Mobile Integrated Health: Community Paramedicine

Initial Quarterly Report

June 2018 – August 2018

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SECTION 1: Overview of Mobile Integrated Health

The University of Maryland Medical Center (UMMC) and the Baltimore City Fire Department (BCFD) have partnered to implement two Mobile Integrated Health Community Paramedicine pilot programs in West Baltimore. **Transitional Health Support** (THS) is designed to improve the success rate of transitioning complex patients from hospital to home. **Minor Definitive Care Now** (MDCN) links lower acuity patients' usage of the city's 911 system with appropriate on-scene medical care.

Transitional Health Support

THS provides in-home, community-based services to high-acuity patients being discharged from the UMMC to their home (see Section 2, below).

Vision: Improved health at less cost for medically and socially challenged individuals in West Baltimore.

Mission: Establish a seamless, coordinated and intensive support program for complex patients in West Baltimore that improves health and decreases health care utilization and costs.

Objectives:

- Reduce 30-day unplanned readmissions rate
- Reduce potentially avoidable use of emergency medical services (EMS), emergency departments (EDs), and hospitals as well as overall cost
- Improve coordination of medical, behavioral, and social services across all disciplines

Minor Definitive Care Now

MDCN will provide low-acuity 911 callers with the option to receive immediate, on-scene care by an advanced level provider and a BCFD paramedic. The patients will be connected to appropriate follow-up care, either in or outside the University of Maryland Medical System (UMMS) (see Section 3, below).

Vision: To optimally support the health of individuals in West Baltimore who seek care through the 911 system for low-acuity complaints.

Mission: To demonstrate clinical and economic value to the health system in West Baltimore by delivering quality care to low-acuity patients.

Objectives:

- Preserve EMS and ED resources for life-threatening emergencies and disasters
- Enhance health system integration and appropriate use of health care resources by individuals in West Baltimore
- Provide on-location medical care to consenting individuals who have called 911 in West Baltimore

Baltimore City Fire Department conducted advanced community paramedicine (Connect Travel Academy) training

SECTION 2: Transitional Health Support

The Transitional Health Support program utilizes a multi-disciplinary team to provide robust, patient-centered support to individuals at home, linking medical, pharmacological, social and community resources.

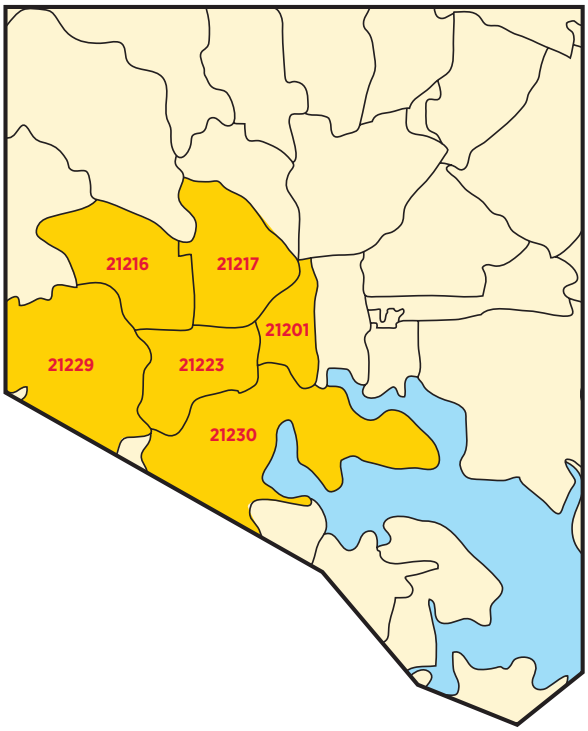
Our Community Paramedicine Team provides the following assessments, services and support throughout the 30 days following discharge from the hospital:

- Social/functional assessments
- Environmental assessments
- Fall risk assessments
- Prescription medication reconciliation
- Medical assessments
- Coordination of resources to meet patients' needs

