PARTNERS HEALTHCARE SYSTEM, INC.
DON APPLICATION # PHS-19040915-HE
ATTACHMENTS

SUBSTANTIAL CAPITAL EXPENDITURE
DON-REQUIRED EQUIPMENT
MASSACHUSETTS GENERAL HOSPITAL

APRIL 26, 2019

BY

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ELECTROPHYSIOLOGY RENOVATION AND EXPANSION

Factor 1: Applicant Patient Panel Need, Public Health Values and Operational Objectives

F1.a.i **Patient Panel:**
Describe your existing Patient Panel, including incidence or prevalence of disease or behavioral risk factors, acuity mix, noted health disparities, geographic breakdown expressed in zip codes or other appropriate measure, demographics including age, gender and sexual identity, race, ethnicity, socioeconomic status and other priority populations relevant to the Applicant's existing patient panel and payer mix.

A. Partners HealthCare Patient Panel

Partners HealthCare is a not-for-profit, integrated health care system that was formed in 1994 by an affiliation between The Brigham Medical Center, Inc. (now known as Brigham Health) and The Massachusetts General Hospital. Partners HealthCare currently operates two tertiary hospitals, six community acute care hospitals, and one acute care specialty hospital in Massachusetts; one community acute care hospital in Southern New Hampshire; one facility providing inpatient and outpatient mental health services; and three facilities providing inpatient and outpatient services in rehabilitation medicine and long-term care. Partners HealthCare also operates physician organizations and practices, a home health agency, nursing homes and a graduate level program for health professionals. Partners HealthCare is a non-university-based nonprofit private medical research enterprise and its academic medical centers are principal teaching affiliates of the medical and dental schools of Harvard University. Partners HealthCare provides its services to patients primarily from the Greater Boston area and eastern Massachusetts, as well as New England and beyond. Additionally, Partners HealthCare operates a licensed, not-for-profit managed care organization that provides health insurance products to the MassHealth Program (Medicaid), Commonwealth Care (a series of health insurance plans for adults who meet income and other eligibility requirements) and commercial populations.

Partners HealthCare serves a large and diverse patient panel as demonstrated by the utilization data for the 36-month period covering Fiscal Year ("FY") 16-18 and the preliminary data available for FY19.[1] Attachment 2 provides this demographic profile for Partners HealthCare in table form. The number of patients utilizing Partners HealthCare's services has increased[2] since FY16, with 1,377,250 unique patients in FY16, 1,403,853 unique patients in FY17 and 1,500,670 unique patients in FY18.[3] Preliminary data indicate that for the first six week of FY19

[1] Fiscal year October 1 – September 30. While preliminary data is available for FY19, annual comparisons are calculated using data for FY16-18 as the FY19 data is only for the first six weeks of the new fiscal year and will change over time.

[2] The methodology for aggregating Partners HealthCare's patient panel data has evolved into an automated process utilizing internal data resources. Initially, in 2017, when Partners HealthCare began developing its patient panel for Determination of Need applications, such as the Change of Ownership for Massachusetts Eye and Ear and the Substantial Capital Expansion for Brigham and Women's Hospital, staff manually aggregated the necessary data. However, since these submissions, Partners HealthCare staff have developed a new automated process that allows for the collection and amalgamation of system-wide data. This refined methodology allows staff to continuously monitor and improve the way that data are aggregated. Accordingly, between June 2018 and October 2018, staff further refined the data collection processes leading to a decrease of no more than 5% in overall patient counts for the system. Staff will continue to refresh and refine the process for aggregating data across the system, leading to more exact patient panel data.

[3] Entities include: Brigham and Women's Hospital, Brigham and Women's Faulkner Hospital, Massachusetts General Hospital, Newton-Wellesley Hospital, and North Shore Medical Center; Cooley Dickinson Hospital, Martha's Vineyard Hospital, McLean Hospital, and Nantucket Cottage Hospital (post-Epic data only); Massachusetts Eye and Ear Infirmary (outpatient post-Epic data only); Spaulding Rehabilitation Hospital (Telehealth, Partners Mobile Observation

Partners HealthCare had 398,563 unique patients. Partners HealthCare's patient mix consists of approximately 42% males and 58% females. The Massachusetts Center for Health Information and Analysis ("CHIA") reports that Partners HealthCare's patient panel represents 19% of all discharges in the Commonwealth.[4] The system's case mix adjusted discharge rate is 22%.[5]

Between FY 16 and FY18, Partners HealthCare saw an increase in the number of patients it serves across all age cohorts between. Current age demographics show that the majority of the patients within Partners HealthCare's patient population are between the ages of 18-64 years of age (61.7-62.1% of the total patient population). Patients that are 65 and older also make up a significant portion of the total patient population (26.1-27.8% of the total patient population). Only 10.4-11.9% of Partners HealthCare's patients are between 0-17 years of age. Preliminary data for FY19 shows similar trends with regard to increases across age cohorts and cohort distribution.

Partners HealthCare's patient panel reflects a mix of races. Data based on patient self-reporting demonstrate that in FY18, 72.0% of the total patient population identified as White; 5.5% identified as African American or Black; 4.1% identified as Asian; 1.5% identified as Hispanic/Latino; 0.1% identified as American Indian or Alaska Native; and 0.1% identified as Native Hawaiian or Other Pacific Islander. Since patients were grouped into these categories based on how they self-identified,[6] there is a portion of the patient population (16.8% in FY18) that either chose not to report their race or identified as a race that did not align with the aforementioned categories. Therefore, it is important to note that the racial composition of Partners HealthCare's patient panel may be understated.

Partners HealthCare provides care to patients from a broad range of geographies including all fifty states. While Partners HealthCare's patient panel resides mainly in Eastern Massachusetts, there is a sizeable portion of the patient panel that resides outside of Massachusetts (10.3%, or 155,302 patients, in FY18). By applying the Department of Public Health's ("DPH") Health Service Area ("HSA") categories to FY18 data, 43.6% of Partners HealthCare's patients reside in HSA 4 (654,363 patients); 16.3% reside in HSA 6 (244,578 patients); 13.6% reside in HSA 5 (204,213 patients); 6.4% reside in HSA 3 (95,780 patients); 3.3% reside in HSA 2 (49,077 patients); 6.1% reside in HSA 1 (90,977 patients); 0.01% reside in MA but outside of HSAs 1-6 (45 patients); and the origin of 6,335 patients or 0.5% of the panel is unknown.

Unit, Home Hospital programs for GH and BWH, Stay Connected with GH, Lifeline, and CareSage programs are not included); Brigham and Women's Physicians Organization, Massachusetts General Physicians Organization, Newton-Wellesley Medical Group, and North Shore Physicians Group; Cooley Dickinson PHO (post-Epic data only); and Partners Community Physicians Organization (pre-Epic non-risk patients not included).

[4] *Fiscal Year 2015: Partners HealthCare System*, MASSACHUSETTS CTR. FOR HEALTH INFORMATION ANALYSIS, http://www.chiamass.gov/assets/docs/r/hospital-profiles/2015/Partners-HealthCare-System.pdf (last visited Mar. 29, 2019).

[5] *Id.*

[6] With the exception of the category "Hispanic/Latino," the race categories shown above are based on the 1997 Office of Management and Budget standards on race and ethnicity. Patients were grouped into these categories based on their responses as follows – White: "White"; African American or Black: "African American", "Black", "Black or African American"; American Indian or Alaska Native: "American Indian", "American Indian or Alaska Native"; Asian: "Asian"; Native Hawaiian or Other Pacific Islander: "Native Hawaiian or Other Pacific Islander", "Native Hawaiian/Other Pacific Islander", "Pacific Islander"; Hispanic/Latino: "Hispanic"," Hispanic or Latino"," Latino"; Other/Unknown: All other responses.

B. Massachusetts General Hospital Patient Panel

Massachusetts General Hospital ("MGH") is one of the founding members of Partners HealthCare and the original teaching hospital of Harvard Medical School. With 1,035 licensed beds at its main campus in Boston, MGH is the largest hospital in the state. In addition to its main hospital campus in Boston, MGH offers services to patients through various hospital satellite and clinic locations across Eastern Massachusetts.

Overall Patient Panel

Attachment 2 provides the demographic profile for MGH in table form. Similar to Partners HealthCare, the number of patients utilizing MGH increased from FY16-FY18 and in FY19-year-to-date ("YTD"), with 563,470 unique patients in FY16, 563,976 unique patients in FY17, and 566,357 unique patients in FY18. In the first six week of FY19, MGH had 149,595 unique patients. Of these patients, approximately 44% are male and 56% are female.

In regard to age, the majority of MGH's patients are between the ages of 18-64 (59.3%, or 335,741 patients in FY18). The next largest age cohort is patients that are 65 years and older (26.4%, or 149,588 patients, in FY18). Subsequently, 14.3% of MGH's patients are between ages 0-17 (81,023 patients in FY18).

Moreover, MGH's patients reflect a diversity of races. Data based on patient self-reporting demonstrate that in FY18, 73.0% of patients identified as White; 5.2% identified as African American or Black; 5.2 identified as Asian; 0.8% identified as Hispanic/Latino; 0.1% identified as American Indian or Alaska Native; and 0.1% identified as Native Hawaiian or Other Pacific Islander. Since patients were grouped into these categories based on how they self-identified,[7] there is a portion of the patient population (15.7% in FY18) that either chose to not report their race or identified as a race that did not align with the above categories. Therefore, it is important to note that the racial composition of MGH's patients may be understated.

Finally, aggregated zip code data by HSA for FY18 demonstrate that MGH's patient population has a similar geographic composition to the larger Partners HealthCare patient panel. These data indicate that 49.2% of MGH's patients resided in HSA 4 (278,900 patients); 17.3% resided in HSA 6 98,075 patients); 8.6% resided in HSA 5 (48,576 patients); 5.8% resided in HSA 3 (32,725 patients); 3.2% resided in HSA 2 (18,211 patients); 1.3% resided in HSA 1 (7,174 patients). Over 79,819 patients or 14.1% of the panel was from outside of Massachusetts, and the origin of 0.5% of the panel was unknown.

EP Service Patient Panel

MGH's Corrigan Minehan Heart Center – Cardiac Arrhythmia Service and Electrophysiology ("EP") Lab were founded nearly thirty years ago. The Cardiac Arrythmia Service treats a wide range of cardiovascular conditions, including arrhythmias, atrial fibrillation and atrial flutter, supraventricular tachycardia, ventricular fibrillation and ventricular tachycardia, brachycardia,

[7] With the exception of the category "Hispanic/Latino", the race categories shown above are based on the 1997 Office of Management and Budget standards on race and ethnicity. Patients were grouped into these categories based on their responses as follows – White: "White"; African American or Black: "African American", "Black", "Black or African American"; American Indian or Alaska Native: "American Indian", "American Indian or Alaska Native"; Asian: "Asian"; Native Hawaiian or Other Pacific Islander: "Native Hawaiian or Other Pacific Islander", "Native Hawaiian/Other Pacific Islander", "Pacific Islander"; Hispanic/Latino: "Hispanic"," Hispanic or Latino"," Latino"; Other/Unknown: All other responses.

sick sinus syndrome, and genetic cardiac conditions, such as Long QT Syndrome and Brugada Syndrome. MGH's Cardiac Arrhythmia Service performs a wide variety of procedures to diagnose cardiac arrythmias, including electrocardiograms, echocardiograms, Holter monitoring, tilt table evaluation, and invasive electrophysiology studies. MGH's Cardiac Arrhythmia Service also provides patients with education on antiarrhythmic medications and offers an Arrhythmia Genetics Clinic. Specialists at the Cardiac Arrhythmia Service evaluate and recommend the best treatment plan for patients.

Many of the patients seen by the Cardiac Arrhythmia Service require EP services to help manage arrhythmias, including treatments performed at MGH's EP Lab, such as catheter ablation (cryoablation and radiofrequency ablation), complicated ablation procedures and pulmonary vein isolations, implantable cardioverter defibrillators ("ICDs") and pacemaker insertion, cardiac resynchronization therapy ("CRT") and electrical cardioversion. Consequently, MGH accommodates a high demand for EP services. In FY16, MGH treated 1,871 unique patients (2,625 visits) for EP services. This number increased to 2,390 unique patients (3,121 visits) in FY17 and rose again to 2,980 unique patients (3,606 visits) in FY18.[8] For the first six weeks of FY19, 825 unique patients (883 visits) had EP procedures.

Aggregated zip code data by HSA for the last three fiscal years demonstrate that MGH's EP patient population has a similar geographic composition to the larger Partners HealthCare patient panel. These data indicate that in FY18 43% (1,272 patients) of MGH's EP patients resided in HSA 4; 18% resided in HSA 6 (550 patients); 11% resided in HSA 5 (323 patients); 7% resided in HSA 3 (216 patients); 4% resided in HSA 2 (119 patients); 1% resided in HSA 1 (33 patients); and 454 patients or 15% of the panel in FY18 was from outside of Massachusetts.

With respect to age, 62% of patients that used MGH's EP service in FY18 were over the age of 65 while 38% of patients were between the ages of 18-64. Of the 825 patients treated by MGH's EP service in the first quarter of FY19, 67% of patients were age 65 or older and 33% were between the ages of 18-64. These data reflect similar patterns in patient trends in FY16 and FY17.

Patients that utilize MGH's EP services also represent diverse races. Data based on patient self-reporting demonstrate that in FY18, 88% of MGH's EP patients identified as White; 3% identified as African American or Black; and 2% identified as Asian. Patients were grouped into these categories based on how they self-identified;[9] as such, there is a portion of the patient population (7% in FY18) that either chose to not report their race or identified as a race that did not align with the above categories. Therefore, it is important to note that the racial composition of MGH's EP patients may be understated.

The gender breakdown for patients that utilized MGH's EP service is as follows: in FY18, 66% of the EP service's patients were male, while 34% were female. Patients were categorized as

[8] The growth increase that occurred from FY16 to FY17 resulted from new leadership of the EP Lab as well as physician recruitment and expanded service hours.

[9] With the exception of the category "Hispanic/Latino", the race categories shown above are based on the 1997 Office of Management and Budget standards on race and ethnicity. Patients were grouped into these categories based on their responses as follows – White: "White"; African American or Black: "African American", "Black", "Black or African American"; American Indian or Alaska Native: "American Indian", "American Indian or Alaska Native"; Asian: "Asian"; Native Hawaiian or Other Pacific Islander: "Native Hawaiian or Other Pacific Islander", "Native Hawaiian/Other Pacific Islander", "Pacific Islander"; Hispanic/Latino: "Hispanic"," Hispanic or Latino"," Latino"; Other/Unknown: All other responses.

male or female based on self-identification, and 0% identified as other. This ratio of male to female patients is similar to historical data from FY16 and FY17.

In a review of underlying conditions associated with EP services at MGH for the last three fiscal years and the first quarter of FY2019, the most prevalent diagnoses were: (1) Persistent Atrial Fibrillation; (2) Paroxysmal Atrial Fibrillation; (3) Supraventricular Tachycardia; (4) Sick Sinus Syndrome; (5) Unspecified Atrial Fibrillation; (6) Typical Atrial Flutter; (7) Ventricular Tachycardia; (8) Atrioventricular Block, Complete; (9) Syncope And Collapse; (10) Atypical Atrial Flutter; and (11) Other. The breakdown of patients with each of these conditions may be found in Attachment 2.

F1.a.ii **Need by Patient Panel:**

Provide supporting data to demonstrate the need for the Proposed Project. Such data should demonstrate the disease burden, behavioral risk factors, acuity mix, health disparities, or other objective Patient Panel measures as noted in your response to Question F1.a.i that demonstrates the need that the Proposed Project is attempting to address. If an inequity or disparity is not identified as relating to the Proposed Project, provide information justifying the need. In your description of Need, consider the principles underlying Public Health Value (see instructions) and ensure that Need is addressed in that context as well.

A. Need for Increased Availability of EP Services

The Necessity of Additional Treatment Space to Accommodate Current and Future Demand for EP Services

MGH's EP Lab needs to be renovated and expanded to address existing physical plant constraints. The original lab was designed thirty years ago and the demand for services, surgical intervention methodologies and care processes for patients have substantially changed over time. MGH's EP Lab is comprised of three rooms, including two rooms to perform cardiac ablations and one room for implantable devices. There is a single recovery bay for the three procedure rooms. The small number of rooms within the facility presents challenges to meet current demand in a timely manner. Moreover, the current lay-out of this space creates capacity constraints leading to operational inefficiencies. The EP Lab has very limited pre- and post-procedure space, hampering throughput and causing delays, which frequently lead to overcrowding and necessitate the transfer of patients to the inpatient setting for recovery services. These inefficiencies lead to longer lengths of stay, constrained discharge processes and dissatisfaction by patients with their overall care experience. Furthermore, the lack of accessible space often requires overflow equipment to be located in hallways, which disrupts patient flow, leading to further inefficiencies. Storing inventory for procedures also is a challenge with limited areas for supplies.

Increased Need for EP Services Associated with an Aging Patient Panel

Cardiac arrhythmias are a major source of morbidity and mortality and cause more than a quarter of a million deaths annually in the US alone.[10] The American Heart Association

[10] Christine Albert et al, *The Future of Arrhythmias and Electrophysiology*, 133 CIRCULATION 25, 2687.

estimates that more than 4 million Americans suffer from recurrent arrhythmias.[11] The most common arrythmia or irregular heart beat is atrial fibrillation ("a-fib").[12] Current estimates indicate that 2.7-6.1 million individuals in the US have a-fib with this number expected to increase substantially as the "Baby Boomer" generation ages into the 65+ age cohort.[13] Advancing age is one of the greatest risk factors for a-fib, with 9% of adults in the 65+ age cohort diagnosed with this condition; in contrast, 2% of adults under the age of 65 are diagnosed with a-fib.[14] Given an increase in the 65+ age cohort across the United States projected estimates indicate that 24-30 million individuals may be diagnosed with a-fib by 2050.[15]

Furthermore, the Centers for Disease Control ("CDC") and Prevention have found that "a-fib increases a person's risk for stroke by four to five times compared with stroke risk for people who do not have a-fib. Strokes caused by complications from a-fib tend to be more severe than strokes with other underlying causes. A-fib causes 15%–20% of ischemic strokes. Consequently, a-fib accounts for approximately 750,000 hospitalizations and 130,000 stroke deaths per year."[16]

According to the University of Massachusetts' Donahue Institute's ("UMDI") *Long-Term Population Projections for Massachusetts Regions and Municipalities*, the statewide population is projected to grow a total of 11.8% from 2010 through 2035.[17] An analysis of UMDI's projections shows that the growth of the Commonwealth's population is segmented by age sector, and that within the next 20 years, the bulk of the state's population growth will cluster around residents that are age fifty (50) and older.[18] Moreover, between 2015 and 2035, the Commonwealth's 65+ population is expected to increase at a higher rate compared to all other age cohorts.[19] By 2035, the 65+ age cohort will represent approximately a quarter of the Massachusetts population.[20] As the number of patients that fall into the 65+ age cohort for MGH and continues to grow, the demand for EP services is expected to increase because age is one of the largest risk factors for arrythmias.

Currently, patients in the 65+ age cohort account for approximately two-thirds of the EP services

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[11] Emelia J. Benjamin et al, *Heart Disease and Stroke Statistics – 2017 Update: A Report From the American Heart Association,* 135 CIRCULATION 10, e146 (Mar. 7, 2017).
[12] Shailee Shah et al., *Recurrent Atrial Fibrillation After Initial Long-Term Ablation Success,* 11 Circulation 4 (Apr. 2018).
[13] *Atrial Fibrillation Fact Sheet,* CTRS. FOR DISEASE CONTROL AND PREVENTION, https://www.cdc.gov/dhdsp/data_statistics/fact_sheets/fs_atrial_fibrillation.htm (last reviewed Aug. 22, 2017).
[14] *Id.*
[15] Albert, *supra* note 10 (*citing* Dariush Mozaffarian et al., *Heart disease and stroke statistics–2015 Update: A Report From the American Heart Association*, 131 Circulation e29 (2015)).
[16] *Atrial Fibrillation Fact Sheet, supra* note 13.
[17] LONG-TERM POPULATION PROJECTIONS FOR MASSACHUSETTS REGIONS AND MUNICIPALITIES, UNIVERSITY OF MASSACHUSETTS DONAHUE INSTITUTE 11 (Mar. 2015), *available at* http://pep.donahue-institute.org/downloads/2015/new/UMDI_LongTermPopulationProjectionsReport_2015%2004%20_29.pdf. The Massachusetts Secretary of the Commonwealth contracted with the University of Massachusetts Donahue Institute (UMDI) to produce population projections by age and sex for all 351 municipalities. *Id.* at 7. Within the past five years, Massachusetts has been experiencing an increase in the population growth rate per year due to high immigration and low domestic outflow, which is expected to slow down in 2030. *Id.* at 12.
[18] *Massachusetts Population Projections – EXCEL Age/Sex Details*, UNIVERSITY OF MASSACHUSETTS DONAHUE INSTITUTE (2015), http://pep.donahue-institute.org/downloads/2015/Age_Sex_Details_UMDI_V2015.xls. This data has been extracted for counties where current Partners HealthCare hospitals and affiliates are located. *Id.*
[19] UNIVERSITY OF MASSACHUSETTS DONAHUE INSTITUTE, *supra* note 17, at 14. The report uses the cohorts as defined by the U.S. Census Bureau 2010 Census Summary, which are 0-19, 20-39, 40-64, and 65+. *Id.* Figure 2.5 in the report demonstrates that where the 65+ cohort increases from 2015 to 2035, all other cohorts are predicted to decrease. *Id.*
[20] *Id.*

provided at MGH. Given projected increases in the overall population and the current growth trends experienced by the Cardia Arrhythmia Service, MGH must prepare its facilities to provide EP services to a greater number of patients in the coming years. With the existing service operating at full capacity, MGH is unable to accommodate additional volume in its EP Lab at this time due to space constraints, and therefore wait times for these services are increasing with some patients waiting five to six weeks for procedures. The proposed expansion of the EP Lab will allow MGH to increase access to these critically needed services and also allow the Hospital to meet future demand. Moreover, renovations to MGH's EP Lab will allow the Hospital to provide services in a more efficient manner, creating greater throughput and increasing the overall number of patients who will benefit from these services.

Current and Projected Demand for EP Services

As discussed, MGH's physical plant constraints impact the hospital's ability to meet current demand for EP services. Overall, MGH's cardiologists and associated staff provide care to patients through approximately 55,000 office visits and 5,000 inpatient admissions annually. EP specialists perform an average of 3,000 EP Lab procedures. Table 1 outlines historical EP service volume by procedure.

