cohorts

Standard Care Coordination Cohorts:

- CMS Transition Care Management cohort
- CMS Chronic Care Management Cohort

Value-Add Predictive Risk Stratification Models:

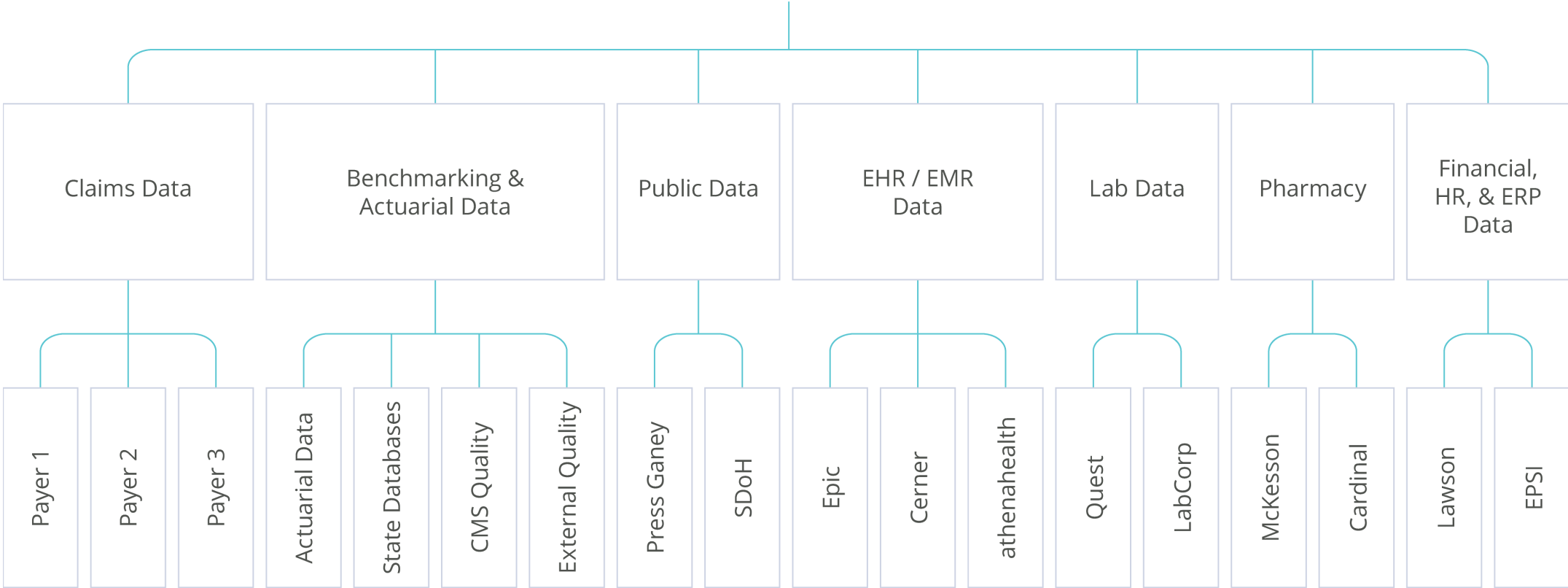
- Johns Hopkins ACG® System:
 - Predictive Risk – Est. Cost vs. Avg. Pt. Over Next 12 mo.
 - Concurrent Risk – “Resource Utilization Bands” or RUBs
 - Likelihood of Hospital Admission: Individual additional factors for Extended Stay, Injury Related, and ICU
 - Likelihood of Pt. Being in Top 5% of Spend (Next 12 mo.)
 - Risk of Poor Care Coordination – Identifies potential cost overruns for patients who may be using specialists as PCPs
 - Unexpected Pharmacy Costs
- NYU Avoidable ED: Utilizes a client-configurable set of “Avoidable” and “Non-Avoidable” diagnoses to determine appropriateness of venue
- Charlson Comorbidity Index: Predicts one-year mortality likelihood for patients with multiple comorbid conditions
- Hierarchical Condition Coding (HCC): Communicates patient complexity through IDC10 groupers
- LACE Index: Scoring tool for risk assessment of death and readmissions



High-Value Data Powers Your Risk Stratification Model

The power of multi-source data integration

High-Value Data



Standardized definitions (e.g., LOS), ability to match patients and risk-adjusted provider roster