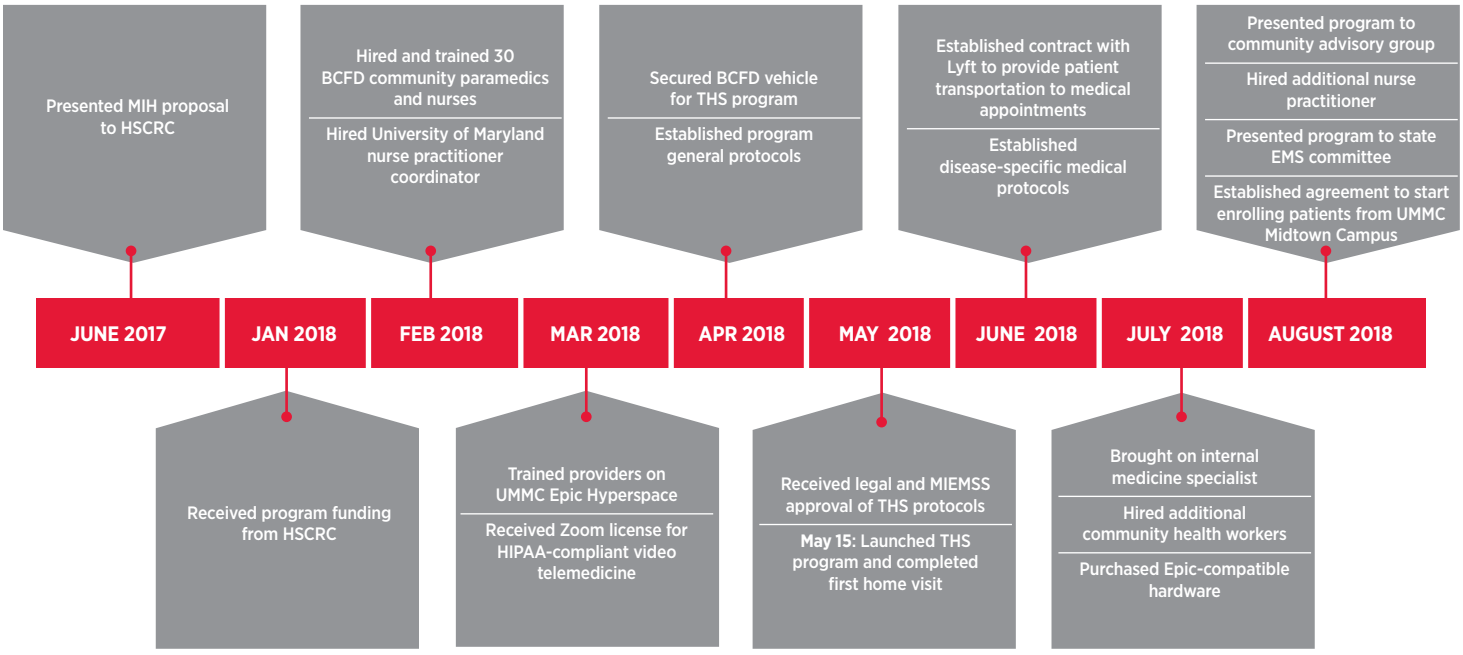
The team, consisting of a BCFD community paramedic, a BCFD registered nurse (RN), a UMMC nurse practitioner (NP), and/or a UMMC physician, deliver in-home follow-up care and assist with chronic disease management for 30 days after hospital discharge. Through the support of an interdisciplinary Operations Center, staffed by pharmacists, social workers, nurses, physicians, community health workers, and EMTs, the program comprehensively addresses barriers to achieve improved health for enrolled patients.

THS catchment area:

The map below identifies the eligible West Baltimore zip codes for patient enrollment