Table 1: EP Service Volume by Procedure

	FY13	FY14	FY15	FY16	FY17
Ablations	569	599	601	652	770
Devices	991	1,012	1,075	1,030	1,221
Miscellaneous	898	867	974	943	1,130
TOTAL	**2,458**	**2,478**	**2,650**	**2,625**	**3,121**

These data provide that EP service volume has increased over time with the exception of FY15-16. Due to this slight decrease in volume in FY15-FY16, new leadership within the Cardiac Arrythmia Service sought to expand physician recruitment efforts, as well as hours of operation for the EP Lab. These efforts were successful as EP procedures increased 19% from FY16-FY17. However, given the aforementioned physical plant challenges, as well as the increased demand for EP Lab services, the EP Lab is operating at full capacity. These factors have led to longer wait times for EP services, particularly for patients in need of complicated ablation surgeries. The current wait time for EP services is 5-6 weeks.

To address space constraints and ensure that the hospital will be able to meet both current and future demand, MGH plans to fully renovate its existing EP Lab and expand into adjacent areas currently used as administrative offices and waiting rooms. This renovation and expansion will allow MGH to add two additional procedure rooms (increasing capacity from three to five rooms), as well as nine additional recovery bays (increasing capacity from one to ten recovery bays). The Proposed Project will allow MGH to meet both current and future demand. Volume projections for the renovated EP Lab are outlined in Table 2.

Table 2: Five-Year Volume Projections for EP Services by Procedure

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Ablations	770	838	962	1,087	1,212	1,271
Devices	1,221	1,221	1,221	1,221	1,221	1,221
Misc.EP Services	1,071	1,071	1,071	1,071	1,071	1,071
TOTAL	**3,062**	**3,130**	**3,254**	**3,379**	**3,504**	**3,563**

As shown in Table 2, Year 0 reflects the first 12 months of the procedural space renovation, during which time, the EP Lab will maintain its current volume at maximum capacity. At the end of Year 0, the new procedure rooms will be partially open allowing for ablation growth to ramp up over a four year period, reaching full growth potential by the end of Year 4. Year 5 reflects the first year at full growth post-construction of the procedure rooms and recovery bays.

Volume projections also take into account that MGH treats a subset of ablation cases that are considered medically complicated. These cases must be performed at a tertiary medical facility as patients undergoing such procedures require immediate access to onsite cardiac surgery in the event additional intervention is required. Due to the risks associated with these procedures, these cases cannot be moved to another setting.

F1.a.iii **Competition:**

Provide evidence that the Proposed Project will compete on the basis of price, total medical expenses, provider costs, and other recognized measures of health care spending. When responding to this question, please consider Factor 4, Financial Feasibility and Reasonableness of Costs.

The Proposed Project will not have an adverse effect on competition in the Massachusetts healthcare market based on price, TME, provider costs or other recognized measures of health care spending for numerous reasons. First, in regard to expanded EP services, the ability of more individuals to access these services in a timely manner and control their arrhythmias through the noted EP procedures, such as ablations, will reduce overall healthcare spending. It is well documented that the most common arrhythmia, a-fib, is associated with considerable morbidity, mortality and cost.[21] This condition is a frequently encountered rhythm disorder, characterized by high recurrence rate, frequent hospitalizations, reduced quality-of-life and increased risk of mortality, heart failure and stroke.[22] Along with these clinical complications, this type of arrhythmia is a major driver of health-related expenditures. The Centers for Disease Control and Prevention ("CDC") report that a-fib costs in the United States total approximately $6 billion each year.[23] Additionally, medical costs for people who have a-fib are $8,705 higher per year than for people who do not have a-fib.[24] Consequently, the ability to control a patient's a-fib through EP services will reduce the overall cost of care per patient, as patients who undergo these procedures have "significantly fewer deaths, hospitalizations and emergency

[21] A.Y. Chang et al., *Evaluating the Cost-effectiveness of Catheter Ablation of Atrial Fibrillation*, 3 ARRHYTHMIA & ELECTROPHYSIOLOGY REVIEW 3, 177-83 (2014).
[22] G. Kudaiberdieva et al., *Cost-Effectiveness of Atrial Fibrillation Ablation*, 6 JOURNAL OF ATRIAL FIBRILLATION 1, 880 (2013).
[23] *Atrial Fibrillation Fact Sheet, supra* note 13.
[24] *Id.*

rooms visits for worsening heart failure."[25] Reduced rates of emergency department visits and hospitalizations lead to decreased healthcare spending per patient within the Massachusetts health care market. Moreover, patients with arrhythmias that have ablations or other procedures to address their condition tend to use less or no antiarrhythmic medications, leading to less pharmaceutical costs for payers and lower medication co-pays for patients. These decreased costs lead to an overall reduction in TME for these patients.

Second, renovation and expansion of the EP service will allow MGH to address physical plant needs that are causing operational inefficiencies. The renovation of the EP Lab will allow for the creation of pre- and post-procedure space that will ensure greater patient throughput. The expansion from one to ten recovery bays will eliminate the need for patients to be transferred to the inpatient setting for recovery services, thereby reducing lengths of stay and ensuring timely discharge processes. Moreover, the EP service expansion will reduce wait times, and ensure efficient and timely care on the day of an appointment. Reducing operational inefficiencies will lead to lower operational overhead. This reduction in overhead will lead to lower health care spending and a reduction in TME. Accordingly, the Proposed Project will have no negative impact on competition within the Massachusetts healthcare market.

F1.b.i **Public Health Value /Evidence-Based:**
Provide information on the evidence-base for the Proposed Project. That is, how does the Proposed Project address the Need that Applicant has identified.

A. MGH's Proposed EP Expansion

MGH's proposed expansion of its physical space to accommodate EP services is supported by extensive literature related to evidence-base strategies for addressing arrhythmias.

Use of EP Studies as Diagnostic Tools

EP studies are valuable diagnostic tools that offer a variety of information regarding a patient's heart function. An EP study is an invasive procedure that is designed to allow physicians to examine the heart's electrical activity to determine the cause of an arrhythmia.[26] Electrode catheters are inserted into the patient's artery or vein and guided to the heart.[27] The catheters can detect the heart's electrical signals.[28] The physician may also use the catheters to stimulate the heart, making the heart beat at different speeds inducing arrhythmias. An EP study can take 1-4 hours to complete and requires a recovery period during which time the patient is monitored by a clinician following the procedure.[29]

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[25] Daniel Allar, *Ablation reduces deaths, hospitalizations for patients with AFib, heart failure,* CARDIOVASCULAR BUSINESS (Feb. 1, 2018), https://www.cardiovascularbusiness.com/topics/electrophysiology-arrhythmia/ablation-reduces-deaths-hospitalizations-patients-afib-heart.
[26] *Electrophysiology Studies (EPS),* AM. HEART ASSOCIATION, https://www.heart.org/en/health-topics/arrhythmia/symptoms-diagnosis--monitoring-of-arrhythmia/electrophysiology-studies-eps?s=q%253Dep%252520study%2526sort%253Drelevancy (last reviewed Sept. 30, 2016). *See also Cardiac Arrhythmia Service,* MASSACHUSETTS GENERAL HOSPITAL CORRIGAN MINEHAN HEART CENTER, https://www.massgeneral.org/heartcenter/services/treatmentprograms.aspx?id=1001&display=overview 2018.
[27] *Id. See also Electrophysiology (EP) Study,* MASSACHUSETTS GENERAL HOSPITAL CORRIGAN MINEHAN HEART CENTER, https://www.massgeneral.org/heartcenter/services/procedure.aspx?id=2190 (last visited Apr. 1, 2019).
[28] *Id.*
[29] *Id.*

The findings of an EP study are used to determine the best course of treatment for an arrhythmia. In some cases, catheter ablation may be used to effectively treat an arrhythmia. The purpose of catheter ablation is to eliminate the area causing the arrhythmia by ablating electrical connections within the heart.[30] This prevents abnormal electrical activity in the heart from triggering an arrhythmia.[31] In other instances, an EP specialist may determine that an implantable device may be the best method to treat an arrhythmia. This would result in the patient receiving a pacemaker or other implantable cardioverter defibrillator to correct the arrhythmia.[32] Finally, in other cases, antiarrhythmic medication management may be possible to treat a cardiac arrhythmia. By analyzing the findings of the EP study, physicians are equipped with specific information regarding the heart's functioning to develop an appropriate treatment plan for a patient.

Use of Ablation and Implantable Devices

Catheter ablation is an effective method for treating specific arrhythmias, including a-fib.[33] There has been an increase in the use of cardiac ablations to treat a-fib. One study conducted between 2003 and 2012 found that the incidence of cardiac ablation to treat a-fib increased by seven-fold during this time.[34] Another study found that the number of patients receiving cardiac ablations to treat a-fib and other arrhythmias doubled between 2003 and 2006 when compared to the 1995 to 2002 time period.[35] Cardiac ablation is an effective intervention to treat numerous forms of arrhythmias, leading to improved clinical outcomes compared to medication intervention.[36]

Implantable cardiac devices also are effective in the treatment of a variety of cardiac conditions. This includes devices, such as pacemakers and implantable cardioverter defibrillators. Pacemakers assist a patient when aging or heart disease has inhibited their sinus node's ability to set the correct pace for their heartbeat. Such damage can cause slower than normal heartbeats or long pauses between heartbeats..[37] Pacemakers and cardiac defibrillators that allow for cardiac resynchronization to treat arrhythmias reduce the risk of heart failure and death.[38] Implantable devices improve rates of survival along with other benefits, such as improved quality of life.[39] Implantable cardiac devices also are effective at treating arrhythmias, with proven benefits to patients demonstrated in reduced mortality rates.

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[30] *Catheter Ablation for the Treatment of Atrial Fibrillation*, MASSACHUSETTS GENERAL HOSPITAL CORRIGAN MINEHAN HEART CENTER, https://www.massgeneral.org/heartcenter/services/procedure.aspx?id=2191 (last visited Apr. 1, 2019). *See also Electrophysiology Studies (EPS), supra* note 26.
[31] *Catheter Ablation for the Treatment of Atrial Fibrillation, supra.*
[32] *Id. See also Electrophysiology Studies (EPS), supra* note 26.
[33] Albert, *supra* note 10.
[34] Meytal Avgil Tsadok et al, *Temporal trends and sex differences in pulmonary vein isolation for patients with atrial fibrillation,* 12 HEART RHYTHM 9, 1979 (2017).
[35] Riccardo Cappato et al, *Updated Worldwide Survey on the Methods, Efficacy, and Safety of Catheter Ablation for Human Atrial Fibrillation,* 3 ARRHYTHMIA AND ELECTROPHYSIOLOGY 1, 32 (2009).
[36] Oussama Wazni et al, *Radiofrequency Ablation vs Antiarrhythmic Drugs as First-line Treatment of Symptomatic Atrial Fibrillation: A Randomized Trial,* 293 JAMA 21, 2634 (2005).
[37] Michele Brignole et al, *Assessment of Atrioventricular Junction Ablation and VVIR Pacemaker Versus Pharmacological Treatment in Patients with Heart Failure and Chronic Atrial Fibrillation,* 198 CIRCULATION 98,953-960 (Sept. 8, 1998).
[38] Michael Bristow et al, *Cardiac-Resynchronization Therapy with or without an Implantable Defibrillator in Advanced Chronic Heart Failure,* 350 N. ENGL. J. MED. 2140 (2004).
[39] *Id.*

F.1.b.ii **Public Health Value /Outcome-Oriented:**
Describe the impact of the Proposed Project and how the Applicant will assess such impact. Provide projections demonstrating how the Proposed Project will improve health outcomes, quality of life, or health equity. Only measures that can be tracked and reported over time should be utilized.

A. Expansion of EP Services at MGH's Main Campus: Improving Health Outcomes and Quality of Life

MGH anticipates that the Proposed Project will provide its patients with improved health outcomes, improved quality of life and additional access to high quality EP services by expanding capacity at its main campus. As more fully discussed in Factor F.1.b.i., the expansion of EP services, including the expansion renovations of the EP Lab, will offer patients improved access to treatment options for arrhythmias, through reduced wait times for procedures and thereby fewer complications associated with extended periods of irregular heart rates. Furthermore, patients with arrhythmias, specifically those patients with a-fib, who maintain sinus rhythm after an ablation procedure have a significant improvement in symptoms and overall quality of life due to fewer emergency room visits and hospitalizations, less psychological stress that is often associated with arrhythmias and an ability to do more in their daily lives.[40] Catheter ablation is also more effective at improving depression, anxiety, and quality of life in patients with a-fib as compared to antiarrhythmic drug therapy. Accordingly, additional access to these high quality EP services will improve the quality of life for patients.

The expansion of MGH's EP Lab will also impact patient experience. Current physical plant constraints cause overcrowding in the pre- and post-procedure areas of the lab, thereby impacting patient privacy and satisfaction. Frequently, patients are transferred to the inpatient setting for recovery services (to avoid overcrowding) causing longer lengths of stay and constrained discharge processes. Through the Proposed Project, MGH will be able to address the space constraints that are creating operational inefficiencies, leading to better patient experience and ensuring greater levels of satisfaction.

B. Additional Strategies for Improving Patient Experience and Ensuring High Quality Outcomes for All Services at MGH

The Applicant and MGH are committed to developing and implementing population health management ("PHM") strategies to ensure high quality outcomes and an exceptional care experience for all patients. Currently, MGH is in the midst of a ten-year strategic plan aimed at improving patient experience and clinical quality outcomes, as well as reducing the costs associated with care. Every clinical department at MGH, including cardiology, has a PHM strategy. These strategies are aimed at improving quality, efficiency and patient experience, such as care models that are rooted in collaboration, including patient-centered medical homes, care integration and other care initiatives specifically designed by MGH clinicians. Consequently, MGH offers a number of programs to ensure quality care for patients.

First, MGH staff participate in the eConsult Program. Through the eConsult program, PCPs and specialists, such as cardiologists, consult (as needed) through a non-face-to-face electronic interaction that seeks to ensure patients receive appropriate services, while avoiding any unnecessary higher cost consultations. Through this program, primary care physicians ("PCPs")

[40] Daniel Raine et al, *Effect of catheter ablation on quality of life in patients with atrial fibrillation and its correlation with arrhythmia outcome,* 2 OPENHEART 1 (July 2015).

initiate an eConsult order through the hospital's electronic health record ("EHR"). For cardiology patients, within three business days, a PCP will be provided with structured guidance from a cardiologist on a particular question about a specific patient. Cardiology consultations were the first program offered via the eConsult program and EP related issues are a substantial portion of the questions asked by PCPs. Through this program, clinical decision support in the EHR and physician-level variation reporting minimize inappropriate ordering of radiology and other high-cost diagnostic tests by a PCP and ensure patients receive the right care.

Second, for MGH's highest risk and most complex patients, clinical staff offer the Integrated Care Management program ("iCMP"). iCMP provides eligible patients with a care manager who develops a care plan in collaboration with the patient and other members of the clinical team. The care manager works in-person and telephonically to coordinate a patient's care to reduce hospital readmissions when possible. Additionally, the care manager connects patients with community-based resources that facilitate recovery. MGH also offers the Patients Linked to Urgent Supports ("PLUS"). This program provides intensive wrap-around services (psycho-social supports) to a small number of patients. Services include acute community paramedicine, crisis stabilization units, and coordinated transportation. All of these programs work to assure that MGH's patients have the highest quality care coordination along the care continuum and reduced health care costs.

Third, MGH offers alternative care pathways to patients, so they may avoid unnecessary visits to the emergency department or inpatient hospitalizations. The Partners Mobile Observation Unit ("PMOU") is a program that provides home-based urgent care for patients experiencing at-risk medical events that can be addressed with enhanced home care. Additionally, MGH's Home Hospital Program offers daily hospital-level care at home through team-based care.

Through the Proposed Project, the expand EP services will offer these programs to patients, thereby ensuring improved quality outcomes for patients and overall patient experience. For all patients access to these critically needed services will allow them to receive appropriate and timely care, as well as address any social determinant of health challenges. By providing access to these PHM strategies, MGH provides holistic care, which in turn ensures higher quality outcomes, satisfaction, and continuity for patients.

C. Assessing the Impact of the Proposed Project

To assess the impact of the Proposed Project, MGH has developed the following quality metrics and reporting schematic, as well as metric projections for quality indicators that will measure patient satisfaction, access and quality of care. The measures are discussed below:

Expanded EP Services

1. **Satisfaction – Patient Satisfaction:** Patients that are satisfied with care are more likely to seek additional treatment when necessary. MGH staff will review overall ratings of care for cardiology services via Press Ganey Survey scores.

   Measure: Overall rating of Care – Response Options, include: Very Good, Good, Fair, Poor and Very Poor.

   Projections:
   a. Helpfulness of Registration Person: Baseline: 91.9; Year 1: 92.9; Year 2: 93.9; and Year 3: 94.9

b. Ease of Registration Process: Baseline: 94.6; Year 1: 95.6; Year 2: 96.6; and Year 3: 97.6
c. Waiting Time in Registration: Baseline: 87.6; Year 1: 88.6; Year 2: 89.6; and Year 3: 90.6
d. Comfort of Waiting Area: Baseline: 86.1; Year 1: 87.1; Year 2: 88.1; and Year 3: 89.1
e. Ease of Finding Your Way Around: Baseline: 87.6; Year 1: 88.6; Year 2: 89.6; and Year 3: 90.6
f. Cleanliness of Facility: Baseline: 92.8; Year 1: 93.8; Year 2: 94.8; and Year 3: 95.8
g. Our Concern for Privacy: Baseline: 94.6; Year 1: 95.6; Year 2: 96.6; and Year 3: 97.6

Monitoring: Any category receiving a less than "Good" rating will be evaluated and policy changes instituted as deemed appropriate.

2. **Access – Wait Times:** The number of days from the date that an EP procedure is indicated to the scheduled EP procedure date. This information will be obtained via MGH's EHR system, EPIC.

   Measure: Time interval from when the case was initiated for scheduling in Epic to the date of the EP procedure.

   Projections: Baseline: 6 weeks; Year 1: 5 weeks; Year 2: 4 weeks; and Year 3: 3 weeks.

   Monitoring: Reviewed quarterly by clinical staff.

3. **Clinical Quality – Patient radiation dose during fluoroscopy guided procedures:** This measure evaluates the amount of radiation dose a patient receives during a fluoroscopy guided EP procedure. Following the NRC ALARA guideline, every reasonable effort should be made to reduce exposure to ionizing radiation whenever possible.

   Measure: The amount of radiation a patient receives during a fluoroscopy guided EP procedure.

   Projections:
   a. Low Dose Setting Procedures: Baseline: 15 nGy/pulse; Year 1: -60%; Year 2: n/a; and Year 3: n/a[41]
   b. Intermediate Dose Setting Procedures: Baseline: 32 nGy/pulse; Year 1: -62.5%; Year 2: n/a; and Year 3: n/a[42]
   c. High Dose Setting Procedures: Baseline: 45 nGy/pulse; Year 1: -35.5%; Year 2: n/a; and Year 3: n/a[43]

[41] Imaging system upgrades will allow this measure to realize significant improvement in Year 1, but not in subsequent years. At the time of system transition, MGH will determine a similar measure to track and provide data on to the Department of Public Health.
[42] *Id.*
[43] *Id.*

Monitoring: The MGH Radiation Safety Office reports patient-level intraprocedural radiation dose monthly.

F1.b.iii **Public Health Value /Health Equity-Focused:**

For Proposed Projects addressing health inequities identified within the Applicant's description of the Proposed Project's need-base, please justify how the Proposed Project will reduce the health inequity, including the operational components (e.g. culturally competent staffing). For Proposed Projects not specifically addressing a health disparity or inequity, please provide information about specific actions the Applicant is and will take to ensure equal access to the health benefits created by the Proposed Project and how these actions will promote health equity.

To ensure health equity to all patients, including those deemed underserved, the Proposed Project will not affect accessibility of MGH's services for poor, medically indigent, and/or Medicaid eligible individuals. MGH does not discriminate based on ability to pay or payer source and this practice will continue following implementation of the Proposed Project. As further detailed throughout this narrative, the Proposed Project will increase access to high quality EP, services for all patients in a number of ways.

Over the past decade, MGH has launched a variety of diversity initiatives to address healthcare disparities, increase the percentage of employees from underrepresented groups, build trust among people of diverse backgrounds and evaluate the hospital's progress. Given these efforts, MGH was recently named one of the nation's top ten hospitals and health systems on diversity issues by Diversity Inc., a publication that monitors best practices in the field. With these goals and MGH's commitment to increasing the number of employees from underrepresented groups, the hospital's staff represent various races and ethnicities. Through the Proposed Project, patients will have access to culturally competent staffing through a clinical staff representative of various races and ethnicities.

Moreover, Partners HealthCare, and specifically MGH, has also adopted the Culturally and Linguistically Appropriate Service ("CLAS") standards set forth by the U.S. Department of Health and Human Services Office of Minority Health for all practice sites. MGH provides effective, understandable, and respectful care with an understanding of patients' cultural health beliefs and practices and preferred languages. Additionally, MGH has arrangements to offer ongoing education and training in culturally and linguistically appropriate areas for staff at all levels and across all disciplines.

In regard to interpreter services, MGH provides staff interpreters that speak eleven languages, including American Sign Language ("ASL"). Interpretations for encounters that occur at MGH's main campus staff are documented in a centralized Interpreter Services Tracking System, which contains a reporting tool for year-end statistics of positive encounters. MGH staff review the annual statistics and seek ways to improve these services.

Finally, all Partners HealthCare hospitals, including MGH participate in the American Hospital Association's #123Equity Pledge Campaign. This Campaign seeks to eliminate health and health care disparities that exist for racially, ethnically and culturally diverse individuals. The campaign requires hospital leaders to accelerate progress in the following areas: (1) Increasing the collection and use of race, ethnicity, language preference and other socio-demographic data; (2) Increasing cultural competency training; and (3) Increasing diversity in leadership and governance. Currently, all Partners HealthCare hospitals participate in the Campaign. This

Campaign will allow MGH staff to ensure equal access to the benefits created by the Proposed Project.

F1.b.iv Provide additional information to demonstrate that the Proposed Project will result in improved health outcomes and quality of life of the Applicant's existing Patient Panel, while providing reasonable assurances of health equity.

The Proposed Project seeks to expand timely access to EP services. By providing patients with enhanced access to these services, patient wait times for procedures will be reduced. Timely treatment often ensures fewer complications from cardiac conditions, leading to reduced emergency department visits and hospitalizations and improved health outcomes. Moreover, expedited access to care may lead to a reduction in disease/condition-related complications, such as pain, depression and a reduced ability to participate in activities that directly impact a patient's quality of life.

F1.c Provide evidence that the Proposed Project will operate efficiently and effectively by furthering and improving continuity and coordination of care for the Applicant's Patient Panel, including, how the Proposed Project will create or ensure appropriate linkages to patients' primary care services.

