Riya Pulicharam, MD

National Medical Director for Population Health, Healthcare Partners

Riya Pulicharam, MD, is a pediatrician by training, and is currently the National Medical Director of Population Health Management & Clinical Outcomes for HealthCare Partners, a DaVita Medical Group, based in El Segundo, California. In her current role she oversees the national Population Health Department for HealthCare Partners Medical Group. She founded the Clinical Research & HEOR and disease management departments, for HCP in 2003. She also pioneered the initial design and workflow of the Disease Management and Clinical Outcomes programs in 2003. Riya is a certified clinical trials investigator and has been featured in numerous publications. She has led over 500 research studies over 18 years of her career. Dr. Pulicharam has participated in industry advisory boards overseeing drug development and regulatory affairs, as well as designing phase 1 through 4 trials for major pharmaceutical companies. She also lectures at the USC School of Pharmacy and is a subject matter expert in integrative medicine and Population Health. Riya attended medical school at the Medical University of Debrecen and completed her pediatric residency. Dr. Pulicharam was a research fellow at the Department of Obstetrics and Gynecology at Harbor UCLA Medical Center prior to joining HealthCare Partners in 2002.
Steven Evans, MD  
Vice President, Utilization Management and Quality Improvement, HealthCare Partners, Las Vegas

Dr. Evans has served as VP for Population Health, Pharmacy Director, and Senior Medical Director for UM and Quality at Healthcare Partners, Nevada since 2012. Between 2006 and 2012, Dr. Evans served as Chief Medical Officer, VP for Medical Affairs, and Director of Pharmacy Services for United Healthcare Nevada since 1996. Between 1996 and 2012, Dr. Evans served as Medical Director for Pharmacy and Medical Claims and Chairman of the Pharmacy and Therapeutics Committee for Sierra Health Services/UnitedHealthcare, Nevada. Between 1993 and 2007, Dr. Evans also served in multiple Leadership roles at Southwest Medical Associates. Dr. Evans maintains an active consulting practice in addition to his clinical and leadership roles.

Dr Steven Evans graduated Summa cum Laude from USC with a BS/Psychobiology, followed by an MD at UCLA where he was honored with the Warren Medal as Valedictorian. Following medical school, Dr. Evans interned in Internal Medicine at UCLA and was a resident in Anesthesiology at UCSD.

Kevin Zhao, MS, MBA  
Founder and Chief Technology Officer, Harmonize Health

Kevin has an unbridled passion for med-tech and has spent the last decade developing cutting-edge patient monitoring systems. He founded Harmonize with the goal of making digital health accessible, user friendly, and high impact for patients and clinicians.
Project Trident

IRB Approved Pilot

“Evidence Based Approach Supporting High-Risk Patients via Technology and Clinical Oversight”

Riya Pulicharam, MD, CPI and Steve Evans, MD
U.S. Population Health Status

1/3 of the American population suffers from multiple comorbidities. Patients with 5 or more chronic illnesses have, on average,

- Have 50 prescriptions filled
- See 20 different physicians
- Make 40 physician office visits per year
- Have multiple admissions per year
Health Factors

90% of our health is determined by factors outside of clinical care

- 10% Health Care
  - Clinical Care

- 40% Individual Behavior
  - Stress Management
  - Diet & Exercise
  - Care Plan Adherence

- 20% Social & Environmental
  - Home & Family
  - Mental Wellness
  - Economic Stability

- 30% Genetics
  - Genomics & Medical History

Source: The Journal of the American Medical Association, the New England Journal of Medicine & the Kaiser Family Foundation
The Potential of Remote Care

CHF RPM Analysis: Admissions

- Included Graduated, Active and Deceased pts
- Adjusted for # of hospitalizations at baseline
- Adjusted for age, gender, COPD, A.Fib
- Statistically Significant Results

30% Reduction in All-Cause Admissions (p=0.03)

COPD Post Discharge Readmissions

- Primarily driven by labor-intensive workflows on small patient populations

<table>
<thead>
<tr>
<th>CHF RPM Analysis: Admissions</th>
<th>COPD Post Discharge Readmissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>*p = 0.03</td>
<td>30-Day Readmission Rate</td>
</tr>
<tr>
<td></td>
<td>60-Day Readmission Rate</td>
</tr>
<tr>
<td></td>
<td>90-Day Readmission Rate</td>
</tr>
<tr>
<td>Intervention</td>
<td>8%</td>
</tr>
<tr>
<td>Control</td>
<td>18%</td>
</tr>
<tr>
<td>Intervention</td>
<td>12%</td>
</tr>
<tr>
<td>Control</td>
<td>28%</td>
</tr>
<tr>
<td>Intervention</td>
<td>20%</td>
</tr>
<tr>
<td>Control</td>
<td>32%</td>
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</tbody>
</table>
Tackling High Risk: IRB-Approved Study

“Remote Patient Monitoring for High-Risk Patients”

(Project Trident)  Approved 11/12/2018

• **Primary Objective:** Reduced hospital admissions, hospital readmissions, and ER visits (all-cause) after study enrollment