How to Measure the Effectiveness of your Interventions

Methodology for Measurable Outcomes



Improved Care for Those at Risk for COVID-19 Mortality

MemorialCare ACO addresses the COVID-19 outbreak

1 Identify Opportunity

- All clinical and claims data in MemorialCare's ACO and HMO plans

2 Stratify Population

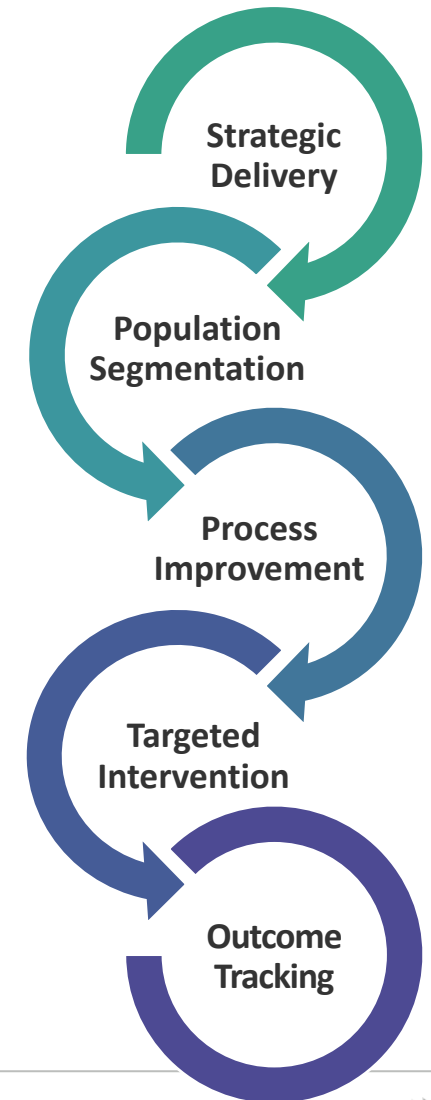
- **Extremely high risk:** Patients with complex health problems — including organ transplant, active cancer with chemotherapy, leukemia, lymphoma, and cystic fibrosis — are at higher risk of severe illness from COVID-19.
- **High risk:** Category further stratified into three subcategories:
 - All patients over the age of 70 years, regardless of any medical condition
 - Patients under 70 years old with an underlying health condition, including, but not limited to, asthma, COPD, heart failure, chronic kidney disease, and diabetes
 - Pregnant women

3 Targeted Interventions

- Care managers could see the specific factors driving member-level risk

4 Outcomes

- 66% of patients in the extremely high-risk category were engaged by care management
- Executed in **4 days**, savings total of **\$2.3M**



Improving Care Coordination for High Impact Chronic Conditions

Chronic Kidney Disease (CKD)

1 Identify Opportunity

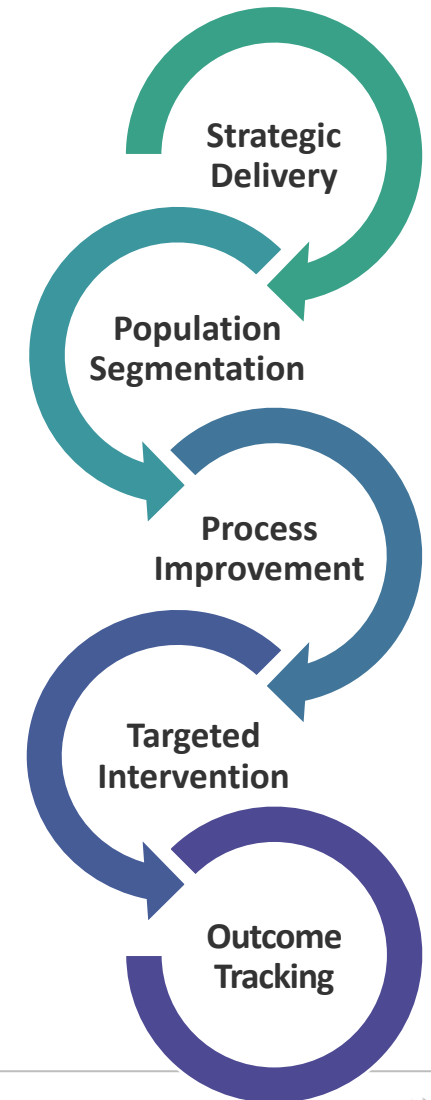
- Medical spend of patients with CKD 12% higher than benchmark, driven by IP, SNF, readmits, and imaging
- Noting difficulty accessing care, many CKD patients are seen by multiple in-network and out-of-network providers

2 Stratify Population

- Identify patients with CKD and other high-impact chronic conditions
- Stratify patients by predicted risk, care density and coordination risk, and SDoH

3 Targeted Interventions

- CKD Screening
- Automated outreach for patients with diabetes and no annual eGFR/Albuminuria labs and in-visit provider alerts for care gaps and lab referral
- Tiered Care Coordination
- Digital intervention for screening questionnaire, ongoing management, and patients new to dialysis
- Care management engagement for patients escalated from digital intervention, patients with health-related social needs, outstanding care gaps, and at high or rising risk