To ensure continuity of care, improved health outcomes and quality of life, MGH EP staff will continue existing formal processes for linking patients with their primary care physicians and community cardiologists for follow-up care, as well as case management/social work support to ensure patients have access to resources around social determinant of health ("SDoH") issues. Providing patients with linkages to these necessary services prevents unnecessary readmissions, ensures appropriate care management and provides the patient with the resources for improving underlying issues that impact health. Moreover, patients will benefit from MGH's well-developed PHM strategies, including care coordination and care delivery alternatives aimed at improving patient experience and outcomes.

MGH has a number of integrated care programs in place to ensure continuity of care and care integration. In addition to programs, such as eConsult and Shared Decision-Making, MGH assists patients with linkages to care and SDoH through care managers who follow-up with patients after ambulatory procedures. These care manager's follow-up with patients telephonically to provide medication reconciliation and coordinate care with clinicians to optimize recovery. Moreover, and as discussed, MGH also offers a number of alternatives to emergency department care for patients through PMOU, a program that provides home-based urgent care for patients experiencing at-risk medical events believed to be treatable with enhanced home care. Accordingly, these efforts and initiatives ensure patients are appropriately linked to care integration resources.

F1.d Provide evidence of consultation, both prior to and after the Filing Date, with all Government Agencies with relevant licensure, certification, or other regulatory oversight of the Applicant or the Proposed Project.

Since a broad range of input is valuable in the planning of a project, the Applicant carried out a diverse consultative process with individuals at various regulatory agencies regarding the Proposed Projects. The following individuals are some of those consulted regarding this Project:

- Department of Public Health: Nora Mann, Director, Determination of Need Program; Rebecca Rodman, Deputy General Counsel; and Ben Wood, Director, Office of Community Health Planning and Engagement.
- MassHealth: Steven Sauter, Director, Acute Hospital Program, MassHealth Office of Providers and Plans and David Garbarino, Director of Purchasing Strategy and Analytics at Executive Office of Health and Human Services – MassHealth.

F1.e.i **Process for Determining Need/Evidence of Community Engagement:**
For assistance in responding to this portion of the Application, Applicant is encouraged to review *Community Engagement Standards for Community Health Planning Guideline.* With respect to the existing Patient Panel, please describe the process through which Applicant determined the need for the Proposed Project.

A. Community Engagement on the Expansion of EP Services

Based upon growing demand by MGH's patient panel for EP services, and the physical plant constraints within the existing EP Lab, MGH staff developed a plan to renovate and expand the EP Lab. In contemplation of this expansion, MGH's leadership sought to define its community broadly and engage patients and family members that may be impacted by the Proposed Project to obtain feedback and answer questions. These engagement efforts are described below.

In an effort to ensure appropriate community engagement, the Proposed Project was presented to the Patient and Family Advisory Council ("PFAC") at MGH's Corrigan Minehan Heart Center ("Heart and Vascular PFAC"). This mission of this PFAC is to enhance the patient care experience by ensuring that the voices of patients and families are represented. This unique group is comprised of patients who have been treated at MGH's Corrigan Minehan Heart Center for a broad range of cardiovascular conditions and their family members. During their monthly meetings, members of the Heart and Vascular PFAC hold stimulating discussions with the following goals in mind: 1) To represent patient and family perspectives about the overall patient care experience; 2) To demonstrate the Corrigan Minehan Heart Center's commitment to hearing the voices of patients and families; 3) To work in an advisory role to enhance cardiovascular care at the Corrigan Minehan Heart Center, including identifying patient and family-centered care strategies, reviewing and revising patient education materials, influencing and participating in the education of staff (including physicians, nurses and nurse practitioners) and support staff, acting as a sounding board for the implementation of new Corrigan Minehan Heart Center programs, and improvement of existing programs, and providing input regarding facility design. The input of the Heart and Vascular PFAC makes an important contribution to the ongoing efforts within the Corrigan Minehan Heart Center and helps to continually improve patient care.

On March 6, 2018 surgical staff presented to the Heart and Vascular PFAC on the Proposed Project. Meeting minutes and an agenda for the meeting may be found in Attachment 4a. Overall feedback from the meeting was very positive and supportive of the plan. There were no concerns expressed by this group.

F1.e.ii **Please provide evidence of sound Community Engagement and consultation throughout the development of the Proposed Project. A successful Applicant will, at a minimum, describe the process whereby the "Public Health Value" of the Proposed Project was considered, and will describe the Community Engagement process as it occurred and is occurring currently in, at least, the following contexts: Identification of Patient Panel Need; Design/selection of DoN Project in response to "Patient Panel" need; and Linking the Proposed Project to "Public Health Value".**

To ensure sound community engagement throughout the development of the Proposed Project, the Applicant, in conjunction with MGH, took the following actions:

- Presented to MGH's Heart and Vascular PFAC on March 6, 2018;

For detailed information on these activities, see Attachments 4a and 4b.

For transparency and to educate the community regarding the public health value of the proposed EP Project, MGH developed a presentation to provide at the aforementioned PFAC meeting. This presentation documents the components of the Proposed Project and the patient panel need that the Project will meet, as well as the impact of the proposed Project including its public health value (see Attachment 4b).

Factor 2: Health Priorities

Addresses the impact of the Proposed Project on health more broadly (that is, beyond the Patient Panel) requiring that the Applicant demonstrate that the Proposed Project will meaningfully contribute to the Commonwealth's goals for cost containment, improved public health outcomes, and delivery system transformation.

F2.a. **<u>Cost Containment:</u>**
Using objective data, please describe, for each new or expanded service, how the Proposed Project will meaningfully contribute to the Commonwealth's goals for cost containment.

The goals for cost containment in Massachusetts focus on providing low-cost care alternatives without sacrificing high quality. In fact, the Commonwealth's independent state agency that develops policy to reduce health care cost growth and improve the quality of patient care, the Health Policy Commission, has a stated goal of bettering health and care at a lower cost across the Commonwealth. As described below, the Proposed Project will meaningfully contribute to Massachusetts' goals for cost containment.

The expansion and renovation of the Hospital's EP Lab will afford patients more timely access to treatment. The expedited treatment of arrythmias and other cardiac conditions leads to reduced rates of emergency department visits and hospitalizations, thereby decreasing overall healthcare spending for these patients. With arrythmias, specifically a-fib, the cost of care rises each year without timely access to treatment. Through the Proposed Project Improved access to EP services will help reduce overall health care utilization leading to a reduction in costs. Accordingly, the Proposed Project will lower costs, as well as overall TME and total health care expenditures.

F2.b. **Public Health Outcomes:**
Describe, as relevant, for each new or expanded service, how the Proposed Project will improve public health outcomes.

The expansion of EP services at MGH will improve public health outcomes as patients will have more timely access to life-saving and life-prolonging services. This increased access to EP services through the Proposed Project will allow patients to schedule procedures and therapy appointments in an expedited manner by reducing wait times, ultimately leading to overall better patient care experiences. Moreover, as discussed, studies have documented the benefits of obtaining timely EP services, including lower rates of emergency department visits and hospitalizations, as well as a reduction in disease/condition-related complications that may cause depression and anxiety or impact a patient's quality of life. When patients receive timely care in the appropriate setting and achieve cost savings, patients benefit while achieving the Commonwealth's goals for cost containment.

F2.c. **Delivery System Transformation:**
Because the integration of social services and community-based expertise is central to goal of delivery system transformation, discuss how the needs of their patient panel have been assessed and linkages to social services organizations have been created and how the social determinants of health have been incorporated into care planning.

As outlined in Section F.1.B.ii, MGH has numerous programs in place to ensure linkages to social service organizations, such as through the iCMP for high-risk, chronically ill patients. Additionally, as part of the transition to the MassHealth ACO model of care, the Applicant and MGH have implemented a universal screening program for SDoH. This includes domains such as: housing, food insecurity, finances, childcare, transportation, and literacy. Currently, staff are working to connect patients to internal and external resources if the patient screens positive in any of the SDoH domains.

Factor 5: Relative Merit

F5.a.i **Describe the process of analysis and the conclusion that the Proposed Project, on balance, is superior to alternative and substitute methods for meeting the existing Patient Panel needs as those have been identified by the Applicant pursuant to 105 CMR 100.210(A)(1). When conducting this evaluation and articulating the relative merit determination, Applicant shall take into account, at a minimum, the quality, efficiency, and capital and operating costs of the Proposed Project relative to potential alternatives or substitutes, including alternative evidence-based strategies and public health interventions.**

Proposal: Fully renovate and expand the EP Lab to address physical plant constraints and improve access to EP services for an aging patient panel.

Quality: The Proposed Project is a superior alternative for providing high quality EP services and improving health outcomes for patients treated in the EP Lab. The expansion of EP services will allow patients to receive more timely care for arrhythmias, reducing wait times for procedures and ensuring fewer complications associated with extended periods of irregular heart rates. Furthermore, patients that have access to high quality EP services, such as

catheter ablation show a significant improvement in symptoms and overall quality of life due to fewer emergency room visits and hospitalizations, as well as less psychological stress.

Efficiency: Currently, physical plant constraints cause operational inefficiencies. The EP Lab has very limited pre- and post-procedure space, hampering throughput and causing delays, which frequently lead to overcrowding and necessitate the transfer of patients to the inpatient setting for recovery services. Consequently, the discharge process is constrained, leading to longer lengths of stay and dissatisfaction by patients with their overall care experience. Through the Proposed Project, wait times for procedures will be reduced with the addition of two procedure rooms. Moreover, the Proposed Project will address patient throughput issues by adding nine additional recovery beds, eliminating the need to transfer patients to the inpatient setting for recovery services, leading to reduced lengths of stay and more efficient discharge processes.

Capital Expense: The proposed renovation and expansion of EP services represents a cost effective project as MGH staff have worked with the architects and the design team to implement a cost-effective expansion.

Operating Costs: Maintaining the EP Lab in its current state will continue to present operation inefficiencies, including administrative costs associated with inefficient and ineffective patient throughput. The Proposed Project will eliminate these inefficiencies, leading to stabilized operating costs.

List alternative options for the Proposed Project:

Option 1

Alternative Proposal: Expand the Procedural and Recovery Platform on the 4th floors of Gray Jackson, Gray Bigelow, & Blake Buildings.

Alternative Quality: MGH has excellent quality scores associated with procedural services, as a result, quality outcomes would be the same.

Alternative Efficiency: Building out a general procedural platform may not allow service specific operating or cost efficiencies.

Alternative Capital Expenses: The construction costs associated with this project are approximately $94.7M for 54,540 gross square feet ("GSF") of renovated space. These increased costs are due to necessary infrastructure upgrades that would be required to expand MGH's procedural services in the Gray, Jackson, and Blake buildings above the existing OR platform, as well as multi-phased, extensive timelines. Given the age of these facilities (20-50 years old), the space would require reconfiguration and renovation to incorporate today's technology and team-based model of care. Accordingly, this alternative was deemed not feasible.

Alternative Operating Costs: Operating expenses are impacted by the incorporation of additional technology and to ensure appropriate staffing for a team-based model of care.

Option 2

Alternative Proposal: Relocation and expansion of the EP Lab on the 9th floor of the Blake and Gray Buildings adjacent to the current Cardiovascular Lab.

Alternative Quality: This is not a feasible solution as MGH would lose inpatient capacity and disrupt the Cardiovascular Lab during the major construction period.

Alternative Efficiency: Consolidation of specialized services may not improve operating or cost efficiencies. Loss of inpatient beds with daily census exceeding 90% is not feasible.

Alternative Capital Expenses:. The construction costs associated with this alternative are approximately $62.5M for 32,355 gross square feet ("GSF") of renovated space. These increased costs are due to necessary infrastructure upgrades that would be required to relocate EP services in the Gray and Blake buildings as well as multi-phased extensive timelines. Given the age of these facilities (20-50 years old), the space requires reconfiguration and renovation to incorporate today's technology and team-based model of care. Accordingly, this alternative was deemed not feasible as an option.

Alternative Operating Costs: For this alternative, operating costs are impacted by the various phases of the project and the shifting of services, leading to increased costs. Additionally, operating expenses are impacted by the incorporation of additional technology and to ensure appropriate staffing for a team-based model of care.

EMERGENCY DEPARTMENT RENOVATION AND BEHAVIORAL HEALTH EXPANSION

Factor 1: Applicant Patient Panel Need, Public Health Values and Operational Objectives

F1.a.i **Patient Panel:**
Describe your existing Patient Panel, including incidence or prevalence of disease or behavioral risk factors, acuity mix, noted health disparities, geographic breakdown expressed in zip codes or other appropriate measure, demographics including age, gender and sexual identity, race, ethnicity, socioeconomic status and other priority populations relevant to the Applicant's existing patient panel and payer mix.

A. Partners HealthCare Patient Panel

Partners HealthCare is a not-for-profit, integrated health care system that was formed in 1994 by an affiliation between The Brigham Medical Center, Inc. (now known as Brigham Health) and The Massachusetts General Hospital. Partners HealthCare currently operates two tertiary hospitals, six community acute care hospitals, and one acute care specialty hospital in Massachusetts; one community acute care hospital in Southern New Hampshire; one facility providing inpatient and outpatient mental health services; and three facilities providing inpatient and outpatient services in rehabilitation medicine and long-term care. Partners HealthCare also operates physician organizations and practices, a home health agency, nursing homes and a graduate level program for health professionals. Partners HealthCare is a non-university-based nonprofit private medical research enterprise and its academic medical centers are principal teaching affiliates of the medical and dental schools of Harvard University. Partners HealthCare provides its services to patients primarily from the Greater Boston area and eastern Massachusetts, as well as New England and beyond. Additionally, Partners HealthCare operates a licensed, not-for-profit managed care organization that provides health insurance products to the MassHealth Program (Medicaid), Commonwealth Care (a series of health insurance plans for adults who meet income and other eligibility requirements) and commercial populations.

Partners HealthCare serves a large and diverse patient panel as demonstrated by the utilization data for the 36-month period covering Fiscal Year ("FY") 16-18 and the preliminary data available for FY19.[1] Attachment 2 provides this demographic profile for Partners HealthCare in table form. The number of patients utilizing Partners HealthCare's services has increased[2] since FY16, with 1,377,250 unique patients in FY16, 1,403,853 unique patients in FY17 and 1,500,670 unique patients in FY18.[3] Preliminary data indicate that for the first six week of FY19

[1] Fiscal year October 1 – September 30. While preliminary data is available for FY19, annual comparisons are calculated using data for FY16-18 as the FY19 data is only for the first six weeks of the new fiscal year and will change over time.

[2] The methodology for aggregating Partners HealthCare's patient panel data has evolved into an automated process utilizing internal data resources. Initially, in 2017, when Partners HealthCare began developing its patient panel for Determination of Need applications, such as the Change of Ownership for Massachusetts Eye and Ear and the Substantial Capital Expansion for Brigham and Women's Hospital, staff manually aggregated the necessary data. However, since these submissions, Partners HealthCare staff have developed a new automated process that allows for the collection and amalgamation of system-wide data. This refined methodology allows staff to continuously monitor and improve the way that data are aggregated. Accordingly, between June 2018 and October 2018, staff further refined the data collection processes leading to a decrease of no more than 5% in overall patient counts for the system. Staff will continue to refresh and refine the process for aggregating data across the system, leading to more exact patient panel data.

[3] Entities include: Brigham and Women's Hospital, Brigham and Women's Faulkner Hospital, Massachusetts General Hospital, Newton-Wellesley Hospital, and North Shore Medical Center; Cooley Dickinson Hospital, Martha's Vineyard Hospital, McLean Hospital, and Nantucket Cottage Hospital (post-Epic data only); Massachusetts Eye and Ear Infirmary (outpatient post-Epic data only); Spaulding Rehabilitation Hospital (Telehealth, Partners Mobile Observation

Partners HealthCare had 398,563 unique patients. Partners HealthCare's patient mix consists of approximately 42% males and 58% females. The Massachusetts Center for Health Information and Analysis ("CHIA") reports that Partners HealthCare's patient panel represents 19% of all discharges in the Commonwealth.[4] The system's case mix adjusted discharge rate is 22%.[5]

Partners HealthCare has seen an increase in the number of patients it serves across all age cohorts between FY16 and FY18. Current age demographics show that the majority of the patients within Partners HealthCare's patient population are between the ages of 18-64 years of age (61.7-62.1% of the total patient population). Patients that are 65 and older also make up a significant portion of the total patient population (26.1-27.8% of the total patient population). Only 10.4-11.9% of Partners HealthCare's patients are between 0-17 years of age. Preliminary data for FY19 shows similar trends with regard to increases across age cohorts and cohort distribution.

Partners HealthCare's patient panel reflects a mix of races. Data based on patient self-reporting demonstrate that in FY18, 72.0% of the total patient population identified as White; 5.5% identified as African American or Black; 4.1% identified as Asian; 1.5% identified as Hispanic/Latino; 0.1% identified as American Indian or Alaska Native; and 0.1% identified as Native Hawaiian or Other Pacific Islander. Since patients were grouped into these categories based on how they self-identified,[6] there is a portion of the patient population (16.8% in FY18) that either chose not to report their race or identified as a race that did not align with the aforementioned categories. Therefore, it is important to note that the racial composition of Partners HealthCare's patient panel may be understated.

Partners HealthCare provides care to patients from a broad range of geographies including all fifty states. While Partners HealthCare's patient panel resides mainly in Eastern Massachusetts, there is a sizeable portion of the patient panel that resides outside of Massachusetts (10.3%, or 155,302 patients, in FY18). By applying the Department of Public Health's ("DPH") Health Service Area ("HSA") categories to FY18 data, 43.6% of Partners HealthCare's patients reside in HSA 4 (654,363 patients); 16.3% reside in HSA 6 (244,578 patients); 13.6% reside in HSA 5 (204,213 patients); 6.4% reside in HSA 3 (95,780 patients); 3.3% reside in HSA 2 (49,077 patients); 6.1% reside in HSA 1 (90,977 patients); 0.01% reside in MA but outside of HSAs 1-6 (45 patients); and the origin of 6,335 patients or 0.5% of the panel is unknown.

Unit, Home Hospital programs for GH and BWH, Stay Connected with GH, Lifeline, and CareSage programs are not included); Brigham and Women's Physicians Organization, Massachusetts General Physicians Organization, Newton-Wellesley Medical Group, and North Shore Physicians Group; Cooley Dickinson PHO (post-Epic data only); and Partners Community Physicians Organization (pre-Epic non-risk patients not included).

[4] *Fiscal Year 2015: Partners HealthCare System*, MASSACHUSETTS CTR. FOR HEALTH INFORMATION ANALYSIS, http://www.chiamass.gov/assets/docs/r/hospital-profiles/2015/Partners-HealthCare-System.pdf (last visited Apr. 2, 2019).

[5] *Id.*

[6] With the exception of the category "Hispanic/Latino," the race categories shown above are based on the 1997 Office of Management and Budget standards on race and ethnicity. Patients were grouped into these categories based on their responses as follows – White: "White"; African American or Black: "African American", "Black", "Black or African American"; American Indian or Alaska Native: "American Indian", "American Indian or Alaska Native"; Asian: "Asian"; Native Hawaiian or Other Pacific Islander: "Native Hawaiian or Other Pacific Islander", "Native Hawaiian/Other Pacific Islander", "Pacific Islander"; Hispanic/Latino: "Hispanic"," Hispanic or Latino"," Latino"; Other/Unknown: All other responses.

B. Massachusetts General Hospital Patient Panel

Massachusetts General Hospital ("MGH") is one of the founding members of Partners HealthCare. With 1,035 licensed beds at its main campus in Boston, MGH is the largest hospital in the state. In addition to its main hospital campus in Boston, MGH offers services to patients through various hospital satellite and clinic locations across Eastern Massachusetts.

Overall Patient Panel

Attachment 2 provides the demographic profile for MGH in table form. Similar to Partners HealthCare, the number of patients utilizing MGH increased from FY16-FY18 and in FY19-year-to-date ("YTD"), with 563,470 unique patients in FY16, 563,976 unique patients in FY17, and 566,357 unique patients in FY18. In the first six week of FY19, MGH had 149,595 unique patients. Of these patients, approximately 44% are male and 56% are female.

In regard to age, the majority of MGH's patients are between the ages of 18-64 (59.3%, or 335,741 patients in FY18). The next largest age cohort is patients that are 65 years and older (26.4%, or 149,588 patients, in FY18). Subsequently, 14.3% of MGH's patients are between ages 0-17 (81,023 patients in FY18).

Moreover, MGH's patients reflect a diversity of races. Data based on patient self-reporting demonstrate that in FY18, 73.0% of patients identified as White; 5.2% identified as African American or Black; 5.2 identified as Asian; 0.8% identified as Hispanic/Latino; 0.1% identified as American Indian or Alaska Native; and 0.1% identified as Native Hawaiian or Other Pacific Islander. Since patients were grouped into these categories based on how they self-identified,[7] there is a portion of the patient population (15.7% in FY18) that either chose to not report their race or identified as a race that did not align with the above categories. Therefore, it is important to note that the racial composition of MGH's patients may be understated.

Finally, aggregated zip code data by HSA for FY18 demonstrate that MGH's patient population has a similar geographic composition to the larger Partners HealthCare patient panel. These data indicate that 49.2% of MGH's patients resided in HSA 4 (278,900 patients); 17.3% resided in HSA 6 98,075 patients); 8.6% resided in HSA 5 (48,576 patients); 5.8% resided in HSA 3 (32,725 patients); 3.2% resided in HSA 2 (18,211 patients); 1.3% resided in HSA 1 (7,174 patients).[8] Over 79,819 patients or 14.1% of the panel was from outside of Massachusetts, and the origin of 0.5% of the panel was unknown.

Emergency Department Patient Panel

MGH's Emergency Department ("ED") is a full-service, state-of-the-art facility that is equipped to handle any medical emergency. As a Level I Trauma Center, Level I Pediatric Trauma Center and Level I Burn Center, MGH treats patients with the most critical injuries. In addition, MGH is the local ED for residents of the West End, Beacon Hill, the North End and other parts of

[7] With the exception of the category "Hispanic/Latino", the race categories shown above are based on the 1997 Office of Management and Budget standards on race and ethnicity. Patients were grouped into these categories based on their responses as follows – White: "White"; African American or Black: "African American", "Black", "Black or African American"; American Indian or Alaska Native: "American Indian", "American Indian or Alaska Native"; Asian: "Asian"; Native Hawaiian or Other Pacific Islander: "Native Hawaiian or Other Pacific Islander", "Native Hawaiian/Other Pacific Islander", "Pacific Islander"; Hispanic/Latino: "Hispanic"," Hispanic or Latino"," Latino"; Other/Unknown: All other responses.

[8] 0.004% of MGH/MGPO's patients reside in MA but outside of HSAs 1-6 (22 patients).

downtown Boston. MGH's ED provides exceptional depth of continuous coverage through: (1) robust 24/7 board-certified attending physician presence; (2) a full team of onsite trauma surgeons; (3) dedicated radiologists; (4) an Acute Psychiatric Service ("APS") that treats acute psychiatric and neuropsychiatric emergencies; and (5) dedicated support personnel. Additionally, MGH's ED has the latest technology, such as two new-generation helical CT scanners and one dedicated MRI machine. A full-weather rooftop heliport that allows two helicopters to land at one time. The Hospital also offers access to a hyperbaric chamber located nearby at the Massachusetts Eye and Ear Infirmary.