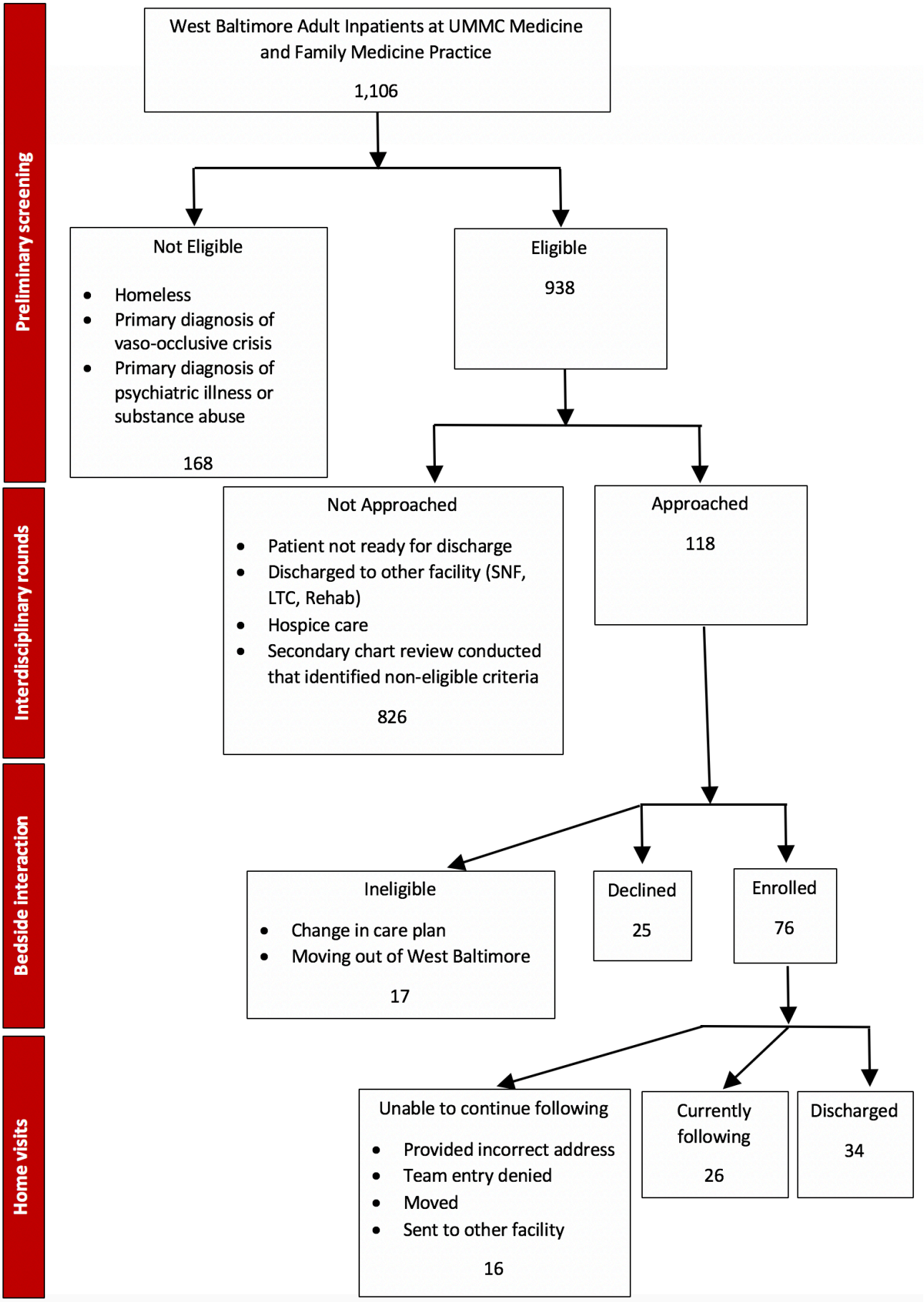


Transitional Health Support Timeline of Activities and Deliverables



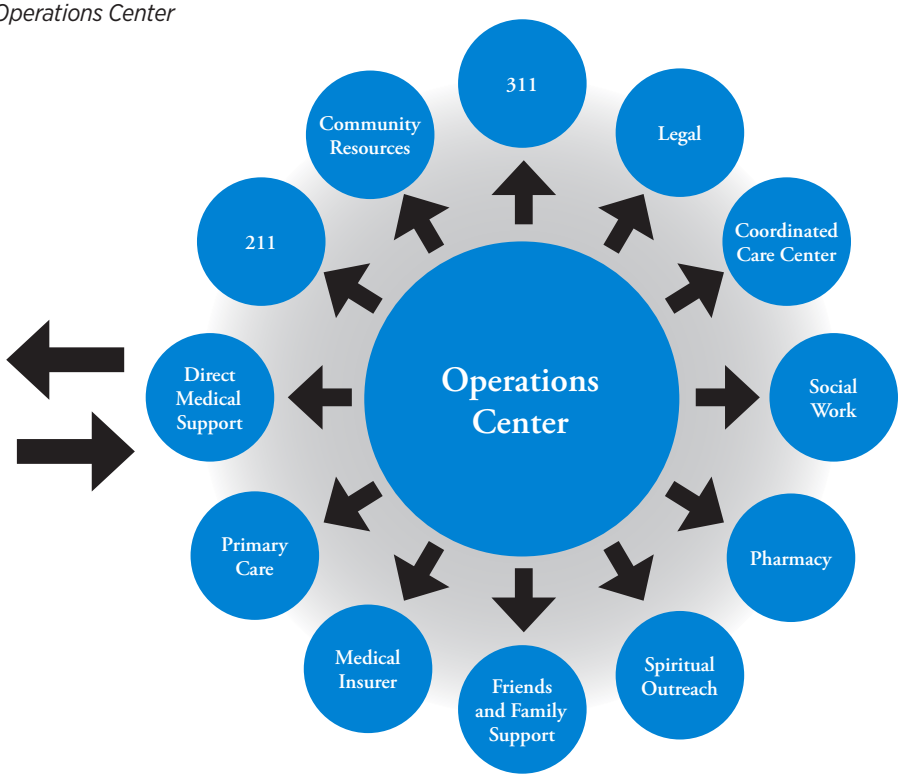
Enrollment Statistics (May through August 2018)

The in-hospital process in which patients are screened, identified, consented and enrolled into the THS program



THS Operational Model

THS providers assessing a patient and the robust multidisciplinary support provided to the team coordinated through the UMMC Operations Center

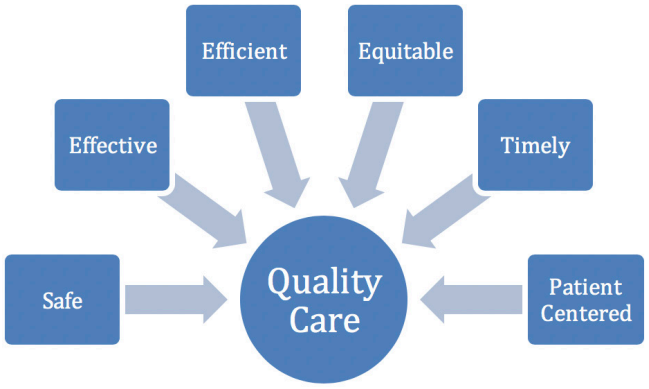


Quality Assurance

Program staff performs robust quality assurance to ensure optimal patient outcomes, based on the Institute of Medicine's six domains of health care quality.[1] We believe this emphasis will ensure that every step in the process of supporting health will adhere to standards that will help the program fulfill its overall goals.[2] The UMMC and the BCFD worked together to define quality assurance metrics that are relevant to the program and to both entities.

Six Domains

Diagram illustrating the six aims of quality healthcare put forth by The Institute of Medicine's six aims of quality health care



[1] Institute of Medicine (IOM). Crossing the Quality Chasm: A New Health System for the 21st Century. Washington, D.C: National Academy Press; 2001.

[2] Kohn LT, Corrigan JM, Donaldson MS. Crossing the Quality Chasm: A New Health System for the 21st Century. Institute of Medicine, 2001.