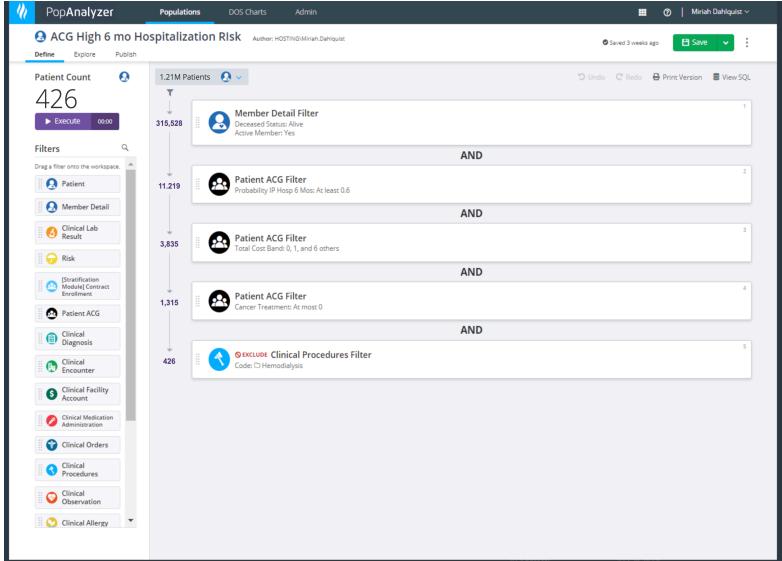
Empower Change with Actionable Workflows

Reduce burnout with effective outreach strategy and workflows

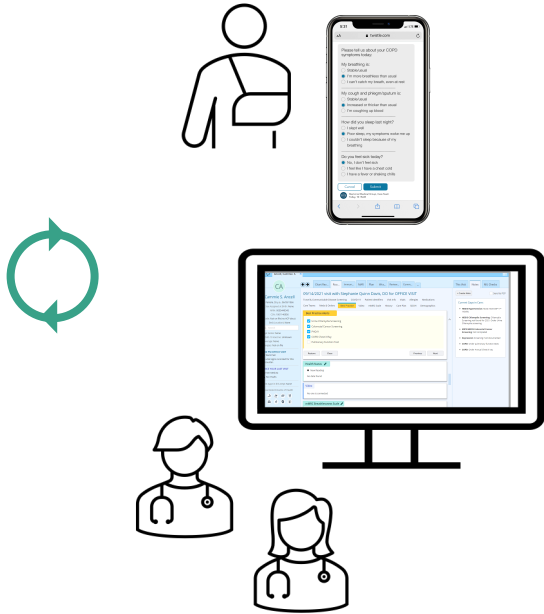
Care Coordination Programs

- Transition of Care
- Chronic Care Management
- High ED Utilization
- Behavioral Health
- Disease Management

Stratify & Build Actionable Cohort



Native Workflows



Data Integration



Improve Outcomes of COPD Patients

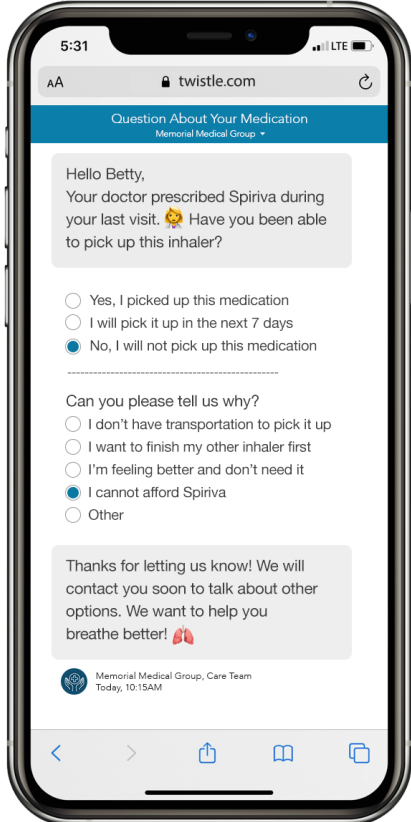
1 Identify Opportunity: COPD patients

2 Stratify Population

The screenshot shows the PopulationBuilder interface. The main title is "ACG: Patients with COPD and High 6 mo Hospitalization Risk" by author HOSTING Miriah.Dahlquist. The patient count is 180. The filters are defined as follows:

- 1. ACG: COPD flag (COPD Condition: BTH, ICD, and 1 other) - 79,003 patients
- AND
- 2. ACG IP hospitalization probability at least .6 (6 mo) (Probability IP Hosp 6 Mos: At least 0.6) - 337 patients
- AND
- 3. Current ACG cost band excludes the highest tiers (Total Cost Band: 0, 1, and 6 others) - 200 patients
- AND
- 4. Patient not currently undergoing cancer treatment (Cancer Treatment: At most 0) - 188 patients
- AND
- 5. EXCLUDE Excludes patients on hemodialysis (Code: Hemodialysis) - 180 patients

3 Targeted Interventions – Post Discharge



Improve Outcomes of COPD Patients

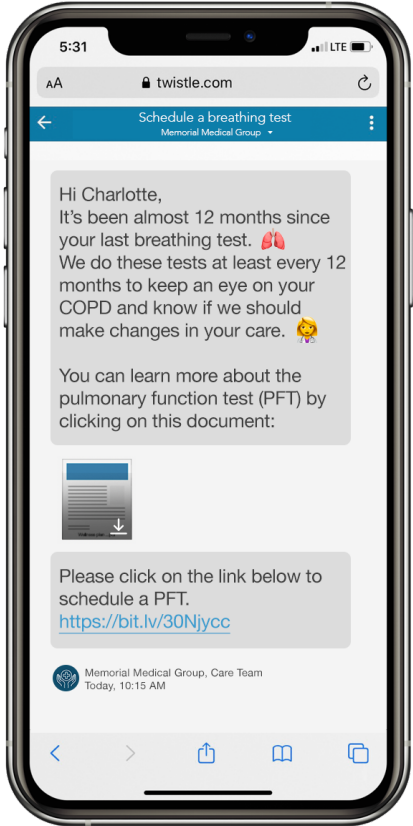
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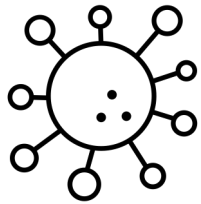
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3 Targeted Interventions – Preventative, PFT



Healthcare Inequity



Of **110** Predominantly Black Counties
 > **3x*** Infection Rate
 > **6x*** Death Rate

* than predominantly white counties

PEOPLE OF COLOR ACCOUNT FOR
 < 10% OF PHYSICIANS
 < 15% OF NURSES & NURSE PRACTITIONERS



LGBT youth receive poor quality care due to stigma, lack of healthcare providers' awareness, and insensitivity to their unique needs.

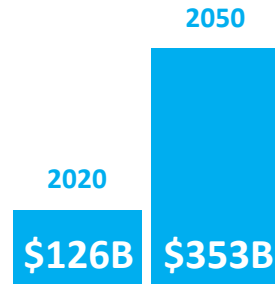


< 50%

of returning veterans needing mental health services receive treatment. Of those receiving PTSD and major depression treatment,

< 1/3

are receiving evidence-based care.



Economic burdens of health disparities in the U.S. if unchanged.



JAMA Pediatrics Study found an increase in teenagers' stress and worry about discrimination. More stress translates into drinking, smoking, and experimenting with drugs.



U.S. Korean children are **4x** more likely to have no health insurance as compared to others



~23.5 million Americans are living in food deserts, associated with adverse cardiovascular outcomes in patients with coronary artery disease, independent of their traditional cardiovascular risk factor burden.



African Americans are more likely than whites to die of diabetes and have a higher prevalence of hypertension and heart disease.



Black children are **4x** as likely to be admitted to the hospital for asthma.



40% of Mexicans and Mexican Americans, 26% of Cubans, and 21% of Puerto Ricans were uninsured in 2006 as compared with 16% of white non-Latinos



Lower birthweight babies are born to African American mothers suffering from discrimination.

19.4% of Asian adults compared to 12.9% of whites report being without a usual source of healthcare.

Sources: Washington Post, JAMA Pediatrics Study 2018, MHA Keystone Center, NIH, AHA, VA +



Improve Postpartum Detection of Type 2 Diabetes

Results

- ✓ **92% increase** in diabetes screenings
- ✓ **213% increase** in detection rates for Type 2 Diabetes
- ✓ **211% increase** in screening among Black women
- ✓ **577% increase** in detection of Type 2 Diabetes among Black women



The text-based messaging program [Twistle] increased screening compliance by 92%, which improved our diabetes detection rates and alleviates radical disparities in healthcare.

– Helen Gomez, MD

Resident, ChristianaCare

Preconfigured communication pathways delivered time-based, HIPAA-compliant education reminders, reducing clinical workload.

Predictive Risk Stratification: Using Analytics to Empower Change

Important takeaways

1. Create workforce efficiencies by automating predictive risk stratification with multiple data inputs
2. Understand the importance of rising risk and high-cost cohorts
3. Drive measurable outcomes (people, processes, technology) with focused process improvements
4. Demonstrate financial and clinical outcome improvement results with case examples





Questions?

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