In addition to addressing demand for all levels of emergency services, MGH is working to improve the future delivery of emergency care by conducting clinical trials and research studies exploring new medicines and technologies, as well as coordinating the Emergency Medicine Network, which advances public health objectives through multicenter, ED-based research. MGH's ED also hosts a variety of medical education courses and conferences for practicing physicians, including an annual pair of symposia on cutting-edge topics in emergency medicine. Finally, the hospital offers training opportunities for fellows and residents in emergency medicine.

MGH accommodates a high demand for emergency medicine services. In FY16, MGH treated 76,503 unique patients (107,577 visits) through its ED. This number slightly decreased[9] to 75,504 unique patients (106,018 visits) in FY17 and rose again to 76,401 unique patients (107,997 visits) in FY18. For the first quarter of FY19, 22,344 unique patients (26,738 visits) received treatment through MGH's ED.

Aggregated zip code data by HSA for the last three fiscal years demonstrate that MGH's ED patient population has a similar geographic composition to the larger Partners HealthCare patient panel. For example, in FY18, data indicate that 62% (46,997 patients) of MGH's ED patients resided in HSA 4; 15% (11,319 patients) resided in HSA 6; 6% (4,682) resided in HSA 5; 4% (3,284 patients) resided in HSA 3; 2% (1,423 patients) resided in HSA 2; 1% (529 patients) resided in HSA 1; and 10% (7,351 patients) came from outside of Massachusetts. Less than 1% of patients seeking care in the ED either came from other countries or unknown geographies.

With respect to age, 65% (49,579 patients) of patients that sought treatment at MGH's ED in FY18 were in the 18-64 age cohort, while 23% (17,332 patients) of patients were aged 65+ and 12% of patients (9,490 patients) were aged 0-17. Although utilization trends for the past two fiscal years are similar for the 0-17 and 18-64 age cohorts, the 65+ age cohort has increased utilization of the MGH ED by 1% each year for the past three years.

Patients that utilize MGH's ED also reflect diverse races. Data based on patient self-reporting demonstrate that in FY18, 67% of MGH's ED patients identified as White or Caucasian; 10% identified as African American or Black; and 5% identified as Asian. Approximately 1% of MGH's ED patients identified as Hispanic. Patients were grouped into these categories based on how they self-identified;[10] as such, there is a portion of the patient population (17% in FY18) that

[9] This slight decrease in ED patient volume was due to a number of factors, including 1) Hospital-wide efforts to reduce ED volume; 2) A milder flu season in FY 17; and 3) A more restrictive policy for ED-to-ED transfers from other hospitals.

[10] With the exception of the category "Hispanic/Latino", the race categories shown above are based on the 1997 Office of Management and Budget standards on race and ethnicity. Patients were grouped into these categories based on their responses as follows – White: "White"; African American or Black: "African American", "Black", "Black or African American"; American Indian or Alaska Native: "American Indian", "American Indian or Alaska Native";

either chose to not report their race or identified as a race that did not align with the above categories. Therefore, it is important to note that the racial composition of MGH's ED patients may be understated. The racial breakdown of the ED panel had not significantly changed over the past three fiscal years.

in FY18, 51% of MGH's ED patients were male, while 49% were female. Patients were categorized as male or female based on self-identification, and less than 1% identified as other. This ratio of male to female patients is consistent with patient utilization data for FY16 and FY17.

The most prevalent diagnoses encountered in MGH's ED in FY18 consisted of: (1) Other; (2) Chest pain; (3) Headache; (4) Syncope and collapse; (5) Lower back pain; (6) Dizziness and giddiness; (7) Alcohol abuse with intoxication; (8) Acute upper respiratory infection; (9) Urinary tract infection; and (10) Unspecified abdominal pain. FY16 to FY18 exhibit similar trends. The breakdown of patients with each of these conditions may be found in Attachment 2.

F1.a.ii **Need by Patient Panel:**

Provide supporting data to demonstrate the need for the Proposed Project. Such data should demonstrate the disease burden, behavioral risk factors, acuity mix, health disparities, or other objective Patient Panel measures as noted in your response to Question F1.a.i that demonstrates the need that the Proposed Project is attempting to address. If an inequity or disparity is not identified as relating to the Proposed Project, provide information justifying the need. In your description of Need, consider the principles underlying Public Health Value (see instructions) and ensure that Need is addressed in that context as well.

A. Behavioral Health and the Need for Additional Capacity MGH

Between 2009 and 2015, the number of emergency department visits related to mental health increased 56% among children and 41% among adults nationwide.[11] Throughout Massachusetts, delays for behavioral health patients awaiting inpatient care in EDs have become a crisis.[12] To combat this issue, the Massachusetts Department of Public Health ("Department") convened a task force in 2013 to examine the issue of ED boarding. This task force was charged with evaluating data, trends, and possible policy solutions. In 2015, the Department updated its Code Help policies and regulations to address the need to move behavioral health patients from the ED to more appropriate care settings.

In 2017, the *Annals of Emergency Medicine* published a study that investigated ED Boarding at 10 Massachusetts hospitals.[13] This study reviewed care provided to over 800 patients at ten

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Asian: "Asian"; Native Hawaiian or Other Pacific Islander: "Native Hawaiian or Other Pacific Islander", "Native Hawaiian/Other Pacific Islander", "Pacific Islander"; Hispanic/Latino: "Hispanic"," Hispanic or Latino"," Latino"; Other/Unknown: All other responses.

[11] Doug Brunk, *Mental health visits, boarding continue to climb,* CLINICAL PSYCHIATRY NEWS (Oct. 1, 2018), https://www.mdedge.com/psychiatry/article/176014/mental-health/mental-health-visits-boarding-continue-climb.

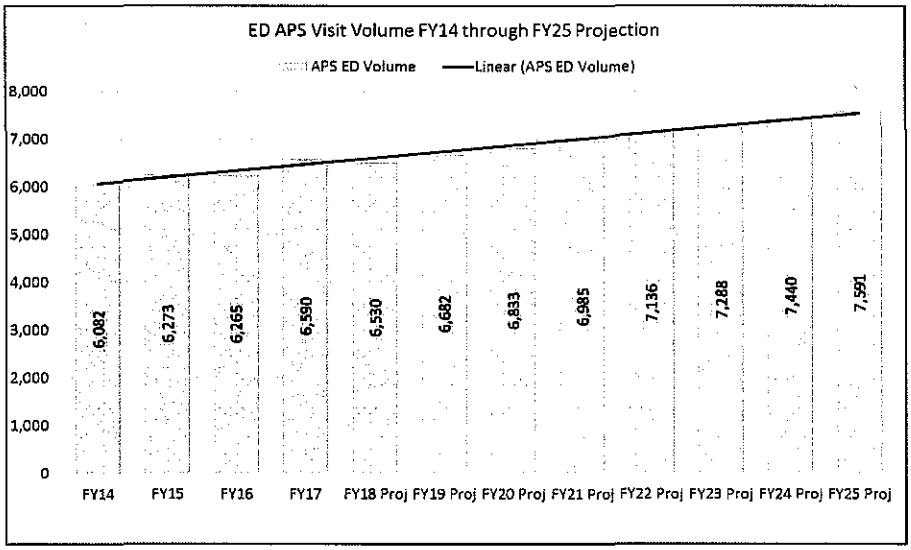
[12] *Id.*

[13] Mark D. Pearlmutter et al., *Analysis of Emergency Department Length of Stay for Mental Health Patients at Ten Massachusetts Emergency Departments*, 70 ANNALS OF EMERGENCY MED. 193, 193 (2017), *available at* http://www.annemergmed.com/article/S0196-0644(16)31217-3/pdf.

unnamed EDs over a two-week period in 2012.[14] Researchers found that patients with mental health issues waited an average of 16.5 to 21.5 hours for an admission or a transfer.[15] Meanwhile, patients with physical health problems spent an average of 4 hours in the ED.[16] Moreover, the researchers observed that the median length of stay for mental health patients was nearly 11 hours, with certain types of insurance coverage correlating with longer lengths of stay in the ED.[17] For example, within the study, patients with Medicaid were twice as likely, and uninsured patients were 2.8 times as likely as privately insured patients to see delays of a day or more for inpatient placement.[18] Uninsured patients with mental health diagnoses also waited in the ED for approximately 4 hours longer than privately insured patients.[19]

Similar to the aforementioned study, MGH's ED has similar psychiatric boarding issues. Over the last three fiscal years, the demand for acute psychiatric services ("APS") in MGH's ED has continued to increase, with an expected annual patient volume of approximately 7,600 patients by FY25. From FY14 to FY18 APS volume in the ED grew 7%. From FY18 to FY25, behavioral health patient volume is expected to grow an additional 16%. Overall, from FY14 to FY25 APS volume within MGH's ED is expected to increase by over 22%. Table 1 below depicts historical volume data, as well as volume projections for APS at MGH.

Table 1: ED APS Visit Volume FY14 through FY25



Currently, the MGH ED has only 6 secured bays for APS. Due to demand, the APS census is consistently above available capacity in the APS area. In FY18, the median daily APS census at MGH was 15 patients and was as high as 25 patients during peak times. Once the APS bays are full, the remaining patients are placed throughout other areas of the ED, requiring additional resources for observation and safety. Assuming the projected increase of patients per year through 2025, MGH will continue to have significant difficulty caring for APS patients in the ED.

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[14] *Id.*; Lisa Creamer, *Study: Patients With Mental Illnesses Wait Significantly Longer Inside Mass. Emergency Rooms*, WBUR (Jan. 5, 2017), http://www.wbur.org/commonhealth/2017/01/05/study-mental-illness-er-waits.
[15] Pearlmutter, *supra* note 13; Creamer, *supra* note 14.
[16] Pearlmutter, *supra* note 13; Creamer, *supra* note 14.
[17] Pearlmutter, *supra* note 13; Creamer, *supra* note 14.
[18] Pearlmutter, *supra* note 13; Creamer, *supra* note 14.
[19] Pearlmutter, *supra* note 13; Creamer, *supra* note 14.

Furthermore, "prolonged ED stays are associated with increased risk of symptom exacerbation or elopement for patients with mental health/substance abuse issues.[20] External stimuli from the busy ED can increase patient anxiety and agitation, which is potentially harmful for both patients and staff.[21] Elopement from the ED prior to definitive screening and treatment can lead to increased risk of self-harm and suicide.[22] In addition, mental health patients in the ED contribute to other system issues, as previously referenced, such as increased ancillary resource utilization (e.g. sitters, security officers, etc.) as a safety measure to protect staff and patients."[23] Accordingly, care for all patients is more effective and efficient by "cohorting" patients in a dedicated APS area.

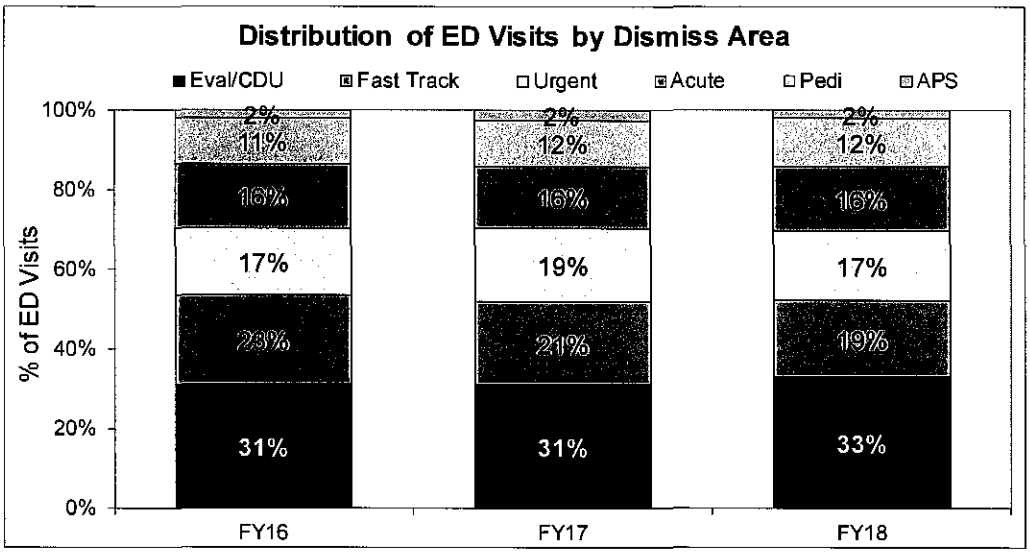
Through the proposed Project, MGH will renovate 6,700 square feet on the first floor of the Gray and Jackson Buildings on the Hospital's main campus to increase APS capacity by creating a secured unit with 20 treatment rooms. This designated treatment space will create care efficiencies that allow more APS patients to receive expedited care in a more therapeutically appropriate clinical setting.[24] Specifically, treatment for APS patients will have lower stimulation, reducing agitation and violent behavior, thus improving patient and staff safety. This new secured unit will allow the hospital to address the sustained high capacity for APS services, as well as ensure patients are treated in the most appropriate clinical setting.

B. The Need for Greater Throughput and Care Efficiencies in MGH's ED

In past years, creating more effective and efficient throughput within EDs has been a major focus for most US hospitals, as when EDs are crowded with lower acuity patients, it prevents patients with acute needs from receiving timely care, leading to adverse impacts on patient outcomes and health care costs.[25] Over the last three years, the demand for services in the fast track area of the ED (an area designated for lower-acuity patients who tend to need urgent care services rather than emergent care) and the Clinical Decision Unit ("CDU") within the ED (where patients are evaluated and moved to other areas of the ED depending on acuity level), have been consistent. Table 2 below provides a breakdown of MGH's ED visits by type with fast track visits representing a little over 20% of all ED visits and evaluation visits representing just over 30% of all visits.

[20] B.A. Nicks et al., *The impact of psychiatric patient boarding in emergency departments*, 2012 EMERGENCY MEDICINE INTERNATIONAL, 360308 (June 5, 2012).
[21] *Id.*
[22] *Id.*
[23] *Id.*
[24] Pearlmutter, *supra* note 13; Creamer, *supra* note 14.
[25] Jacqueline Fellows, *Simple Changes for Boosting ER Throughput,* HEALTHLEADERS (Sept. 18, 2015), https://www.healthleadersmedia.com/clinical-care/simple-changes-boosting-er-throughput.

Table 2: Percentage of ED Visits at MGH by Type of Visit



Through the Proposed Project, the Hospital will renovate 9,500 square feet of the ED, part of which currently contains the APS. This renovated space will provide additional patient bays with cardiac monitoring and medical gas capabilities, allowing greater flexibility to treat more complex and higher acuity patients. Moreover, this renovation will allow ED staff to redesign workflows, leading to greater throughput, ensuring more timely care, faster discharge processes and faster admission procedures. Finally, the renovation will improve privacy and patient satisfaction.

C. An Aging Patient Population Needs Access to ED Services

The proposed Project also will allow the Applicant, and specifically MGH, to address the needs of an aging patient panel and the need to improve access to ED services. According to the University of Massachusetts' Donahue Institute's ("UMDI") *Long-Term Population Projections for Massachusetts Regions and Municipalities*, the statewide population is projected to increase by 11.8% between 2010 and 2035.[26] An analysis of UMDI's projections shows that the growth of the Commonwealth's population is segmented by age sector, and that within the next 20 years, the bulk of the state's population growth will cluster around residents that are age fifty (50) and older.[27] Moreover, between 2015 and 2035, the 65+ population is expected to increase at a higher rate compared to all other age cohorts.[28] By 2035, the 65+ age cohort will represent

[26] LONG-TERM POPULATION PROJECTIONS FOR MASSACHUSETTS REGIONS AND MUNICIPALITIES, UNIVERSITY OF MASSACHUSETTS DONAHUE INSTITUTE 11 (Mar. 2015), *available at* http://pep.donahue-institute.org/downloads/2015/new/UMDI_LongTermPopulationProjectionsReport_2015%2004%20_29.pdf. The Massachusetts Secretary of the Commonwealth contracted with the University of Massachusetts Donahue Institute (UMDI) to produce population projections by age and sex for all 351 municipalities. *Id.* at 7. Within the past five years, Massachusetts has been experiencing an increase in the population growth rate per year due to high immigration and low domestic outflow, which is expected to slow down in 2030. *Id.* at 12.

[27] *Massachusetts Population Projections – EXCEL Age/Sex Details*, UNIVERSITY OF MASSACHUSETTS DONAHUE INSTITUTE (2015), http://pep.donahue-institute.org/downloads/2015/Age_Sex_Details_UMDI_V2015.xls. This data has been extracted for counties where current Partners HealthCare hospitals and affiliates are located. *Id.*

[28] UNIVERSITY OF MASSACHUSETTS DONAHUE INSTITUTE, *supra* note 26, at 14. The report uses the cohorts as defined by the U.S. Census Bureau 2010 Census Summary, which are 0-19, 20-39, 40-64, and 65+. *Id.* Figure 2.5 in the report demonstrates that where the 65+ cohort increases from 2015 to 2035, all other cohorts are predicted to decrease. *Id.*

approximately a quarter of the Massachusetts population.[29] The general trend of growth appears consistent across MGH's service area. As the number of patients that fall into the 65+ age cohort for MGH continues to grow, the demand for ED services is expected to increase as well.

Elderly patients (those within the 65+ age cohort) are one of the top three age groups that tend to use the ED for primary care services.[30] Studies show that older adults use emergency services at a higher rate than young adults.[31] Moreover, when an older adult presents at an ED, the visit typically is more emergent and requires longer stays and increased services.[32] Elderly patients also are more likely to make repeat ED visits due to complex care needs.[33] As previously discussed, individuals in the 65+ age cohort account for 23% of all ED visits at MGH. Due to the projected increase in the older adult population, MGH's ED requires renovations to redesign patient flow to manage the higher care demands of this population.

F1.a.iii **Competition:**

Provide evidence that the Proposed Project will compete on the basis of price, total medical expenses, provider costs, and other recognized measures of health care spending. When responding to this question, please consider Factor 4, Financial Feasibility and Reasonableness of Costs.

The Proposed Project will not have an adverse effect on competition in the Massachusetts healthcare market based on price, TME, provider costs or other recognized measures of health care spending. Rather, by increasing throughput, reducing wait times and decreasing boarding within the MGH ED, the Proposed Project will have a negligible to positive impact on the overall health care market. Over the years, research studies have reviewed the impact on wait times and extended boarding on hospitals costs. In 2010, Huang et al. found that when a patient's triage to admission was greater than 12 hours, the patient's cost of care was 11% higher.[34] Building upon this research, Woodworth et al. sought to understand the impact of timely care on costs and found that, "for patients who arrive at the ED with the most acute conditions, a 60-minute increase in wait time increases the hospital's cost to care for the patient by an average of 30%. For patients who arrive with moderately acute conditions, a 60-minute increase in wait time increases the hospital's cost to care for the patient by an average of 21%.[35] Accordingly, a reduction in wait times by even 60-minutes will decrease the overall cost of care for hospital providers by 21-30% (depending upon the acuity level of the patient), thereby reducing TME. Through the Proposed Project, MGH aims to reduce wait times through greater throughput and more expeditious care.

Moreover, behavioral health patients in the ED that exhibit signs of agitation and aggression are the most difficult patients to place within inpatient units as frequently these patients require

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[29] *Id.*

[30] Doris F. Glick et al., *Analysis of emergency room use for primary care needs*, 15 NURSING ECONOMICS 42 (1997).

[31] Faranak Aminzadeh et al., *Older adults in the emergency department: A systematic review of patterns of use, adverse outcomes, and effectiveness of interventions*, 39 ANNALS OF EMERGENCY MED. 238, 238-47 (2002).

[32] *Id.*

[33] SR Lowenstein et al., *Care of the elderly in the emergency department*, 15 ANNALS OF EMERGENCY MED. 528, 528-35 (1986).

[34] Qing Huang et al., *The impact of delays to admission from the emergency department on inpatient outcomes*, 10 BMC EMERGENCY MEDICINE 16 (2010).

[35] Lindsey Woodworth et al., *Just a Minute: The Effect of Emergency Department Wait Time on Cost of Care*, AM. ECONOMIC ASSOCIATION, *available at* https://www.aeaweb.org/conference/2018/preliminary/paper/AQRh5Azk (last visited Apr. 2, 2019).

assignment to settings that have specific resources to address behavioral challenges. However, if these patients are placed in a more therapeutic environment, such as an APS, which has less stimulation than the ED, providers will be able to more readily control their behavior, allowing for expedited placement to the inpatient setting and reduced boarding times in the APS. Studies have found that the average cost of psychiatric patient boarding is approximately $100 per hour with the average psychiatric patient costing an ED up to $1,198.[36] When the costs of lower bed turnover are factored in, the total cost leaps to $2,264 per patient.[37] Of course, these average costs rise based on increased boarding times. As previously discussed in *Section F.1.a.ii Need by the Patient Panel*, MGH's boarding times have increased significantly over the past three years. The addition of the secured APS unit will create greater throughput in the ED, allowing for APS patients to be moved to a more appropriate, private care setting in a timely manner, leading to expedited inpatient placement and reduced overall length of stay. Shifting behavioral health patients to a more appropriate setting will also allow for a reduction in ancillary resources needed in the ED for this patient population, such as sitters, security officers, etc. Accordingly, providing APS patients with expedited care will decrease provider costs, reducing overall TME.

F1.b.i **Public Health Value /Evidence-Based:**
Provide information on the evidence-base for the Proposed Project. That is, how does the Proposed Project address the Need that Applicant has identified.