• **Secondary Objectives:** Overall healthcare resource utilization, PCP and specialist utilization, overall cost, health-related quality of life (HRQOL), physician and patient satisfaction
Project Trident

IRB-approved Study
12-month long pilot

High-risk patients
4 or more comorbidities* and 1 hospitalization within the past year

1200 Patients
600 intervention vs. 600 control Matched Cohorts (age, sex, comorbidities)

Bluetooth-enabled sensors
Transmits biometric data via cellular or Wi-Fi service
Vitals to be Monitored & Intervened Upon

<table>
<thead>
<tr>
<th>Vitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Pressure</td>
</tr>
<tr>
<td>Weight</td>
</tr>
<tr>
<td>Blood Sugar</td>
</tr>
<tr>
<td>Pulse Rate</td>
</tr>
<tr>
<td>Pulse Oximetry</td>
</tr>
</tbody>
</table>
Key Components

**Population Health Management**
- RN & LVN: Care management, disease management
- PharmD: Medication reconciliation at transitions of care
- Dietician: Dietary and lifestyle education
- MA: Standing orders

**Platform Partners**
- Insulin algorithm software
- EMT/paramedic service
- COPD in-home respiratory assessment
# Preliminary 6-month Program Outcomes

<table>
<thead>
<tr>
<th>Project Trident Month Outcomes**</th>
<th>Intervention Group</th>
<th>Matched Comparison***</th>
<th>Relative Decrease in Admissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Avg Age = 72.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male Avg Age = 73.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inpatient Admissions</td>
<td>47</td>
<td>107</td>
<td>51%</td>
</tr>
<tr>
<td>Observations</td>
<td>22</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>ER Visits</td>
<td>153</td>
<td>232</td>
<td>52%</td>
</tr>
</tbody>
</table>

**Criteria: At least 6 Months Program Participation and are Active Program Participated
***Matched Comparison Cohort
**** Analysis: Nov 2019

51% % reduction in Admissions
51% Reduction in Admit Equivalents
52% Reduction in ER Visits
Challenges We Faced

**Usability**

**NEEDS** to “just work” out of the box

**Decision Support**

Manage patient encounters, route alerts to proper personnel, track interventions, etc.
Overcoming the Barriers

Patients receive wireless sensor kits

Simple measurement interface with no setup required

Patients automatically connected to triage with full decision support

The average elderly, high-risk patient submits vitals over 25x per month
Preliminary 6-month Outcomes

• Trident Active Admit Reduction: 51%
• Trident Active Admit Equivalent Reduction: 51%
• Trident Active ER Reduction: 52%
• ROI is roughly ~7:1
Examples of Interventions

**LOW LEVEL**

**Behavioral Modifications**

Alerts escalated to:
Health coaches and engagement specialists on Harmonize platform

**MEDIUM LEVEL**

**Home Interventions**

Alerts escalated to:
Home health services & third party providers on Harmonize platform

**HIGH LEVEL**

**Clinician Intervention**

Alerts escalated to:
Patient's primary care providers
## Real Patient Outcomes

<table>
<thead>
<tr>
<th>Medication titration</th>
<th>Medication adherence</th>
<th>Behavioral &amp; lifestyle adherence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient 1</strong>: CHF, Diabetes, Hypertension</td>
<td><strong>Patient 2</strong>: A-Fib, CHF, Hypertension</td>
<td><strong>Patient 3</strong>: COPD, A-Fib, CHF, Diabetes, HTN</td>
</tr>
<tr>
<td><strong>Issue</strong>: Swelling in lower extremities.</td>
<td><strong>Issue</strong>: Alert showed increase in BP.</td>
<td><strong>Issue</strong>: Oxygen saturation decreased.</td>
</tr>
<tr>
<td><strong>Outcome</strong>: Titrated medication and added water pills, which ultimately prevented an ER visit.</td>
<td><strong>Outcome</strong>: Medication was titrated. Patient was connected to a dietician to enforce accountability and medication adherence.</td>
<td><strong>Outcome</strong>: Clinical alert generated. Triage sent EMT to patient’s home, which revealed that patient’s oxygen tank tubing was tangled.</td>
</tr>
</tbody>
</table>
Unique Program Addons

- Extensions to Other Use Cases (COVID-19)
- Anti fatigue Measures such as gamification
- Individualized Measurement Schedules
- Customizable Alerts
- Integration to the EHR
- Cellular Data Connections
- Health Coaches
- Dieticians
- Pharmacists
- Urgent Care Providers Dispatched to the Home
- True “Open the Box and Play”
Female 72 years old with COPD, CHF, AND DIABETES

**Device Input to Generate Alert:** Fever with patient-reported cough

**Triage Information Obtained**
1. Had been tested at an emergency room 3 days before and awaiting results
2. Persistent productive cough for 9 days. No shortness of breath
3. Very concerned because wanted to know why she was not better yet
4. Was planning to go to emergency room again
5. Had changed PCP last month and did not know new PCP

**HCPNV Provider Action**
1. Video visit to assess symptoms
2. Reassured and explained quarantine method
3. Prescribed antibiotics and Tamiflu
4. Checked on Covid-19 test for next 2 days, which came back negative