THS Program Data

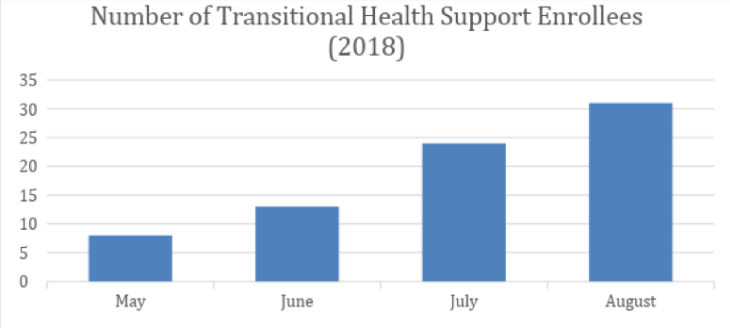
- To date, no patient safety adverse events have occurred, 100% of protocols are evidence based, and patient satisfaction scores are positive (see Outcomes Section, below).
- During May through August 2018, the THS Program spent an average of 63 minutes per initial visit, with an average of 42 minutes per follow-up visit in the patient's home. The length of the initial and follow-up visits averaged 45 minutes.

Demographic Information

Characteristics	N=34
Age in years, mean (SD)	62.2 (12.1)
Female sex, n (%)	22 (64.7)
Race, n (%)	
African American	31 (91.2)
White	3 (8.8)
Inpatient (vs observation), n (%)	24 (70.6)
Arrival mode, n (%)	
Ambulance	16 (47.8)
Car	16 (47.8)
Walking	2 (4.3)
Primary diagnosis, n (%)	
Hypertension	8 (23.5)
Virology/Infectious disease	8 (23.5)
COPD/Pulmonary	5 (14.7)
Other	13 (38.2)
Payor, n (%)	
Medicaid	10 (29.4)
Medicare	21 (61.8)
Commercial	3 (8.8)

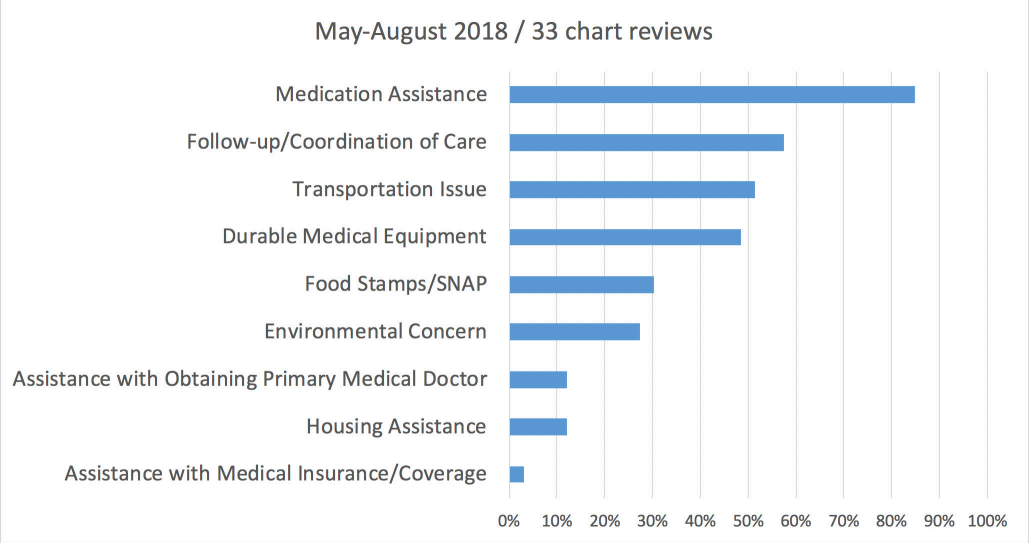
Enrollment Over Time

Patient enrollment since program inception



Proportion of Patients with Health Concerns and Type

Specific health concerns identified through chart reviews



Evaluation and Outcomes
The THS Program will be evaluated on its ability to affect the various outcomes.

A study will be designed to determine the effect of the program on the primary endpoint of 30-day all-cause hospital readmissions compared with the current standard of care and the secondary endpoints of EMS and ED use as well as overall cost.

Study designs will be used to evaluate how the program affected resolution of patients' needs such as medication reconciliation, coordination of care, environmental, and financial needs and the relationship between resolution of these needs and potentially avoidable health care utilization.