A. MGH's Proposed Renovation and Creation of a Secured APS Unit

The Applicant's proposed ED renovation and expanded, secured APS Unit is supported by extensive literature related to evidence-based strategies to reduce ED crowding for behavioral health patients and improve patient throughput. Nationally, behavioral health patients account for between 6% and 9% of all ED visits, with behavioral health patients waiting significantly longer to be seen than patients presenting with physical health needs.[38] Studies have found that as many as 71% of patients who received a psychiatric evaluation in the ED were admitted for inpatient psychiatric care.[39] Moreover, ED visits related to behavioral health and substance use disorders result in a 2.5 times higher likelihood of being admitted to the hospital when compared to non-behavioral health conditions.[40] Health care providers, as well as behavioral health patients generally report a negative experience with psychiatric services in general ED settings and express a clear preference for treatment in a specialized psychiatric area of the ED.[41] Evidence-based research has demonstrated that with appropriate interventions, the majority of psychiatric emergencies can be resolved in less than twenty-four hours, much like other physical medical emergencies.[42]

Research has shown that noisy, hectic EDs are upsetting to behavioral health patients, and the longer a patient stays the worse the symptoms become.[43] Symptoms may be exacerbated as a

[36] Nicks, *supra* note 20.
[37] Nicks, *supra* note 20.
[38] Scott Zeller et al., *Effects of a Dedicated Regional Psychiatric Emergency Service on Boarding of Psychiatric Patients in Area Emergency Departments,* 15 WESTERN JOURNAL OF EMERGENCY MED. 1, 1-2 (Feb. 2014).
[39] *Id.* at 2.
[40] *Id.*
[41] *Id.* at 1.
[42] Scott Zeller, *emPATH Units as a Solution for ED Psychiatric Patient Boarding,* PSYCHIATRY ADVISOR (Sept. 7. 2017), https://www.psychiatryadvisor.com/home/practice-management/empath-units-as-a-solution-for-ed-psychiatric-patient-boarding/.
[43] CARE OF THE PSYCHIATRIC PATIENT IN THE EMERGENCY DEPARTMENT – A REVIEW OF THE LITERATURE, AMERICAN COLLEGE OF EMERGENCY PHYSICIANS (Oct. 2014), *available at* https://www.acep.org/globalassets/uploads/uploaded-

result of being confined to a gurney, guarded by personnel, flashing lights, loud noises, and other agitating activity.[44] Therefore, it is beneficial to move medically cleared patients to calmer, quieter environments as soon as possible following presentation to the ED, as increased boarding times in the chaotic environment of the ED are often associated with poorer health outcomes for behavioral health patients.[45] Increased boarding times also may lead behavioral health patients to pace or become anxious, leading to agitation or becoming loud and disrupting others.[46] An isolated, therapeutic unit where patients can interact with personnel who are trained to speak in quiet tones is crucial to the de-escalation of a patient in the midst of a behavioral health crisis.[47]

B. Redesign of ED Space for Greater Throughput

MGH also proposes to redesign a small area of the Hospital's ED (that will be vacant due to the relocation of the existing APS) to accommodate designated spaces for patients presenting with various acuity levels. This process involves triaging similar patients (with regard to disease severity, nature of compliant, or condition) to a particular work stream.[48] Typically, patients in each work area of the ED are assessed by dedicated staff in that area and managed through separate processes.[49] Evidence suggests that dividing patients into different pathways results in reduced wait times and shorter lengths of stay.[50] The effectiveness of this strategy is dependent on having enough appropriately plotted physical space to meet the patient demand of each individual work stream.[51] Thus, renovations and the workflow redesign of MGH's ED is necessary to allow for this model of care.

F.1.b.ii **Public Health Value /Outcome-Oriented:**
Describe the impact of the Proposed Project and how the Applicant will assess such impact. Provide projections demonstrating how the Proposed Project will improve health outcomes, quality of life, or health equity. Only measures that can be tracked and reported over time should be utilized.

A. A Larger Secured APS Unit and Renovations to the Hospital's ED will Lead to Improved Health Outcomes and Quality of Life

The Applicant anticipates that the proposed Project will provide MGH's ED patients, including behavioral health patients with improved health outcomes, improved quality of life and additional access to high quality ED and behavioral health services by creating a larger, secured APS unit that will provide a more therapeutic environment. In addition, redesign of select ED workflow processes will create greater throughput. As more fully discussed in Factor F.1.b.i., an expanded, secured APS Unit will allow patients presenting to the ED with mental

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files/acep/clinical-and-practice-management/resources/mental-health-and-substance-abuse/psychiatric-patient-care-in-the-ed-2014.pdf; Zeller, *supra* note 42.

[44] CARE OF THE PSYCHIATRIC PATIENT IN THE EMERGENCY DEPARTMENT – A REVIEW OF THE LITERATURE, *supra*; Zeller, *supra* note 42.

[45] CARE OF THE PSYCHIATRIC PATIENT IN THE EMERGENCY DEPARTMENT – A REVIEW OF THE LITERATURE, *supra* note 43; Zeller, *supra* note 42.

[46] *The Treatment of Psych Patients in the ED: What You Need to Know – Part 1*, COMPASS CLINICAL CONSULTING (June 1, 2017), https://www.compass-clinical.com/treatment-psych-patients-ed-need-know-part-1/.

[47] *Id.*

[48] Paul Richard Edwin Jarvis, *Improving emergency department patient flow,* 3 CLIN. EXP. EMERG. MED. 2, 63-68 (2016).

[49] *Id.*

[50] *Id.*

[51] *Id.*

health conditions and substance use disorders to be evaluated medically and then transferred to the secured APS for observation or while waiting for an inpatient bed or transfer. By shifting these patients to a more clinically appropriate environment patients will have reduced levels of agitation, decreasing incidences of violence with other patients and staff. Moreover, this calmer environment will allow behavioral health patients to receive timely treatment and expedited care processes, ultimately leading to improved health outcomes.

The renovation of the vacated APS and surrounding space will improve efficiencies through regionalized treatment based on acuity level. Renovations that create improved space for complex, acute patients will ensure that these patients receive expedited services, and in some cases life-sustaining treatment. Expedited care leads to improved quality outcomes, higher levels of patient satisfaction and enhanced throughput processes.

B. Additional Strategies for Improving Patient Experience and Ensuring High Quality Outcomes for All Services at MGH

The Applicant and MGH are committed to developing and implementing population health management ("PHM") strategies to ensure high quality outcomes and an exceptional care experience for all patients. Currently, MGH is in the midst of a ten-year strategic plan aimed at improving patient experience and clinical quality outcomes, as well as reducing the costs associated with care. Every clinical department at MGH, including the ED, has a PHM strategy. Currently, high quality patient outcomes are achieved through these strategies, which are aimed at improving quality, efficiency and the patient experience. Care models that are rooted in collaboration, including patient-centered medical homes, care integration and other care initiatives are specifically designed by MGH clinicians. Accordingly, MGH offers a number of programs to ensure quality care for patients.

First, MGH offers alternative care pathways to patients, so they may avoid unnecessary visits to the emergency department or inpatient hospitalizations. One such program is the Partners Mobile Observation Unit ("PMOU"), which is a program that provides home-based urgent care for patients experiencing at-risk medical events believed to be treatable with enhanced home care. MGH's Home Hospital Program also offers daily hospital-level care at home through team-based care. Finally, MGH participates in the Skilled Nursing Facility ("SNF") Three Day Waiver Program. Through this program, clinically appropriate Medicare patients may be admitted directly to a SNF for short-term skilled nursing care and/or rehabilitation care without needing to be admitted to the Hospital for three consecutive days.

Second, for MGH's highest risk and most complex patients, clinical staff offer the Integrated Care Management program ("iCMP"). iCMP provides eligible patients with a care manager who develops a care plan in tandem with the patient and other members of the clinical team. The care manager works in-person and telephonically to coordinate a patient's care and ensures that patients are not readmitted to the hospital when possible. Additionally, the care manager connects patients with community based resources that are vital for recovery. MGH also offers the Integrated care management program, Patients Linked to Urgent Supports ("PLUS"). This program provides intensive wrap-around services (psycho-social supports) to a small number of patients. Services include acute community paramedicine, crisis stabilization units, and coordinated transportation. All of these programs assure that MGH's patients have the highest quality care, as well as a superior care experience.

Third, for those patients enrolled in a Medicaid Accountable Care Organization, MGH has a multi-pronged approach to identify the unmet medical and non-medical needs of these patients.

An ED Navigator, a non-clinical resource specialist, assists these members, who present to the Emergency Department, with a range of services including, primary care; community resources; and links to community organizations.

Through the Proposed Project, the ED will continue to offer these programs to patients, thereby ensuring improved quality outcomes for patients and a better overall patient experience. For all patients, access to these critically needed services will allow them to receive appropriate and timely care, as well as address any social determinant of health challenges that a patient may be facing. By providing access to these PHM strategies, MGH provides holistic care, which in turn ensures higher quality outcomes.

C. Assessing the Impact of the Proposed Project

To assess the impact of the Proposed Project, MGH developed the following metrics and reporting schematic, as well as metric projections for process and quality indicators that will measure patient satisfaction, access and quality of care. The measures are discussed below:

1. **Satisfaction – Patient Satisfaction:** Patients that are satisfied with care are more likely to seek additional treatment when necessary. MGH will review patient satisfaction levels with ED services via an overall satisfaction scale of 0-10.

   Measure: To ensure a service-excellence approach, patient experience metrics are collected through the QDM survey vendor (via phone) from patients who visited the MGH ED. Patients are asked specific questions around satisfaction with wait times, communication and various aspects of their care. MGH will monitor responses to all of these questions, with particular focus on overall satisfaction with care provided.

   Projections: Baseline: 57.0%; Year 1: 58.0%; Year 2: 59.0%; and Year 3: 60.0%

   Monitoring: Any category receiving a less than exceptional rating (satisfactory level) will be evaluated and policy changes instituted as deemed appropriate.

2. **Access – Leave Without Being Seen and Leave Without Clinical Treatment:** Given enhanced throughput, MGH ED staff will reduce the percentages of patients who leave without being seen or leave without receiving treatment.

   Measure: The number of patients leaving the ED without treatment, without being seen or without an appropriate discharge.

   Projections: Baseline: 2.4%; Year 1: 2.3%; Year 2: 2.2%; and Year 3: 2.1%

   Monitoring: This data will be evaluated on a quarterly basis by the ED operations leadership team.

3. **Clinical Quality – Access Measure – The Amount of Time between ED Arrival to Being Seen by a Provider:** Patients will be evaluated to determine the amount of time it takes for the individual to move from arrival as a patient in the ED to being seen by a physician (or equivalent, such as a physician assistant or nurse practitioner).

   Measure: The amount of time it takes between a patient arriving to the ED to being seen by a treating provider.

Projections:[52] Baseline: 30 minutes; Year 1: 29 minutes; Year 2: 28 minutes; and Year 3: 27 minutes

Monitoring: This data will be evaluated on a quarterly basis by the ED operations leadership team.

4. **Process Measure – Percentage of APS Patients Treated Outside the APS Area:** Approximately 69% of ED patients presenting with psychiatric needs are treated outside of the APS. Consequently, patients are treated in locations that may impact privacy and patient experience. This measure will monitor the amount of psychiatric care provided outside of the APS to determine the impact of the redesigned space.

   Measure: The percentage of APS patients treated outside of the APS Area.

   Projections: Baseline: 69%; Year 1: 35%; Year 2: 00%; and Year 3: 30%

   Monitoring: This data will be evaluated on a quarterly basis by the ED operations leadership team.

F1.b.iii **Public Health Value /Health Equity-Focused:**

For Proposed Projects addressing health inequities identified within the Applicant's description of the Proposed Project's need-base, please justify how the Proposed Project will reduce the health inequity, including the operational components (e.g. culturally competent staffing). For Proposed Projects not specifically addressing a health disparity or inequity, please provide information about specific actions the Applicant is and will take to ensure equal access to the health benefits created by the Proposed Project and how these actions will promote health equity.

To ensure health equity to all populations, including those deemed underserved, the Proposed Project will not affect accessibility of MGH's services for poor, medically indigent, and/or Medicaid eligible individuals. MGH does not discriminate based on ability to pay or payer source and this practice will continue following implementation of the Proposed Project. As further detailed throughout this narrative, the Proposed Project will increase access to high quality ED and behavioral health services for all patients in a number of ways.

Over the past decade, MGH has launched a variety of diversity initiatives to address healthcare disparities, increase the percentage of employees from underrepresented groups, build trust among people of diverse backgrounds and evaluate the hospital's progress. Given these efforts, MGH was recently named one of the nation's top ten hospitals and health systems on diversity issues by Diversity Inc., a publication that monitors best practices in the field. With these goals and MGH's commitment to increasing the number of employees from underrepresented groups, the hospital's staff represent various races and ethnicities. Through the Proposed Project, patients will have access to culturally competent staffing through clinical staff representatives of various races and ethnicities. The Hospital is committed to recruiting and hiring additional diverse staff that reflect the Hospital's patient panel.

[52] MGH's current rate for this measure is one of the lowest in Massachusetts. Accordingly, overall improvement on this metric will be challenging given the hospital's current position.

Moreover, Partners HealthCare, and specifically MGH, has also adopted the Culturally and Linguistically Appropriate Service ("CLAS") standards set forth by the U.S. Department of Health and Human Services Office of Minority Health for all practice sites. MGH provides effective, understandable, and respectful care with an understanding of patients' cultural health beliefs and practices and preferred languages. Additionally, MGH has arrangements to offer ongoing education and training in culturally and linguistically appropriate areas for staff at all levels and across all disciplines.

In regard to interpreter services, MGH provides staff interpreters that speak eleven languages, including American Sign Language ("ASL"). Interpretations for encounters that occur at MGH's main campus staff are documented in a centralized Interpreter Services Tracking System, which contains a reporting tool for year-end statistics of positive encounters. MGH staff review the annual statistics and seek ways to improve these services.

Finally, all Partners HealthCare hospitals, including MGH participate in the American Hospital Association's #123Equity Pledge Campaign. This Campaign seeks to eliminate health and health care disparities that exist for racially, ethnically and culturally diverse individuals. The campaign requires hospital leaders to accelerate progress in the following areas: (1) Increasing the collection and use of race, ethnicity, language preference and other socio-demographic data; (2) Increasing cultural competency training; and (3) Increasing diversity in leadership and governance. Currently, all Partners HealthCare hospitals participate in the Campaign. This Campaign will allow MGH staff to ensure equal access to the benefits created by the Proposed Project.

F1.b.iv Provide additional information to demonstrate that the Proposed Project will result in improved health outcomes and quality of life of the Applicant's existing Patient Panel, while providing reasonable assurances of health equity.

The Proposed Project seeks to ensure timely access to ED services. By providing patients with access to these services, patient wait times for care will be reduced. Timely treatment often ensures fewer complications, leading to reduced repeat emergency department visits and hospitalizations and improved health outcomes. Moreover, expedited access to care may lead to a reduction in disease/condition-related complications, such as pain that directly impact a patient's quality of life.

F1.c Provide evidence that the Proposed Project will operate efficiently and effectively by furthering and improving continuity and coordination of care for the Applicant's Patient Panel, including, how the Proposed Project will create or ensure appropriate linkages to patients' primary care services.

To ensure continuity of care, improved health outcomes and enhanced quality of life, through the proposed Project, MGH's ED staff will continue existing formal processes for linking patients with their primary care physicians for follow-up care, as well as case management/social work support to ensure patients have access to resources around social determinant of health ("SDoH") issues. Providing patients with linkages to these necessary services prevents unnecessary readmissions, ensures appropriate care management and provides the patient with additional resources that impact care. Moreover, patients at MGH will benefit from MGH's mature PHM strategies, including an existing system of care coordination and care delivery alternatives aimed at improving patient experience and outcomes.

Partners has a number of integrated care programs in place to ensure continuity of care and care integration. In addition to previously discussed PHM programs, MGH assists patients with linkages to care and SDoH through care managers who follow-up with patients after ambulatory care. These care manager's follow-up with patients telephonically to provide medication reconciliation and coordinate care with clinicians to optimize recovery. Moreover, and as discussed, MGH also offers a number of alternatives to ED care for patient, such as PMOU, which is a program that provides home-based urgent care for patients experiencing at-risk medical events believed to be treatable with enhanced home care. Accordingly, these efforts and initiatives ensure patients are appropriately linked to care integration resources.

F1.d **Provide evidence of consultation, both prior to and after the Filing Date, with all Government Agencies with relevant licensure, certification, or other regulatory oversight of the Applicant or the Proposed Project.**

As a broad range of input is valuable in the planning of a project, the Applicant carried out a diverse consultative process with individuals at various regulatory agencies regarding the Proposed Projects. The following individuals are some of those consulted regarding this Project:

- Department of Public Health: Nora Mann, Director, Determination of Need Program; Rebecca Rodman, Deputy General Counsel; and Ben Wood, Director, Office of Community Health Planning and Engagement.
- MassHealth: Steven Sauter, Director, Acute Hospital Program, MassHealth Office of Providers and Plans and David Garbarino, Director of Purchasing Strategy and Analytics at Executive Office of Health and Human Services – MassHealth.

F1.e.i **Process for Determining Need/Evidence of Community Engagement:**
For assistance in responding to this portion of the Application, Applicant is encouraged to review *Community Engagement Standards for Community Health Planning Guideline*. With respect to the existing Patient Panel, please describe the process through which Applicant determined the need for the Proposed Project.

A. Community Engagement on the Expansion of Behavioral Health Services and Renovation of the Hospital ED

Based upon growing demand by MGH's patient panel for ED and behavioral health services and given space constraints within the ED, MGH developed a plan to renovate and expand the ED to accommodate a secured unit for behavioral health patients. In contemplation of this expansion and renovation, MGH's leadership sought to define its community broadly and engage patients and family members that may be impacted by the Proposed Project to obtain feedback and answer questions. These engagement efforts are described below.

In an effort to ensure appropriate community engagement, the Proposed Project was presented at an Experience Design Workshop for the MGH – Cambridge Street Project Patient and Family Advisory Council ("PFAC"). The purpose of this meeting was to build a vision for the ideal MGH experience based on patient and family member feedback. At this workshop, participants were taken through a series of interactive activities, where they provided input on proposed projects, such as the renovation of the ED and expansion of a secured APS unit. An agenda and list of

attendees for the meeting may be found in Attachment 4c. Overall feedback from the meeting was very positive and supportive of the plan. There were no concerns expressed by this group.

F1.e.ii **Please provide evidence of sound Community Engagement and consultation throughout the development of the Proposed Project. A successful Applicant will, at a minimum, describe the process whereby the "Public Health Value" of the Proposed Project was considered, and will describe the Community Engagement process as it occurred and is occurring currently in, at least, the following contexts: Identification of Patient Panel Need; Design/selection of DoN Project in response to "Patient Panel" need; and Linking the Proposed Project to "Public Health Value".**

To ensure sound community engagement throughout the development of the Proposed Project, the Applicant, in conjunction with MGH, took the following actions:

- Presented to the MGH – Cambridge Street Project PFAC on February 11, 2019 at an Experience Design Workshop.

For detailed information on these activities, see Attachment 4c.

For transparency and to educate the community regarding the public health value of the proposed ED renovation and expansion, MGH staff presented at a PFAC meeting and documented the components of the Proposed Project, how the project will address the needs of the aging patient panel, as well as the impact of the Proposed Project.

Factor 2: Health Priorities

Addresses the impact of the Proposed Project on health more broadly (that is, beyond the Patient Panel) requiring that the Applicant demonstrate that the Proposed Project will meaningfully contribute to the Commonwealth's goals for cost containment, improved public health outcomes, and delivery system transformation.

F2.a. **<u>Cost Containment:</u>**
Using objective data, please describe, for each new or expanded service, how the Proposed Project will meaningfully contribute to the Commonwealth's goals for cost containment.

The goals for cost containment in Massachusetts center around providing low-cost care alternatives without sacrificing high quality. In fact, the Commonwealth's independent state agency that develops policy to reduce health care cost growth and improve the quality of patient care, the Health Policy Commission, has a stated goal of bettering health and care at a lower cost across the Commonwealth. Consequently, the Proposed Project will meaningfully contribute to Massachusetts' goals for cost containment through the efforts outlined below. First, an expanded ED APS unit will allow for timely treatment, ensuring care in a more appropriate and therapeutic setting. By caring for behavioral health patients in a designated area separated from the main ED, resources to ensure the safety of the patient, staff, and other ED patients, such as sitters or security offers may be used more efficiently. Moreover, timely treatment in an appropriate environment may lead to faster recovery times for patients and less agitation, leading to shorter lengths of stay and overall lower costs.

Second, renovating the existing ED space will create greater throughput for medical patients, leading to expedited care processes, including more efficient discharge and transfer processes, leading to reductions in the cost of care. Moreover, MGH's ED staff have implemented on-going efforts to decrease ED costs, including implementation of the aforementioned PHM programs, such as improved care management pathways for patients with multiple visits and accelerating ED length of stay reduction efforts.

F2.b. **Public Health Outcomes:**
Describe, as relevant, for each new or expanded service, how the Proposed Project will improve public health outcomes.

The expansion of emergent behavioral health services and minor renovation of the MGH ED will improve public health outcomes through additional capacity and improved care processes as demand continues to increase for the aging patient panel, ultimately leading to better quality outcomes and an enhanced patient care experience. Moreover, as discussed, studies have documented the benefits of obtaining timely ED and behavioral health services, including expedited treatment of diseases and conditions that impact a patient's quality of life. When patients receive care in the appropriate setting and achieve cost savings, both the health care market and patients benefit from these practices.

Additionally, by providing patients with high quality care services in appropriate settings, patients are more likely to stay to obtain care services (a reduction in the left without being seen rate) and seek additional services when necessary. Accordingly, the Proposed Project may reduce ED revisits, inpatient readmissions and will allow clinical staff to refer or link patients to additional community services that will facilitate improved health outcomes.

F2.c. **Delivery System Transformation:**
Because the integration of social services and community-based expertise is central to goal of delivery system transformation, discuss how the needs of their patient panel have been assessed and linkages to social services organizations have been created and how the social determinants of health have been incorporated into care planning.

As outlined in Section F.1.B.ii, MGH has numerous programs in place to ensure linkages to social service organizations, such as through the iCMP for high-risk, chronically ill patients. Additionally, as part of the transition to the MassHealth ACO model of care, the Applicant and MGH have implemented a universal screening program for SDoH. This includes screening for: housing, food insecurity, finances, childcare, transportation, and literacy. Staff have developed workflows to connect patients to internal and external resources if the patient screens positive in any of the SDoH domains.

Factor 5: Relative Merit

F5.a.i **Describe the process of analysis and the conclusion that the Proposed Project, on balance, is superior to alternative and substitute methods for meeting the existing Patient Panel needs as those have been identified by the Applicant pursuant to 105 CMR 100.210(A)(1). When conducting this evaluation and articulating the relative merit determination, Applicant shall take into account, at a minimum, the quality, efficiency, and capital and**

operating costs of the Proposed Project relative to potential alternatives or substitutes, including alternative evidence-based strategies and public health interventions.

Proposal: Expand and relocate a secured unit for behavioral health patients to provide expanded capacity and renovate the vacated space and surrounding areas to improve capacity for emergent care.

Quality: The Proposed Project is a superior alternative for providing high quality ED and behavioral health services and improving health outcomes for patients. The renovation of ED services and the expansion of behavioral health services will allow patients to receive timely diagnosis and treatment for urgent and emergent medical and mental health conditions.

Efficiency: Currently, physical plant constraints cause operational inefficiencies in the ED. The ED has very limited space due to increases in demand, hampering throughput and causing delays, which frequently lead to overcrowding. Consequently, the discharge process is constrained, leading to longer lengths of stay and dissatisfaction by patients with their overall care experience. Through the Proposed Project, wait times for ED services will be reduced, creating greater throughput by renovating 9,500 square feet of clinical space and moving behavioral health patients to a secured unit.

Capital Expense: The proposed renovation of the ED and expansion of APS represents a cost-effective project as MGH staff have worked with the architects and the design team to implement a cost-effective expansion.

Operating Costs: Maintaining the ED in its current state will continue to present operational inefficiencies, including administrative costs associated with inefficient patient throughput. The Proposed Project will eliminate these inefficiencies, leading to stabilized operating costs.

List alternative options for the Proposed Project:

Option 1

Alternative Proposal: Sustain the current ED clinical space at MGH, leaving the existing APS area in the ED with 6 bays for treatment and eliminate redesign processes to create greater throughput.

Alternative Quality: This is not a feasible solution as this alternative would not allow for behavioral health patients to receive timely treatment. Additionally, this alternative would ensure long wait times in the ED for all patients, decreasing patient satisfaction and impacting the overall care experience, including poor health outcomes.

Alternative Efficiency: No operational efficiencies can be created by sustaining the current space and infrastructure.

Alternative Capital Expenses: Although there would be no capital expenses associated with this alternative, this option will not allow the Hospital to meet the needs of its patient panel.

Alternative Operating Costs: Operating costs will be impacted due to inefficiencies, leading to longer lengths of stay. By treating behavioral health patients in areas that

were not exclusively built for the treatment of psychiatric patients, MGH staff must mitigate risks by having additional ancillary resources, such as sitters, extra security and additional care providers on hand, leading to increased operating expenses.

ENDOSCOPY RENOVATION AND EXPANSION

Factor 1: Applicant Patient Panel Need, Public Health Values and Operational Objectives

F1.a.i **Patient Panel:**
Describe your existing Patient Panel, including incidence or prevalence of disease or behavioral risk factors, acuity mix, noted health disparities, geographic breakdown expressed in zip codes or other appropriate measure, demographics including age, gender and sexual identity, race, ethnicity, socioeconomic status and other priority populations relevant to the Applicant's existing patient panel and payer mix.

A. Partners HealthCare Patient Panel

Partners HealthCare is a not-for-profit, integrated health care system that was formed in 1994 by an affiliation between The Brigham Medical Center, Inc. (now known as Brigham Health) and The Massachusetts General Hospital. Partners HealthCare currently operates two tertiary hospitals, six community acute care hospitals, and one acute care specialty hospital in Massachusetts; one community acute care hospital in Southern New Hampshire; one facility providing inpatient and outpatient mental health services; and three facilities providing inpatient and outpatient services in rehabilitation medicine and long-term care. Partners HealthCare also operates physician organizations and practices, a home health agency, nursing homes and a graduate level program for health professionals. Partners HealthCare is a non-university-based nonprofit private medical research enterprise and its academic medical centers are principal teaching affiliates of the medical and dental schools of Harvard University. Partners HealthCare provides its services to patients primarily from the Greater Boston area and eastern Massachusetts, as well as New England and beyond. Additionally, Partners HealthCare operates a licensed, not-for-profit managed care organization that provides health insurance products to the MassHealth Program (Medicaid), Commonwealth Care (a series of health insurance plans for adults who meet income and other eligibility requirements) and commercial populations.

Partners HealthCare serves a large and diverse patient panel as demonstrated by the utilization data for the 36-month period covering Fiscal Year ("FY") 16-18 and the preliminary data available for FY19.[1] Attachment 2 provides this demographic profile for Partners HealthCare in table form. The number of patients utilizing Partners HealthCare's services has increased[2] since FY16, with 1,377,250 unique patients in FY16, 1,403,853 unique patients in FY17 and 1,500,670 unique patients in FY18.[3] Preliminary data indicate that for the first six week of FY19

[1] Fiscal year October 1 – September 30. While preliminary data is available for FY19, annual comparisons are calculated using data for FY16-18 as the FY19 data is only for the first six weeks of the new fiscal year and will change over time.

[2] The methodology for aggregating Partners HealthCare's patient panel data has evolved into an automated process utilizing internal data resources. Initially, in 2017, when Partners HealthCare began developing its patient panel for Determination of Need applications, such as the Change of Ownership for Massachusetts Eye and Ear and the Substantial Capital Expansion for Brigham and Women's Hospital, staff manually aggregated the necessary data. However, since these submissions, Partners HealthCare staff have developed a new automated process that allows for the collection and amalgamation of system-wide data. This refined methodology allows staff to continuously monitor and improve the way that data are aggregated. Accordingly, between June 2018 and October 2018, staff further refined the data collection processes leading to a decrease of no more than 5% in overall patient counts for the system. Staff will continue to refresh and refine the process for aggregating data across the system, leading to more exact patient panel data.

[3] Entities include: Brigham and Women's Hospital, Brigham and Women's Faulkner Hospital, Massachusetts General Hospital, Newton-Wellesley Hospital, and North Shore Medical Center; Cooley Dickinson Hospital, Martha's Vineyard Hospital, McLean Hospital, and Nantucket Cottage Hospital (post-Epic data only); Massachusetts Eye and Ear Infirmary (outpatient post-Epic data only); Spaulding Rehabilitation Hospital (Telehealth, Partners Mobile Observation

Partners HealthCare had 398,563 unique patients. Partners HealthCare's patient mix consists of approximately 42% males and 58% females. The Massachusetts Center for Health Information and Analysis ("CHIA") reports that Partners HealthCare's patient panel represents 19% of all discharges in the Commonwealth.[4] The system's case mix adjusted discharge rate is 22%.[5]

Partners HealthCare has seen an increase in the number of patients it serves across all age cohorts between FY16 and FY18. Current age demographics show that the majority of the patients within Partners HealthCare's patient population are between the ages of 18-64 years of age (61.7-62.1% of the total patient population). Patients that are 65 and older also make up a significant portion of the total patient population (26.1-27.8% of the total patient population). Only 10.4-11.9% of Partners HealthCare's patients are between 0-17 years of age. Preliminary data for FY19 shows similar trends with regard to increases across age cohorts and cohort distribution.

Partners HealthCare's patient panel reflects a mix of races. Data based on patient self-reporting demonstrate that in FY18, 72.0% of the total patient population identified as White; 5.5% identified as African American or Black; 4.1% identified as Asian; 1.5% identified as Hispanic/Latino; 0.1% identified as American Indian or Alaska Native; and 0.1% identified as Native Hawaiian or Other Pacific Islander. Since patients were grouped into these categories based on how they self-identified,[6] there is a portion of the patient population (16.8% in FY18) that either chose not to report their race or identified as a race that did not align with the aforementioned categories. Therefore, it is important to note that the racial composition of Partners HealthCare's patient panel may be understated.

Partners HealthCare provides care to patients from a broad range of geographies including all fifty states. While Partners HealthCare's patient panel resides mainly in Eastern Massachusetts, there is a sizeable portion of the patient panel that resides outside of Massachusetts (10.3%, or 155,302 patients, in FY18). By applying the Department of Public Health's ("DPH") Health Service Area ("HSA") categories to FY18 data, 43.6% of Partners HealthCare's patients reside in HSA 4 (654,363 patients); 16.3% reside in HSA 6 (244,578 patients); 13.6% reside in HSA 5 (204,213 patients); 6.4% reside in HSA 3 (95,780 patients); 3.3% reside in HSA 2 (49,077 patients); 6.1% reside in HSA 1 (90,977 patients); 0.01% reside in MA but outside of HSAs 1-6 (45 patients); and the origin of 6,335 patients or 0.5% of the panel is unknown.

Unit, Home Hospital programs for GH and BWH, Stay Connected with GH, Lifeline, and CareSage programs are not included); Brigham and Women's Physicians Organization, Massachusetts General Physicians Organization, Newton-Wellesley Medical Group, and North Shore Physicians Group; Cooley Dickinson PHO (post-Epic data only); and Partners Community Physicians Organization (pre-Epic non-risk patients not included).

[4] *Fiscal Year 2015: Partners HealthCare System*, MASSACHUSETTS CTR. FOR HEALTH INFORMATION ANALYSIS, http://www.chiamass.gov/assets/docs/r/hospital-profiles/2015/Partners-HealthCare-System.pdf (last visited Mar. 29, 2019).

[5] *Id.*

[6] With the exception of the category "Hispanic/Latino," the race categories shown above are based on the 1997 Office of Management and Budget standards on race and ethnicity. Patients were grouped into these categories based on their responses as follows – White: "White"; African American or Black: "African American", "Black", "Black or African American"; American Indian or Alaska Native: "American Indian", "American Indian or Alaska Native"; Asian: "Asian"; Native Hawaiian or Other Pacific Islander: "Native Hawaiian or Other Pacific Islander", "Native Hawaiian/Other Pacific Islander", "Pacific Islander"; Hispanic/Latino: "Hispanic"," Hispanic or Latino"," Latino"; Other/Unknown: All other responses.

B. Massachusetts General Hospital Patient Panel

Massachusetts General Hospital ("MGH") is one of the founding members of Partners HealthCare and the original teaching hospital of Harvard Medical School. With 1,035 licensed beds at its main campus in Boston, MGH is the largest hospital in the state. In addition to its main hospital campus in Boston, MGH offers services to patients through various hospital satellite and clinic locations across Eastern Massachusetts.

Overall Patient Panel

Attachment 2 provides the demographic profile for MGH in table form. Similar to Partners HealthCare, the number of patients utilizing MGH increased from FY16-FY18 and in FY19-year-to-date ("YTD"), with 563,470 unique patients in FY16, 563,976 unique patients in FY17, and 566,357 unique patients in FY18. In the first six week of FY19, MGH had 149,595 unique patients. Of these patients, approximately 44% are male and 56% are female.

In regard to age, the majority of MGH's patients are between the ages of 18-64 (59.3%, or 335,741 patients in FY18). The next largest age cohort is patients that are 65 years and older (26.4%, or 149,588 patients, in FY18). Subsequently, 14.3% of MGH's patients are between ages 0-17 (81,023 patients in FY18).

Moreover, MGH's patients reflect a diversity of races. Data based on patient self-reporting demonstrate that in FY18, 73.0% of patients identified as White; 5.2% identified as African American or Black; 5.2 identified as Asian; 0.8% identified as Hispanic/Latino; 0.1% identified as American Indian or Alaska Native; and 0.1% identified as Native Hawaiian or Other Pacific Islander. Since patients were grouped into these categories based on how they self-identified,[7] there is a portion of the patient population (15.7% in FY18) that either chose to not report their race or identified as a race that did not align with the above categories. Therefore, it is important to note that the racial composition of MGH's patients may be understated.

Finally, aggregated zip code data by HSA for FY18 demonstrate that MGH's patient population has a similar geographic composition to the larger Partners HealthCare patient panel. These data indicate that 49.2% of MGH's patients resided in HSA 4 (278,900 patients); 17.3% resided in HSA 6 98,075 patients); 8.6% resided in HSA 5 (48,576 patients); 5.8% resided in HSA 3 (32,725 patients); 3.2% resided in HSA 2 (18,211 patients); 1.3% resided in HSA 1 (7,174 patients). Over 79,819 patients or 14.1% of the panel was from outside of Massachusetts, and the origin of 0.5% of the panel was unknown.

Endoscopy Patient Panel

MGH's Division of Gastroenterology ("GI Division") offers comprehensive, leading-edge care for patients with all types of digestive diseases, from heartburn to organ failure. The Hospital's collaborative practice of gastroenterologists and endoscopists are dedicated to the prevention, diagnosis, treatment and management of digestive diseases. Possessing expertise in all

[7] With the exception of the category "Hispanic/Latino", the race categories shown above are based on the 1997 Office of Management and Budget standards on race and ethnicity. Patients were grouped into these categories based on their responses as follows – White: "White"; African American or Black: "African American", "Black", "Black or African American"; American Indian or Alaska Native: "American Indian", "American Indian or Alaska Native"; Asian: "Asian"; Native Hawaiian or Other Pacific Islander: "Native Hawaiian or Other Pacific Islander", "Native Hawaiian/Other Pacific Islander", "Pacific Islander"; Hispanic/Latino: "Hispanic"," Hispanic or Latino"," Latino"; Other/Unknown: All other responses.

aspects of digestive health, MGH's multidisciplinary team of specialists offers patients the benefit of an individualized treatment plan.

In 2018, the GI Division was ranked eighth in the country by *US News and World Report*, making it the highest ranked GI practice in New England. Regionally, MGH's GI Division performs the greatest number of procedures related to digestive health, including diagnosis and treatment of diseases and conditions of the esophagus, stomach, small and large intestine, liver, gallbladder, pancreas and colon. MGH's board-certified specialists offer depth of experience and skill in using conventional, innovative and investigational methods to diagnose and manage both common conditions and more complex diseases, with excellent clinical outcomes.

Moreover, the GI Division is committed to applying the latest research findings in clinical practice to diagnose and treat conditions throughout the entire digestive system. The GI Division is actively involved in research programs, allowing the hospital to provide cutting-edge therapies and clinical trials to patients. MGH's Crohn's and Colitis Center is a designated National Institute of Diabetes and Digestive and Kidney Disease ("NIDDK") – Digestive Disease Research Center. The Hospital offers highly sought-after advanced fellowships in inflammatory bowel disease, hepatology, obesity medicine, GI motility, and interventional endoscopy.

Due to MGH's commitment to excellence, the Hospital experiences a high demand for GI services. In FY16, MGH treated 22,941 unique patients (29,139 visits) for GI services. This number increased to 23,217 unique patients in FY17 (29,496 visits) and rose again to 23,884 unique patients (27,073 visits) in FY18. For the first quarter of FY19, 6,143 unique patients (6,471 patients) had GI services.

Aggregated zip code data by HSA for the last three fiscal years demonstrate that MGH's GI patient population had a similar geographic composition to the larger Partners HealthCare patient panel. These data indicate that in FY18, 58% of MGH's GI patients resided in HSA 4 (13,810 patients); 14% resided in HSA 6 (3,290 patients); 9% resided in HSA 5 (2,139 patients); 6% resided in HSA 3 (1,414 patients); 3% resided in HSA 2 (684 patients); 1% resided in HSA 1 (234 patients); and 2,203 patients or 9% of the panel in FY18 was from outside of Massachusetts. These trends in geography are similar for FY16, FY17, as well as the first quarter of FY19.

With respect to age, 61% of patients that used MGH's GI services in FY18 were in the 18-64 age cohort. For this same timeframe, over a third of patients or 33% were in the 65+ age cohort and 6% were in the 0-17 age cohort. Of the 6,143 patients treated by MGH's GI Division in the first quarter of FY19, 59% of patients were in the 18-64 age cohort, 35% were in the 65+ age cohort and 6% were in the 0-17 age cohort. These data reflect similar patterns in patient trends for FY16 and FY17.

Patients that utilize MGH's GI services also reflect a mix of races. Data based on patient self-reporting demonstrate that in FY18, 80% of MGH's GI patients identified as White or Caucasian; 5% identified as African American or Black; and 5% identified as Asian. Additionally, in terms of ethnicity, 1% of patients identified as Hispanic or Latino. Patients were grouped into these categories based on how they self-identified;[8] as such, there is a portion of the patient

[8] With the exception of the category "Hispanic/Latino", the race categories shown above are based on the 1997 Office of Management and Budget standards on race and ethnicity. Patients were grouped into these categories based on their responses as follows – White: "White"; African American or Black: "African American", "Black", "Black or African American"; American Indian or Alaska Native: "American Indian", "American Indian or Alaska Native"; Asian: "Asian";

population (9% in FY18) that either chose to not report their race or identified as a race that did not align with the above categories. Therefore, it is important to note that the racial composition of MGH's GI patients may be understated.

The gender breakdown for patients that utilized MGH's GI services was: 52% female and 48% male in FY18. Patients were categorized as male or female based on self-identification, and 0% (2 patients) identified as other. This ratio of female to male patients is similar to historical data from FY16 and FY17.

In a review of underlying conditions associated with endoscopy patients at MGH for the last three fiscal years and the first quarter of FY19, the most prevalent diagnoses were: (1) Other; (2) Encounter for screening for malignant neoplasm of the colon; (3) Benign neoplasm of the transverse colon; (4) Benign neoplasm of the ascending colon; (5) Benign neoplasm of the sigmoid colon; (6) Benign neoplasm of the descending colon; (7) Other diseases of the stomach and duodenum; (8) Benign neoplasm of the cecum; (9) Gastro-esophageal reflux disease without esophagitis; (10) Diverticulosis of the large intestine without perforation or abscess without bleeding; and (11) Epigastric pain. The breakdown of patients with each of these conditions may be found in Attachment 2.

F1.a.ii **Need by Patient Panel:**

Provide supporting data to demonstrate the need for the Proposed Project. Such data should demonstrate the disease burden, behavioral risk factors, acuity mix, health disparities, or other objective Patient Panel measures as noted in your response to Question F1.a.i that demonstrates the need that the Proposed Project is attempting to address. If an inequity or disparity is not identified as relating to the Proposed Project, provide information justifying the need. In your description of Need, consider the principles underlying Public Health Value (see instructions) and ensure that Need is addressed in that context as well.

A. Need for Increased Availability of Endoscopy Services

MGH's Endoscopy Unit ("surgical area" or "clinical space") requires renovation and expansion to address physical plant constraints that impact access to care. The demand for services, surgical intervention methodologies and care processes for patients requiring endoscopy services have substantially changed in the 20 years since the existing clinical space opened. The clinical space cannot accommodate the latest technological devices for certain endoscopic procedures due to size, leaving the Hospital unable to offer certain minimally invasive procedures. Accordingly, through the Proposed Project, MGH will address capacity constraints in the Endoscopy Unit by increasing the total number of procedure rooms from ten to thirteen, with four rooms equipped as IR/Fluoro rooms and nine rooms serving as general procedure rooms. These renovated and new procedure rooms will allow clinicians to perform interventional and routine endoscopy. MGH also will expand the pre-and post-procedural space in the Endoscopy Unit from 21 to 31 bays, allowing for greater privacy as current overcrowding frequently leads to a negative impact on patient experience. Other renovations to the clinical space include the creation of dedicated provider workstations for fellows, nurse practitioners and on-call physicians; centralized workstations for resource nurses; and the relocation of the scope

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Native Hawaiian or Other Pacific Islander: "Native Hawaiian or Other Pacific Islander", "Native Hawaiian/Other Pacific Islander", "Pacific Islander"; Hispanic/Latino: "Hispanic"," Hispanic or Latino"," Latino"; Other/Unknown: All other responses.

cleaning and reprocessing area to MGH's Central Sterile Processing unit. These renovations will allow the Hospital to maximize the clinical space on the floor and redesign patient throughput, leading to greater efficiencies in care processes, including reduced wait times for discharge and an overall shorter length of stay for patients.

Increased Need for Endoscopy Services by an Aging Patient Panel

By 2050, the number of U.S. older adults, defined as persons aged 65 and over, is expected to more than double, rising from 40.2 million to 88.5 million individuals.[9] Higher rates of GI disease among this older population are driving demand for endoscopy services as these types of procedures are commonly performed on older adults to diagnose and treat GI conditions. [10] GI cancers are among the disorders that disproportionately effect the 65+ age cohort. For this population, pancreatic, liver and colorectal cancer incidences are on the rise. Advancing age is a high risk factor for cancer, and more than 60% of new cancer cases and over 70% of cancer mortalities occur in the elderly population each year."[11] With over 55,000 new cases of pancreatic cancer diagnosed annually in the US, this disease is the fourth leading cause of cancer-related death. Furthermore, the incidence of pancreatic cancer increases with age; in the United States, 87% of all patients with pancreatic cancer are diagnosed after the age of 60.[12] Rates of liver cancer also are increasing for those 65 and older with a 37% increase in the age-adjusted death rate for these adults from 2008 to 2016.[13] The death rate from liver cancer for individuals 75 and older was 35% in 2016.[14] In addition, colonoscopy, a specific type of endoscopic procedure, is often accepted as the "gold standard" for detecting colon cancer. Given that the incidence of colorectal cancer increases with age, colonoscopy plays a major role in cancer detection, especially for patients in the 65-75 age cohort, who are less susceptible to complications and more likely to seek treatment if an issue is found. Consequently, the need for endoscopic procedures to diagnose and treat these oncologic conditions is increasing with the aging population.

A number of other conditions that are more prevalent in the 65+ age cohort also increase demand for endoscopy services. For example, approximately 35% of adults aged 65+ are obese, representing over 8 million adults aged 65–74, and almost 5 million adults aged 75+.[15] The number of obese individuals within the US is expected to increase in the coming years, leading many of these individuals to need and receive novel endoscopic devises to address their condition.[16] Moreover, nonalcoholic fatty liver disease ("NAFLD") often requires endoscopy services. NAFLD is the build-up of extra fat in liver cells that is not caused by alcohol.[17] Affecting over 100 million individuals in the US, it is most common in the 65+ age cohort, "in whom it carries a more substantial burden of hepatic (nonalcoholic steatohepatitis, cirrhosis and hepatocellular carcinoma) and extra-hepatic manifestations and complications (cardiovascular

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[9] *Prevalence of Obesity Among Older Adults in the United States, 2007-2010,* CTRS. FOR DISEASE CONTROL AND PREVENTION, https://www.cdc.gov/nchs/data/databriefs/db106.pdf (Sept. 2012).
[10] Anne Travis et al, *Endoscopy in the Elderly,* 107 AM. J. GASTROENTEROLOGY 1495–1501 (Aug. 7, 2012).
[11] Oliver Higuera et al, *Management of pancreatic cancer in the elderly*, 22 WORLD J. OF GASTROENTEROLOGY 2, 764-75 (Jan. 14, 2016).
[12] *Id.*
[13] *Prevalence of Obesity Among Older Adults in the United States, 2007-2010, supra* note 9.
[14] *Prevalence of Obesity Among Older Adults in the United States, 2007-2010, supra* note 9.
[15] *Prevalence of Obesity Among Older Adults in the United States, 2007-2010, supra* note 9.
[16] *Prevalence of Obesity Among Older Adults in the United States, 2007-2010, supra* note 9.
[17] *Non-Alcoholic Fatty Liver Disease,* AM. LIVER FOUNDATION, https://liverfoundation.org/for-patients/about-the-liver/diseases-of-the-liver/non-alcoholic-fatty-liver-disease/ (last visited Mar. 29, 2019).

disease and extrahepatic neoplasms) than in younger age groups."[18] [19] Historically, NAFLD was thought to be of little importance, but recent advances have uncovered that fatty liver disease can lead to end stage liver disease, cirrhosis and liver cancer.[20] With incidence of NAFLD growing steadily each year, it is estimated that by the year 2020 fatty liver disease will be the leading reason for liver transplants in the US.[21] MGH offers evaluation, diagnosis and treatment plans for patients with this disease, with endoscopy being an important tool in providing care.