Preliminary Findings
- The 30-day risk-adjusted readmission rate for THS patients who were readmitted to an UMMS hospital is 12.9% (N=24 discharged inpatients). In comparison, the UMMC medical service risk-adjusted readmission rate is 15.1% for calendar year 2017.[3]
- Within the first quarter, the program experienced four readmissions. All four patients were directed by Mobile Integrated Health medical providers to seek further medical evaluation during one of the team's routine home visits.
- Upon case review, it was determined by the MIH leadership that that these readmissions were appropriate for these four patients.

Patient Satisfaction
Survey results from first quarter

How would you rate this program on a scale of 1 to 10, where 1 = BAD and 10 = GOOD (n=25)?	
Score (1–10)	**9.7/10**
THS Enrolled Patient Testimonials: "The program helped change my transportation [to and from dialysis] to a different company that is more reliable." "The team was able to catch my pneumonia right on time and helped me." "All parts of the program are helpful … they explained how to take my medications."	

Next Steps
- Explore the use of a paramedic/paramedic team.
- Pilot medical in-home protocols for congestive health failure (CHF), chronic obstructive pulmonary disease and diabetes.
- Increase enrollment by expanding bedside recruitment to cardiology services at UMMC and to the Medicine and Family Practice services at the UMMC Midtown Campus.
- A trial to measure the effectiveness of THS will begin once IRB approval is received.
  - An internationally validated readmission score (the HOSPITAL Score) is currently being implemented in Epic.[4]
  - A comprehensive analysis of THS readmissions across the State of Maryland will be conducted using data from Chesapeake Regional Information System.

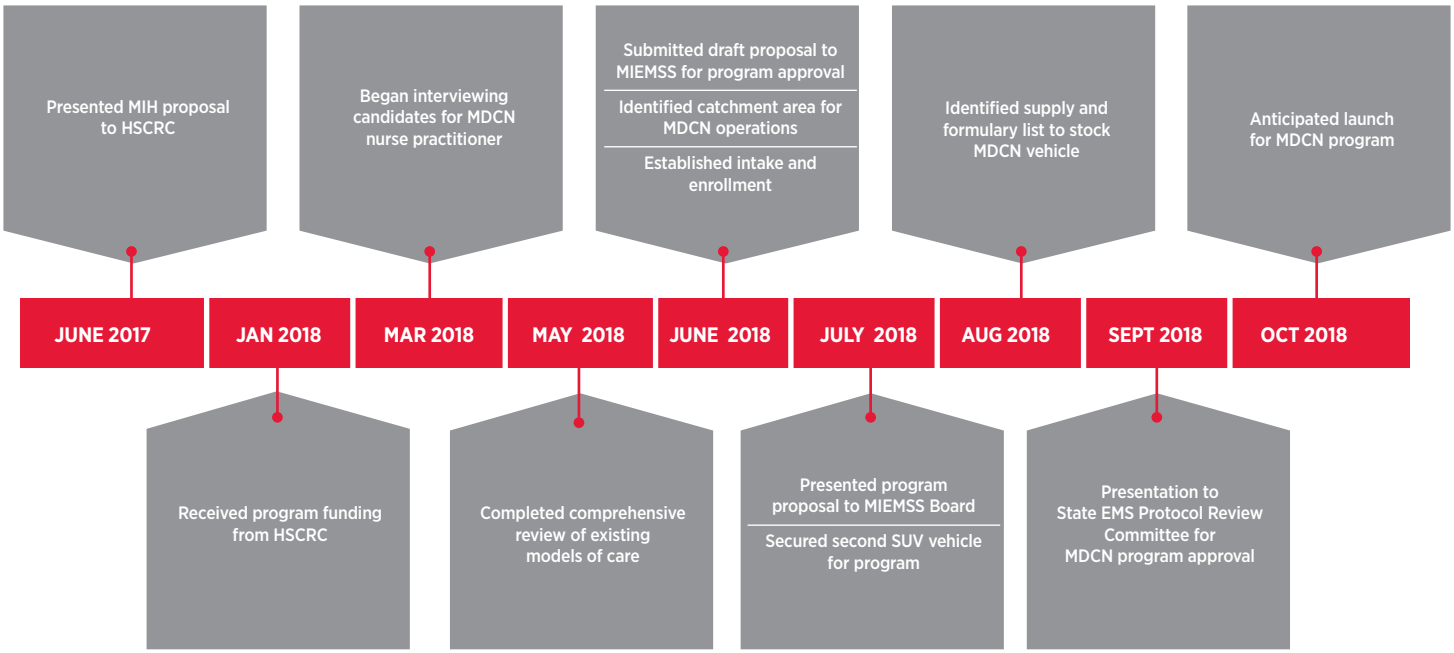
[3] This rate is calculated according to the Maryland Health Services Cost Review Commission risk adjustment methodology based on APR-DRG and severity of illness.
[4] Donzé JD, Williams MV, Robinson EJ, et al. International validity of the HOSPITAL score to predict 30-day potentially avoidable hospital readmissions. JAMA Internal Medicine. 2016;176(4):496-502.