Currently, patients in the 65+ age cohort account for approximately one-third of the patients that obtain endoscopy services from MGH. Accordingly, the proposed expansion and renovation of MGH's Endoscopy Unit will allow the Hospital to address the needs of its aging patient panel and provide improved access to endoscopy services that address various digestive diseases and conditions. According to the University of Massachusetts' Donahue Institute's ("UMDI") *Long-Term Population Projections for Massachusetts Regions and Municipalities*, the statewide population is projected to grow a total of 11.8% from 2010 through 2035.[22] An analysis of UMDI's projections shows that the growth of the Commonwealth's population is segmented by age sector, and that within the next 20 years, the bulk of the state's population growth will cluster around residents that are age fifty (50) and older.[23] Moreover, between 2015 and 2035, the Commonwealth's 65+ population is expected to increase at a higher rate compared to all other age cohorts.[24] By 2035, the 65+ age cohort will represent approximately a quarter of the Massachusetts population.[25] This general trend of growth appears consistent across MGH's patient panel with the number of patients in need of endoscopic procedures growing each year of the last three fiscal years. As the number of patients that fall into the 65+ age cohort for MGH continues to grow, the demand for endoscopy services is expected to increase given that age is one of the largest risk factors for Gi disorders.

Projected Demand for Endoscopy Services

Monthly, the GI Division receives over 1,600 external referrals for endoscopy services. In addition to this volume, MGH's GI providers produce another 500 or more requests per month for endoscopy services from current or previous patients. With demand for endoscopy projected to increase in the coming years due to an aging patient panel and new innovations in surgical

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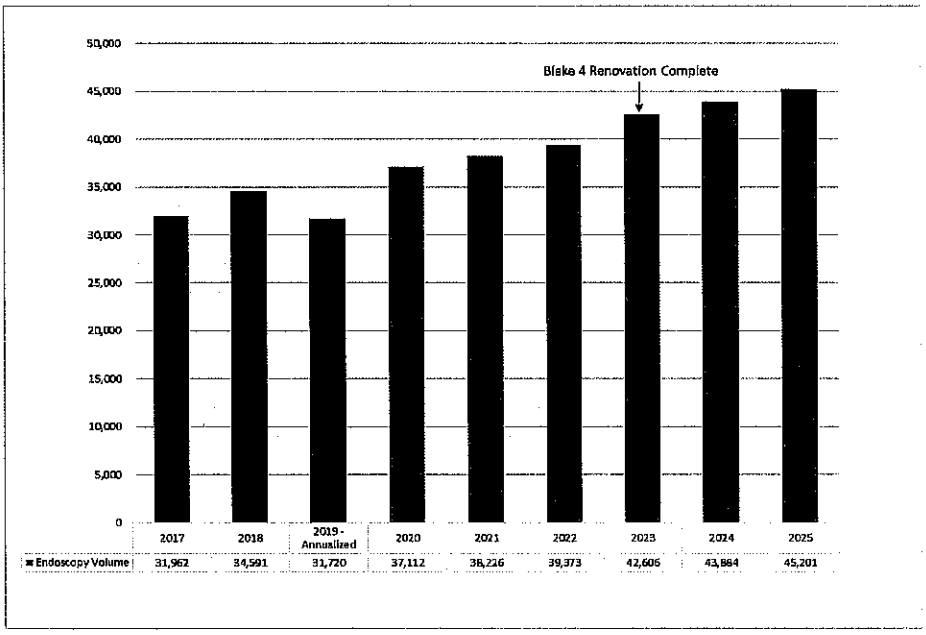
[18] M. Bertolotti et al, *Nonalcoholic fatty liver disease and aging: epidemiology to management,* 20 WORLD J. OF GASTROENTEROLOGY (39), 14185-204 (Oct. 21, 2014).
[19] *Non-Alcoholic Fatty Liver Disease, supra* note 17.
[20] *Fatty Liver Clinic,* MASSACHUSETTS GENERAL HOSPITAL GASTROENTEROLOGY, https://www.massgeneral.org/gastroenterology/services/fatty_liver_clinic.aspx?display=home (last visited Mar. 29, 2019).
[21] *Fatty Liver Clinic, supra.*
[22] LONG-TERM POPULATION PROJECTIONS FOR MASSACHUSETTS REGIONS AND MUNICIPALITIES, UNIVERSITY OF MASSACHUSETTS DONAHUE INSTITUTE 11 (Mar. 2015), *available at* http://pep.donahue-institute.org/downloads/2015/new/UMDI_LongTermPopulationProjectionsReport_2015%2004%20_29.pdf. The Massachusetts Secretary of the Commonwealth contracted with the University of Massachusetts Donahue Institute ("UMDI") to produce population projections by age and sex for all 351 municipalities. *Id.* at 7. Within the past five years, Massachusetts has been experiencing an increase in the population growth rate per year due to high immigration and low domestic outflow, which is expected to slow down in 2030. *Id.* at 12.
[23] *Massachusetts Population Projections – EXCEL Age/Sex Details*, UNIVERSITY OF MASSACHUSETTS DONAHUE INSTITUTE (2015), http://pep.donahue-institute.org/downloads/2015/Age_Sex_Details_UMDI_V2015.xls. This data has been extracted for counties where current Partners HealthCare hospitals and affiliates are located. *Id.*
[24] LONG-TERM POPULATION PROJECTIONS FOR MASSACHUSETTS REGIONS AND MUNICIPALITIES, *supra* note 17 at 14. The report uses the cohorts as defined by the U.S. Census Bureau 2010 Census Summary, which are 0-19, 20-39, 40-64, and 65+. *Id.* Figure 2.5 in the report demonstrates that where the 65+ cohort increases from 2015 to 2035; all other cohorts are predicted to decrease. *Id.*
[25] LONG-TERM POPULATION PROJECTIONS FOR MASSACHUSETTS REGIONS AND MUNICIPALITIES, *supra* note 17 at 14.

interventions, MGH must address its capacity constraints to ensure patients have access to these diagnostic and treatment services. Table 1 below outlines historical volume trends for endoscopy procedures, as well as future demand for these services. Table 1 illustrates that demand for endoscopy services continues to increase in the coming years. In 2019, MGH did experience a slight decrease in endoscopy volume due to the loss of clinical staff. However, between 2019 and 2020, volume will increase by nearly 17% due to the addition of new faculty members. This increase in volume is outlined in Table 1.

Table 1: Endoscopy Services Volume Projections at MGH



F1.a.iii **Competition:**

Provide evidence that the Proposed Project will compete on the basis of price, total medical expenses, provider costs, and other recognized measures of health care spending. When responding to this question, please consider Factor 4, Financial Feasibility and Reasonableness of Costs.

The Proposed Project will not have an adverse effect on competition in the Massachusetts healthcare market based on price, TME, provider costs or other recognized measures of health care spending. The evolution of endoscopy from a purely diagnostic tool to a therapeutic resource has impacted its use in a considerable way.[26] Advances in endoscopic techniques, such as endoscopic retrograde cholangio-pancreatography ("ERCP"), endoscopic ultrasound ("EUS"), and enteroscopy have turned the endoscopic pathway into an alternative to surgery for some pathologies."[27] A comparative study on the differences in costs between endoscopic procedures and corresponding surgical alternatives indicates that out of the 33 advanced

[26] C. Loras et al, *Study of the standard direct costs of various techniques of advanced endoscopy. Comparison with surgical alternatives*, 50 DIGESTIVE AND LIVER DISEASE 7, 689-698 (July 2018).
[27] *Id.*

endoscopic procedures reviewed – 57% of the time, the cost of the endoscopic procedure was anywhere from two to five times less than the costs for the equivalent surgical alternative.[28] Moreover, studies have found that these endoscopic techniques are as therapeutic (and in some cases may even be more therapeutic) than the analogous surgery, with fewer side effects and less complications.[29] Patients experiencing fewer complications have lower rates of readmission, fewer physician visits and faster recovery periods. Accordingly, endoscopy is considered a lower-cost alternative than traditional surgical options for many applications, lowering provider costs, payer costs, and out-of-pocket expenses for patients, leading to an overall reduction in TME, while achieving high quality outcomes.

In addition, when endoscopy is used as a screening and diagnostic tool, as in the case of colonoscopy, GI disorders such as colorectal cancer may be detected in the disease's early stages. According to the American Cancer Society when cancer is found in its earliest stages, with no opportunity to spread, patients have more cost-effective treatment options and better survival rates.[30] For example, when colorectal cancer is found at an early stage (prior to metastases), the 5-year survival rate is approximately 90% with minimal clinical interventions. Preventative care, such as screenings through colonoscopy lead to early detection and thereby a reduction in the utilization of healthcare services. Consequently, when treatment is timely and appropriate, cost efficiencies are created leading to a reduction in overall services and costs, directly impacting TME.

F1.b.i **Public Health Value /Evidence-Based:**
Provide information on the evidence-base for the Proposed Project. That is, how does the Proposed Project address the Need that Applicant has identified.

A. MGH's Proposed GI Renovation and Expansion

To address capacity constraints, MGH developed a renovation and expansion plan for the Endoscopy Unit that will increase procedural and peri-procedural space, create concentric circles of multi-disciplinary care, concentrate highly specialized and complex care on the Hospital's main campus, and significantly enhance patient experience. The proposed expansion and renovation of GI services, specifically endoscopy, is supported by extensive literature related to evidence-based strategies for addressing digestive health diseases and conditions.

Endoscopy: Background Information

Endoscopy is a nonsurgical procedure using an endoscope, a flexible tube with a light and camera attached to it, to examine a patient's digestive tract.[31] Endoscopy allows doctors to view and operate on the internal organs without making large incisions and is most commonly used to help determine the cause of GI symptoms, to remove a small sample of tissue for biopsy, and/or to guide physicians during surgical procedures.[32] Endoscopic procedures are generally performed one of two ways; during an upper endoscopy, the endoscope is passed through the mouth and into the esophagus, providing a view of the esophagus, stomach, and upper part of

[28] *Id.*
[29] *Id.*
[30] *Can Colorectal Polyps and Cancer Be Found Early?,* AM. CANCER SOC'Y, https://www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/detection.html (last revised Feb. 21, 2018).
[31] *Upper GI Endoscopy,* NAT'L INSTITUTE OF DIABETES AND DIGESTIVE AND KIDNEY DISEASES, https://www.niddk.nih.gov/health-information/diagnostic-tests/upper-gi-endoscopy (last revised July 2017).
[32] *Endoscopy,* HEALTHLINE, https://www.healthline.com/health/endoscopy (last visited Mar. 29, 2019).

the small intestine.[33] During a lower endoscopy or colonoscopy, the endoscope is passed through the rectum into the large intestine to examine the colon.[34] Colonoscopy can show irritated and swollen tissue, ulcers, polyps and cancer.[35] ERCP" is used to obtain images of the pancreas and gallbladder, to place stents, and to obtain biopsies. EUS combines endoscopy and ultrasound technology to obtain images of the digestive tract.[36] Other endoscopy technologies include capsule endoscopy, where a patient swallows a small pill with a camera inside to take images of the intestines as it moves through the digestive tract; chromoendoscopy, a technique that uses a specialized dye on the lining of the intestine to help doctors visualize abnormalities; endoscopic mucosal resection ("EMR"), a technique used to remove cancerous tissue in the digestive tract; and narrow band imaging ("NBI"), the use of a special filter to create contrast between the vessels and the mucosa, the inner lining of the digestive tract.[37]

Other types of endoscopic procedures, include colonoscopy, enteroscopy and sigmoidoscopy and esophageal manometry. Colonoscopy is used as a screening tool to check the entire colon and large intestine for colorectal polyps or cancer, as well as a diagnostic tool for patients who have bleeding from the anus, changes in bowel activity, pain in the abdomen, and unexplained weight loss, and is recommended for all adults aged 50 and older, as well as anyone with parents, siblings, or children with a history of colorectal cancer or polyps. A colonoscopy shows irritated and swollen tissue, ulcers, and polyps, which doctors may remove for biopsy during the procedure. Removal of polyps can prevent colorectal cancer, which is frequently not diagnosed until the disease is advanced. Enteroscopy is the examination of the small intestine and provides a more extensive view of the small-bowel than that provided from a colonoscopy. Enteroscopes often have an apparatus attached, such as an overtube or small balloon, and are used to reach less accessible parts of the colon. Enteroscopy is generally used for the evaluation of the source of GI bleeding not identified by colonoscopy, localization of known or suspected small-bowel lesions, and tissue sampling form the small bowel.

Flexible sigmoidoscopy is used to examine the lower part of the colon (sigmoid colon), and as with colonoscopy, is used to determine causes of abdominal pain, rectal bleeding, changes in bowel habits, and other intestinal problems.[38] Sigmoidoscopy is also used to screen for colorectal cancer. Although this procedure does not provide a complete view of the colon, it is occasionally preferred over colonoscopy as it takes less time to perform, frequently does not require an anesthetic, and is associated with lower risk of harm, such as perforation, when compared with colonoscopy.[39]

Esophageal manometry is a test that examines the esophagus and provides information about the motility, or movement of food.[40] Used to examine the bands of muscle at the top and bottom of the esophagus, esophageal manometry shows the pressure, strength, and wave pattern of the esophageal muscle's contractions that move food through the esophagus and into the

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[33] *Endoscopic Procedures,* AM .SOC'Y FOR GASTROINTESTINAL ENDOSCOPY, https://www.asge.org/home/about-asge/newsroom/media-backgrounders-detail/endoscopic-procedures (last reviewed Aug. 2014).
[34] *Id.*
[35] *Colonoscopy,* NAT'L INSTITUTE OF DIABETES AND DIGESTIVE AND KIDNEY DISEASES, https://www.niddk.nih.gov/health-information/diagnostic-tests/colonoscopy (last revised July 2017).
[36] *Id.*
[37] *Endoscopy, supra* note 32.
[38] *Flexible sigmoidoscopy,* MAYO CLINIC, https://www.mayoclinic.org/tests-procedures/flexible-sigmoidoscopy/about/pac-20394189 (Oct. 25, 2018).
[39] *Id.*
[40] *Esophageal manometry,* MAYO CLINIC, https://www.mayoclinic.org/tests-procedures/esophageal-manometry/about/pac-20394000 (June 8, 2018).

stomach.[41] Esophageal manometry is used to diagnose esophageal spasm, a swallowing problem; achalasia, a condition that prevents food from entering the stomach; and scleroderma, a progressive disease that causes the muscles in the lower esophagus to stop moving, leading to severe gastroesophageal reflux.[42]

Endoscopy: Use as a Screening and Diagnostic Tool

When endoscopy is used as a screening tool, as in the case of colonoscopy, clinicians are able to identify conditions in the early stages of a disease and delay or prevent further development of the disease.[43] In contrast to diagnostic tests, screening tests evaluate individuals that have a low pretest probability of a particular disease. These individuals are either asymptomatic or are at preclinical stages of their disease.[44] Thus, colonoscopy is considered the "gold standard" in detecting colorectal cancer. Moreover, endoscopy is frequently used as a diagnostic tool to evaluate stomach pain, ulcers, gastritis, digestive tract bleeding, changes in bowel habits, and polyps or growths in the colon.[45] Studies have shown that upper endoscopy is more accurate than x-rays in detecting abnormal growths, such as cancer, and is more accurate for examination of the upper digestive system.[46] Upper endoscopy may also be used to identify and remove polyps, or to dilate or stretch narrowed areas of strictures of the esophagus, stomach, or duodenum that result from cancer or other diseases.[47]

Endoscopy: Use as a Treatment Tool

Therapeutic endoscopy is an endoscopic procedure during which treatment is carried out. Advances in therapeutic and interventional endoscopy over the last three decades have made a substantial impact on treating various conditions.[48] Endoscopic therapy is "the most effective form of treatment in stopping hemorrhage from actively bleeding lesions and has reduced the need for emergency bowel resection."[49] Moreover, endoscopic placement of stents for "the treatment and palliation of benign and malignant strictures involving the esophagus, duodenum, and colorectal regions of the gastrointestinal tract have shown to be more efficacious, cost-effective, and associated with less morbidity and mortality.[50] Accordingly, these important treatment advances are used to address GI conditions and disease.

F.1.b.ii **Public Health Value /Outcome-Oriented:**
Describe the impact of the Proposed Project and how the Applicant will assess such impact. Provide projections demonstrating how the Proposed Project will improve health outcomes, quality of life, or health equity. Only measures that can be tracked and reported over time should be utilized.

[41] *Id.*
[42] *Id.*
[43] T.H. Ro et al, *Value of screening endoscopy in evaluation of esophageal, gastric and colon cancers.* 21 WORLD J. OF GASTROENTEROLOGY, 33, 9693-706 (Sept. 7, 2015).
[44] *Id.*
[45] *Colorectal Cancer Screening,* AM. SOC'Y FOR GASTROINTESTINAL ENDOSCOPY, https://www.asge.org/home/about-asge/newsroom/media-backgrounders-detail/colorectal-cancer-screening (last reviewed July 2017).
[46] *Id.*
[47] *Id.*
[48] *Endoscopic Therapy,* SCIENCEDIRECT, https://www.sciencedirect.com/topics/medicine-and-dentistry/endoscopic-therapy (last visited Mar. 29, 2019).
[49] *Id.*
[50] *Id.*

A. Expansion of Endoscopy Services at MGH's Main Campus: Improving Health Outcomes and Quality of Life

MGH anticipates that the Proposed Project will provide its patients with improved health outcomes, improved quality of life, and additional access to high quality endoscopy services by expanding endoscopy capacity at its main campus. As more fully discussed in Factor F.1.b.i., the expansion and renovation of the Endoscopy Unit at MGH will improve access to treatment options, including innovative endoscopic procedures and devices; reduce wait times for procedures; and ensure higher quality outcomes. Endoscopy is used as a diagnostic tool, as well as an alternative to open surgery for some conditions. When endoscopy is used as a screening or diagnostic tool, various conditions are identified expeditiously, leading to timely treatment and improved quality outcomes. When endoscopy is performed rather than a corresponding open surgery, patients tend to have smaller or fewer incisions; less pain, lower risk of infection; shorter hospital stays; quicker recovery times; less scarring and a reduced loss of blood.[51] Consequently, endoscopic procedures frequently have fewer side effects and less complications for patients, leading to improved quality outcomes, while shorter recovery periods lead to improved quality of life for patients and their families.[52] [53]

Moreover, the expansion and renovation of MGH's Endoscopy Unit will also impact patient experience. Current physical plant constraints cause overcrowding in the perioperative space, thereby impacting patient privacy and satisfaction. Frequently, patients have longer lengths of stay (due to overcrowding) constraining discharge processes. Through the Proposed Project, MGH will eliminate the space constraints that are creating operational inefficiencies, leading to better patient throughput, as well as enhanced patient experience and higher levels of satisfaction.

B. Additional Strategies for Improving Patient Experience and Ensuring High Quality Outcomes for All Services at MGH

The Applicant and MGH are committed to developing and implementing population health management ("PHM") strategies to ensure high quality outcomes and an exceptional care experience for all patients. Currently, MGH is in the midst of a ten-year strategic plan aimed at improving patient experience and clinical quality outcomes, as well as reducing the costs associated with care. Every clinical department at MGH, including the GI Division, has a PHM strategy. Currently, high quality patient outcomes are achieved through these strategies, which are aimed at improving quality, efficiency and patient experience, such as care models that are rooted in collaboration, including patient-centered medical homes, care integration and other care initiatives specifically designed by MGH clinicians. Accordingly, MGH offers a number of programs to ensure quality care for patients.

First, MGH staff participate in the eConsult Program. Through the eConsult program PCPs and specialists, such as gastroenterologists and endoscopists, consult (as needed) through a non-face-to-face electronic interaction that seeks to ensure patients are receiving appropriate care services, while avoiding any unnecessary higher cost consultations. Through this program, primary care physicians ("PCPs") initiate an eConsult order through the hospital's electronic health record ("EHR"). Within three business days, for endoscopy patients, a PCP will be

[51] Loras, *supra* note 26.
[52] Loras, *supra* note 26.
[53] *Minimally Invasive Surgery,* JOHNS HOPKINS MEDICINE, https://www.hopkinsmedicine.org/minimally_invasive_robotic_surgery/types.html (last visited Mar. 29, 2019).

provided with structured guidance from a gastroenterologist on a particular question about a specific patient. Through this program, clinical decision support in the EHR and physician-level variation reporting minimize inappropriate ordering high-cost diagnostic tests by a PCP and ensure patients receive the care that they need.

Second for MGH's highest risk and most complex patients, clinical staff offer the Integrated Care Management program ("iCMP"). iCMP provides eligible patients with a care manager who develops a care plan in tandem with the patient and other members of the clinical team. The care manager works in-person and telephonically to coordinate a patient's care and ensures that patients are not readmitted to the hospital when possible. Additionally, the care manager connects patients with community based resources that are vital for recovery. MGH also offers the Integrated care management program, Patients Linked to Urgent Supports ("PLUS"). This program provides intensive wrap-around services (psycho-social supports) to a small number of patients. Services include acute community paramedicine, crisis stabilization units, and coordinated transportation. All of these programs assure that MGH's patients have the highest quality care, as well as a superior care experience.

Third, MGH offers alternative care pathways to patients, so they may avoid unnecessary visits to the emergency department or inpatient hospitalizations. The GI Division offers a Lower GI Bleed pathway for patients that are in need of urgent GI procedures and a post-discharge clinic for cirrhotic patients, so they may be seen immediately in order to avoid readmissions. Additionally, the Partners Mobile Observation Unit ("PMOU") is a program that provides home-based urgent care for patients experiencing at-risk medical events believed to be treatable with enhanced home care. Additionally, MGH's Home Hospital Program offers daily hospital-level care at home through team-based care.

Through the Proposed Project, the GI Division will offer these programs to patients, thereby ensuring improved quality outcomes for patients and a better overall patient experience. For all patients access to these critically needed services will allow them to receive appropriate and timely care, as well as address any social determinant of health challenges that a patient may be facing. By providing access to these PHM strategies, MGH provides holistic care, which in turn ensures higher quality outcomes.

C. Assessing the Impact of the Proposed Project

To assess the impact of the Proposed Project, MGH developed the following metrics and reporting schematic, as well as metric projections for process and quality indicators that will measure patient satisfaction, access and quality of care. The measures are discussed below:

1. **Satisfaction – Patient Satisfaction:** Patients that are satisfied with care are more likely to seek additional treatment when necessary. MGH staff will review the Access to Care metric with GI-Endoscopy via CG-CAPS scores.

   Measure: Access to Care – Response Options, include: Never/No, Sometimes, Usually, Always/Yes

   Projections: Baseline: 71.3%; Year 1: 71.8%; Year 2; 72.0%; and Year 3: 72.5%.

   Monitoring: Any category receiving a less than "Always/Yes" top box rating will be evaluated and policy changes instituted as deemed appropriate.

2. **Access – Reduction in Inpatient Case Delays:** This metric reviews delays in the start time of inpatient cases. This information will be obtained via MGH's electronic health record ("EHR") system, EPIC.

   Measure: Time interval between inpatient cases performed in the Endoscopy Unit.

   Projections: Baseline: 75 minutes; Year 1: 65 minutes; Year 2: 60 minutes; and Year 3: 50 minutes.