SECTION 3: Minor Definitive Care Now

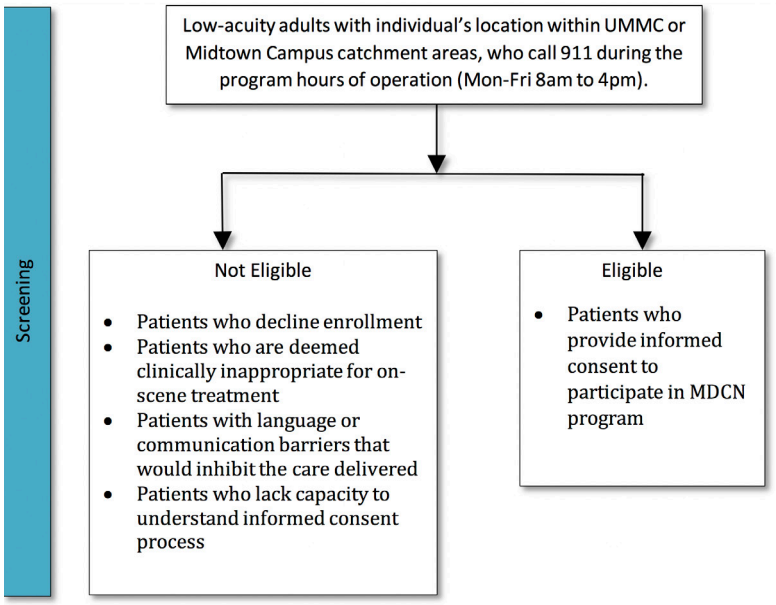
In the setting of any and all emergency calls, BCFD will dispatch a normal response to the scene. For appropriate, low-acuity 911, and with patient consent, the MDCN team participates in the assessment of the ill or injured individual with the emergency providers at scene. The paramedic-nurse practitioner MDCN team will then complete a thorough evaluation of the patient, render definitive outpatient care on-scene and arrange follow-up with appropriate providers in coordination with the UMMC Operations Center.

Minor Definitive Care Now (MDCN) is awaiting final approval by the EMS Board within the Maryland Institute for Emergency Medical Services Systems (MIEMSS) and is anticipated to "go live" in October 2018

Minor Definitive Care Now Timeline



Enrollment



Additional Potential MDCN Benefits:

- Increased linkage to primary care physicians
- Reduced use of EMS and EDs for non-emergent conditions
- Reduced ED wait times

Quality Assurance

The MDCN QA/QI Committee will conduct weekly teleconferences during the MDCN Pilot Program to review cases, discuss emergent trends, ensure that pilot protocols lead to optimal triage, and identify areas for improvement. Any unscheduled re-entry of MDCN patients into the emergency health care system, that occur within 72 hours of treatment, and are associated with the original EMS complaint, will trigger automatic review by the QA/QI Committee.

Evaluation and Outcomes

The impact of this program will be evaluated with a prospective, randomized concurrent-control trial.

Key MDCN program metrics include, but are not limited to, the following:

1. Number of EMS transports to an ED
2. Unscheduled re-entry into the health care system (associated with the original EMS complaint) within a 72-hour period
3. Total call duration for MDCN calls (i.e., time from notification of EMS transport units and suppression units until they go back in service)
4. Changes in average ED wait times related to implementation of the MDCN Pilot Program
5. Patient satisfaction survey results

Program Leadership

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