   Monitoring: Reviewed quarterly based on inpatient case data.

3. **Clinical Quality – Improved Patient Flow in the Endoscopy Unit.** This measure evaluates the total time a patient scheduled for an outpatient sedation case is in the Endoscopy Unit. This information will be obtained via MGH's EHR system, EPIC.

   Measure: Total patient time in the Endoscopy Unit measured from patient arrival to procedure.

   Projections: Baseline: 105 minutes; Year 1: 100 minutes; Year 2: 95 minutes; and Year 3: 90 minutes.

   Monitoring: Reviewed quarterly by clinical staff.

F1.b.iii **Public Health Value /Health Equity-Focused:**

For Proposed Projects addressing health inequities identified within the Applicant's description of the Proposed Project's need-base, please justify how the Proposed Project will reduce the health inequity, including the operational components (e.g. culturally competent staffing). For Proposed Projects not specifically addressing a health disparity or inequity, please provide information about specific actions the Applicant is and will take to ensure equal access to the health benefits created by the Proposed Project and how these actions will promote health equity.

To ensure health equity to all populations, including those deemed underserved, the Proposed Project will not affect accessibility of MGH's services for poor, medically indigent, and/or Medicaid eligible individuals. MGH does not discriminate based on ability to pay or payer source and this practice will continue following implementation of the Proposed Project. As further detailed throughout this narrative, the Proposed Project will increase access to high quality endoscopy, services for all patients in a number of ways.

Over the past decade, MGH has launched a variety of diversity initiatives to address healthcare disparities, increase the percentage of employees from underrepresented groups, build trust among people of diverse backgrounds and evaluate the hospital's progress. Given these efforts, MGH was recently named one of the nation's top ten hospitals and health systems on diversity issues by Diversity Inc., a publication that monitors best practices in the field. With these goals and MGH's commitment to increasing the number of employees from underrepresented groups, the hospital's staff represent various races and ethnicities. Through the Proposed Project, patients will have access to culturally competent staffing through a clinical staff representative of various races and ethnicities. Recently, the GI Division hired a new faculty member who is bilingual in English and Spanish to spearhead efforts in community outreach. The Hospital is committed to recruiting and hiring additional diverse staff that reflect the Hospital's patient panel.

Moreover, Partners HealthCare, and specifically MGH, has also adopted the Culturally and Linguistically Appropriate Service ("CLAS") standards set forth by the U.S. Department of Health and Human Services Office of Minority Health for all practice sites. MGH provides effective, understandable, and respectful care with an understanding of patients' cultural health beliefs and practices and preferred languages. Additionally, MGH has arrangements to offer ongoing education and training in culturally and linguistically appropriate areas for staff at all levels and across all disciplines.

In regard to interpreter services, MGH provides staff interpreters that speak eleven languages, including American Sign Language ("ASL"). Interpretations for encounters that occur at MGH's main campus staff are documented in a centralized Interpreter Services Tracking System, which contains a reporting tool for year-end statistics of positive encounters. MGH staff review the annual statistics and seek ways to improve these services.

Finally, all Partners HealthCare hospitals, including MGH participate in the American Hospital Association's #123Equity Pledge Campaign. This Campaign seeks to eliminate health and health care disparities that exist for racially, ethnically and culturally diverse individuals. The campaign requires hospital leaders to accelerate progress in the following areas: (1) Increasing the collection and use of race, ethnicity, language preference and other socio-demographic data; (2) Increasing cultural competency training; and (3) Increasing diversity in leadership and governance. Currently, all Partners HealthCare hospitals participate in the Campaign. This Campaign will allow MGH staff to ensure equal access to the benefits created by the Proposed Project.

F1.b.iv **Provide additional information to demonstrate that the Proposed Project will result in improved health outcomes and quality of life of the Applicant's existing Patient Panel, while providing reasonable assurances of health equity.**

The Proposed Project seeks to ensure timely access to endoscopy services. By providing patients with access to these services, patient wait times for procedures will be reduced. Timely treatment often ensures fewer complications, leading to reduced emergency department visits and hospitalizations and improved health outcomes. Moreover, expedited access to care may lead to a reduction in disease/condition-related complications, such as pain that directly impact a patient's quality of life.

F1.c **Provide evidence that the Proposed Project will operate efficiently and effectively by furthering and improving continuity and coordination of care for the Applicant's Patient Panel, including, how the Proposed Project will create or ensure appropriate linkages to patients' primary care services.**

To ensure continuity of care, improved health outcomes and enhanced quality of life, through the proposed Project, MGH's GI staff will continue existing formal processes for linking patients with their primary care physicians for follow-up care, as well as case management/social work support to ensure patients have access to resources around social determinant of health ("SDoH") issues. Providing patients with linkages to these necessary services prevents unnecessary readmissions, ensures appropriate care management and provides the patient with the resources for leading a better life. Moreover, patients at MGH will benefit from MGH's

mature PHM strategies, including an existing system of care coordination and care delivery alternatives aimed at improving patient experience and outcomes.

Partners has a number of integrated care programs in place to ensure continuity of care and care integration. In addition to programs, such as eConsult and Shared Decision-Making, MGH assists patients with linkages to care and SDoH through care managers who follow-up with patients after ambulatory procedures. These care manager's follow-up with patients telephonically to provide medication reconciliation and coordinate care with clinicians to optimize recovery. Moreover, and as discussed, MGH also offers a number of alternatives to emergency department care for patients through PMOU, a program that provides home-based urgent care for patients experiencing at-risk medical events believed to be treatable with enhanced home care. Accordingly, these efforts and initiatives ensure patients are appropriately linked to care integration resources.

F1.d **Provide evidence of consultation, both prior to and after the Filing Date, with all Government Agencies with relevant licensure, certification, or other regulatory oversight of the Applicant or the Proposed Project.**

Since a broad range of input is valuable in the planning of a project, the Applicant carried out a diverse consultative process with individuals at various regulatory agencies regarding the Proposed Projects. The following individuals are some of those consulted regarding this Project:

- Department of Public Health: Nora Mann, Director, Determination of Need Program; Rebecca Rodman, Deputy General Counsel; and Ben Wood, Director, Office of Community Health Planning and Engagement.
- MassHealth: Steven Sauter, Director, Acute Hospital Program, MassHealth Office of Providers and Plans and David Garbarino, Director of Purchasing Strategy and Analytics at Executive Office of Health and Human Services – MassHealth.

F1.e.i **Process for Determining Need/Evidence of Community Engagement:**
For assistance in responding to this portion of the Application, Applicant is encouraged to review *Community Engagement Standards for Community Health Planning Guideline.* With respect to the existing Patient Panel, please describe the process through which Applicant determined the need for the Proposed Project.

A. Community Engagement on the Expansion of Endoscopy Services

Based upon growing demand by MGH's patient panel for endoscopy services and given physical plant constraints within the Endoscopy Unit, MGH staff developed a plan to renovate and expand this clinical space. In contemplation of this expansion, MGH's leadership sought to define its community broadly and engage patients and family members that may be impacted by the Proposed Project to obtain feedback and answer questions. These engagement efforts are described below.

In an effort to ensure appropriate community engagement, the Proposed Project was presented at an Experience Design Workshop for the MGH – Cambridge Street Project Patient and Family Advisory Council ("PFAC"). The purpose of this meeting was to build a vision for the ideal MGH experience based on patient and family member feedback. At this workshop, participants were taken through a series of interactive activities, where they provided input on proposed projects,

such as the expansion and renovation of the Endoscopy Unit. An agenda and list of attendees for the meeting may be found in Attachment 4c. Overall feedback from the meeting was very positive and supportive of the plan. There were no concerns expressed by this group.

F1.e.ii **Please provide evidence of sound Community Engagement and consultation throughout the development of the Proposed Project. A successful Applicant will, at a minimum, describe the process whereby the "Public Health Value" of the Proposed Project was considered, and will describe the Community Engagement process as it occurred and is occurring currently in, at least, the following contexts: Identification of Patient Panel Need; Design/selection of DoN Project in response to "Patient Panel" need; and Linking the Proposed Project to "Public Health Value".**

To ensure sound community engagement throughout the development of the Proposed Project, the Applicant, in conjunction with MGH, took the following actions:

- Presented to the MGH – Cambridge Street Project PFAC on February 11, 2019 at an Experience Design Workshop.

For detailed information on these activities, see Attachment 4c.

For transparency and to educate the community regarding the public health value of the proposed endoscopy renovation and expansion, MGH presented on the Proposed Project at the aforementioned PFAC meeting. At this meeting, staff discussed the components of the Proposed Project and the patient panel need that the Project will meet, as well as the impact of the proposed Project including its public health value with PFAC members.

Factor 2: Health Priorities

Addresses the impact of the Proposed Project on health more broadly (that is, beyond the Patient Panel) requiring that the Applicant demonstrate that the Proposed Project will meaningfully contribute to the Commonwealth's goals for cost containment, improved public health outcomes, and delivery system transformation.

F2.a. **<u>Cost Containment:</u>**
Using objective data, please describe, for each new or expanded service, how the Proposed Project will meaningfully contribute to the Commonwealth's goals for cost containment.

The goals for cost containment in Massachusetts center around providing low-cost care alternatives without sacrificing high quality. In fact, the Commonwealth's independent state agency that develops policy to reduce health care cost growth and improve the quality of patient care, the Health Policy Commission, has a stated goal of bettering health and care at a lower cost across the Commonwealth. Consequently, the Proposed Project will meaningfully contribute to Massachusetts' goals for cost containment through the efforts outlined below. The expansion and renovation of the Hospital's Endoscopy Unit will allow more patients access to high quality endoscopy services. Studies comparing endoscopic procedures to open surgery have found that these minimally invasive procedures are two to five times less costly than open surgery. Furthermore, patients who have endoscopy tend to have fewer side effects and complications, as well as faster recovery times, leading to less health care utilization (through

reduced readmissions and emergency department visits) and therefore, reduced costs for providers, payers and patients. Moreover, when endoscopy is used as a screening or diagnostic tool, clinical conditions are identified in a timely manner, providing patients with more treatment interventions that tend to be lower cost. Accordingly, the Proposed Project will lower costs by providing timely access to cost-effective surgical alternatives. This Project also will provide earlier diagnoses for some patients, allowing for expedited treatment, thereby leading to a lower cost of care.

F2.b. **Public Health Outcomes:**
Describe, as relevant, for each new or expanded service, how the Proposed Project will improve public health outcomes.

The expansion of endoscopy services at MGH will improve public health outcomes as patients will have more timely and continued access to necessary services as demand continues to increase for the aging patient panel, ultimately leading to better quality outcomes and an enhanced patient care experience. Moreover, as discussed, studies have documented the benefits of obtaining timely endoscopy services, including more timely treatment of diseases and conditions that impact a patient's quality of life. When patients receive timely care, in the appropriate setting and achieve cost savings, both the health care market and patients benefit from these practices.

F2.c. **Delivery System Transformation:**
Because the integration of social services and community-based expertise is central to goal of delivery system transformation, discuss how the needs of their patient panel have been assessed and linkages to social services organizations have been created and how the social determinants of health have been incorporated into care planning.

As outlined in Section F.1.B.ii, MGH has numerous programs in place to ensure linkages to social service organizations, such as through the iCMP for high-risk, chronically ill patients. Additionally, as part of the transition to the MassHealth ACO model of care, the Applicant and MGH have implemented a universal screening program for SDoH. This includes screening for: housing, food insecurity, finances, childcare, transportation, and literacy. Staff have developed workflows to connect patients to internal and external resources if the patient screens positive in any of the SDoH domains.

Factor 5: Relative Merit

F5.a.i **Describe the process of analysis and the conclusion that the Proposed Project, on balance, is superior to alternative and substitute methods for meeting the existing Patient Panel needs as those have been identified by the Applicant pursuant to 105 CMR 100.210(A)(1). When conducting this evaluation and articulating the relative merit determination, Applicant shall take into account, at a minimum, the quality, efficiency, and capital and operating costs of the Proposed Project relative to potential alternatives or substitutes, including alternative evidence-based strategies and public health interventions.**

Proposal: Renovated and expand the Endoscopy Unit to address physical plant constraints and ensure access to endoscopy services for an aging patient panel.

Quality: The Proposed Project is a superior alternative for providing high quality endoscopy services and improving health outcomes for patients. The expansion of endoscopy services, will allow patients to receive timely diagnosis and treatment for GI diseases and conditions. When endoscopy is used as a diagnostic tool, various conditions are identified expeditiously, leading to timely treatment and improved quality outcomes. When endoscopy is performed rather than a corresponding open surgery, patients tend to have fewer complications and fast recovery times.

Efficiency: Currently, physical plant constraints cause operational inefficiencies. The Endoscopy Unit has very limited perioperative space, hampering throughput and causing delays, which frequently lead to overcrowding. Consequently, the discharge process is constrained, leading to longer lengths of stay and dissatisfaction by patients with their overall care experience. Through the Proposed Project, wait times for procedures will be reduced with the expansion of the clinical space. Moreover, the Proposed Project will address patient throughput issues by adding ten additional recovery beds, leading to reduced lengths of stay and more efficient discharge processes.

Capital Expense: The proposed renovation and expansion of endoscopy services represents a cost-effective project as MGH staff have worked with the architects and the design team to implement a cost-effective expansion.

Operating Costs: Maintaining the Endoscopy Unit in its current state will continue to present operation inefficiencies, including administrative costs associated with inefficient and ineffective patient throughput. The Proposed Project will eliminate these inefficiencies, leading to stabilized operating costs.

List alternative options for the Proposed Project:

Option 1

Alternative Proposal: Expansion of the Endoscopy Unit across the Gray and Jackson building to create a larger multi-specialty procedural space for cardiology, pulmonary, and endoscopy.

Alternative Quality: This is not a feasible solution as this alternative requires major construction that would disrupt other clinical services, impacting patient care and experience. Additionally, this alternative would require the relocation of the Anesthesia Department, which is not feasible.

Alternative Efficiency: Given the large amount of construction, this alternative would need to occur through a multi-phased strategy taking approximately six years. Moreover, consolidation of specialized services may not improve operating or cost efficiencies.

Alternative Capital Expenses: The capital expense for this alternative would have been much more expensive than the Proposed Project with projected costs at approximately $98M over six years, nearly three times the cost of the Proposed Project.

Alternative Operating Costs: Operating costs would be higher for this alternative given disruption to other clinical services, including the need to relocate the Anesthesia Department.

Option 2

Alternative Proposal: Expansion of the Endoscopy Unit to an off-campus location at the Charles River Plaza 9 Building.

Alternative Quality: Relocating the Endoscopy Unit from MGH's main campus to an off-campus setting is not feasible as this off-campus location is limited in regard to the types of patients that may be cared for in this outpatient setting. Patients with co-morbidities and higher levels of acuity, as well as inpatients would still need to receive services at MGH's main campus as these patients need access to resources only available on the main campus, such as anesthesia support and operating rooms. Furthermore, this alternative only allows for the expansion of endoscopy at the off-campus location by one procedure room. Since demand for these services will increase, this alternative does not allow MGH to meet the demand for endoscopy services of an aging patient panel.

Alternative Efficiency: With only specific types of patients able to receive services in an off-campus setting, MGH would need to create both an on-campus and off-campus program for patients with endoscopy needs. The creation of two programs would be inefficient and impact patient and provider experience.

Alternative Capital Expenses: Given that this alternative would not allow MGH to meet current and future demand for endoscopy services, this alternative was deemed not feasible and exact capital expenses were not calculated.

Alternative Operating Costs: Operating costs for this alternative would be higher than the Proposed Project as MGH would need to maintain operations for two Endoscopy Units both on- and off-campus.

Addition of PET/MR and MRI Capacity

Factor 1: Applicant Patient Panel Need, Public Health Values and Operational Objectives

F1.a.i **Patient Panel:**
Describe your existing Patient Panel, including incidence or prevalence of disease or behavioral risk factors, acuity mix, noted health disparities, geographic breakdown expressed in zip codes or other appropriate measure, demographics including age, gender and sexual identity, race, ethnicity, socioeconomic status and other priority populations relevant to the Applicant's existing patient panel and payer mix.

A. Partners HealthCare Patient Panel

Partners HealthCare is a not-for-profit, integrated health care system that was formed in 1994 by an affiliation between The Brigham Medical Center, Inc. (now known as Brigham Health) and The Massachusetts General Hospital. Partners HealthCare currently operates two tertiary hospitals, six community acute care hospitals, and one acute care specialty hospital in Massachusetts; one community acute care hospital in Southern New Hampshire; one facility providing inpatient and outpatient mental health services; and three facilities providing inpatient and outpatient services in rehabilitation medicine and long-term care. Partners HealthCare also operates physician organizations and practices, a home health agency, nursing homes and a graduate level program for health professionals. Partners HealthCare is a non-university-based nonprofit private medical research enterprise and its academic medical centers are principal teaching affiliates of the medical and dental schools of Harvard University. Partners HealthCare provides its services to patients primarily from the Greater Boston area and eastern Massachusetts, as well as New England and beyond. Additionally, Partners HealthCare operates a licensed, not-for-profit managed care organization that provides health insurance products to the MassHealth Program (Medicaid), Commonwealth Care (a series of health insurance plans for adults who meet income and other eligibility requirements) and commercial populations.

Partners HealthCare serves a large and diverse patient panel as demonstrated by the utilization data for the 36-month period covering Fiscal Year ("FY") 16-18 and the preliminary data available for FY19.[1] Attachment 2 provides this demographic profile for Partners HealthCare in table form. The number of patients utilizing Partners HealthCare's services has increased[2] since FY16, with 1,377,250 unique patients in FY16, 1,403,853 unique patients in FY17 and 1,500,670 unique patients in FY18.[3] Preliminary data indicate that for the first six week of FY19

[1] Fiscal year October 1 – September 30. While preliminary data is available for FY19, annual comparisons are calculated using data for FY16-18 as the FY19 data is only for the first six weeks of the new fiscal year and will change over time.

[2] The methodology for aggregating Partners HealthCare's patient panel data has evolved into an automated process utilizing internal data resources. Initially, in 2017, when Partners HealthCare began developing its patient panel for Determination of Need applications, such as the Change of Ownership for Massachusetts Eye and Ear and the Substantial Capital Expansion for Brigham and Women's Hospital, staff manually aggregated the necessary data. However, since these submissions, Partners HealthCare staff have developed a new automated process that allows for the collection and amalgamation of system-wide data. This refined methodology allows staff to continuously monitor and improve the way that data are aggregated. Accordingly, between June 2018 and October 2018, staff further refined the data collection processes leading to a decrease of no more than 5% in overall patient counts for the system. Staff will continue to refresh and refine the process for aggregating data across the system, leading to more exact patient panel data.

[3] Entities include: Brigham and Women's Hospital, Brigham and Women's Faulkner Hospital, Massachusetts General Hospital, Newton-Wellesley Hospital, and North Shore Medical Center; Cooley Dickinson Hospital, Martha's Vineyard Hospital, McLean Hospital, and Nantucket Cottage Hospital (post-Epic data only); Massachusetts Eye and Ear Infirmary (outpatient post-Epic data only); Spaulding Rehabilitation Hospital (Telehealth, Partners Mobile Observation

Partners HealthCare had 398,563 unique patients. Partners HealthCare's patient mix consists of approximately 42% males and 58% females. The Massachusetts Center for Health Information and Analysis ("CHIA") reports that Partners HealthCare's patient panel represents 19% of all discharges in the Commonwealth.[4] The system's case mix adjusted discharge rate is 22%.[5]

Partners HealthCare has seen an increase in the number of patients it serves across all age cohorts between FY16 and FY18. Current age demographics show that the majority of the patients within Partners HealthCare's patient population are between the ages of 18-64 years of age (61.7-62.1% of the total patient population). Patients that are 65 and older also make up a significant portion of the total patient population (26.1-27.8% of the total patient population). Only 10.4-11.9% of Partners HealthCare's patients are between 0-17 years of age. Preliminary data for FY19 shows similar trends with regard to increases across age cohorts and cohort distribution.

Partners HealthCare's patient panel reflects a mix of races. Data based on patient self-reporting demonstrate that in FY18, 72.0% of the total patient population identified as White; 5.5% identified as African American or Black; 4.1% identified as Asian; 1.5% identified as Hispanic/Latino; 0.1% identified as American Indian or Alaska Native; and 0.1% identified as Native Hawaiian or Other Pacific Islander. Since patients were grouped into these categories based on how they self-identified,[6] there is a portion of the patient population (16.8% in FY18) that either chose not to report their race or identified as a race that did not align with the aforementioned categories. Therefore, it is important to note that the racial composition of Partners HealthCare's patient panel may be understated.

Partners HealthCare provides care to patients from a broad range of geographies including all fifty states. While Partners HealthCare's patient panel resides mainly in Eastern Massachusetts, there is a sizeable portion of the patient panel that resides outside of Massachusetts (10.3%, or 155,302 patients, in FY18). By applying the Department of Public Health's ("DPH") Health Service Area ("HSA") categories to FY18 data, 43.6% of Partners HealthCare's patients reside in HSA 4 (654,363 patients); 16.3% reside in HSA 6 (244,578 patients); 13.6% reside in HSA 5 (204,213 patients); 6.4% reside in HSA 3 (95,780 patients); 3.3% reside in HSA 2 (49,077 patients); 6.1% reside in HSA 1 (90,977 patients); 0.01% reside in MA but outside of HSAs 1-6 (45 patients); and the origin of 6,335 patients or 0.5% of the panel is unknown.

Unit, Home Hospital programs for GH and BWH, Stay Connected with GH, Lifeline, and CareSage programs are not included); Brigham and Women's Physicians Organization, Massachusetts General Physicians Organization, Newton-Wellesley Medical Group, and North Shore Physicians Group; Cooley Dickinson PHO (post-Epic data only); and Partners Community Physicians Organization (pre-Epic non-risk patients not included).

[4] *Fiscal Year 2015: Partners HealthCare System*, MASSACHUSETTS CTR. FOR HEALTH INFORMATION ANALYSIS, http://www.chiamass.gov/assets/docs/r/hospital-profiles/2015/Partners-HealthCare-System.pdf (last visited Mar. 29, 2019).

[5] *Id.*

[6] With the exception of the category "Hispanic/Latino," the race categories shown above are based on the 1997 Office of Management and Budget standards on race and ethnicity. Patients were grouped into these categories based on their responses as follows – White: "White"; African American or Black: "African American", "Black", "Black or African American"; American Indian or Alaska Native: "American Indian", "American Indian or Alaska Native"; Asian: "Asian"; Native Hawaiian or Other Pacific Islander: "Native Hawaiian or Other Pacific Islander", "Native Hawaiian/Other Pacific Islander", "Pacific Islander"; Hispanic/Latino: "Hispanic"," Hispanic or Latino"," Latino"; Other/Unknown: All other responses.

B. Massachusetts General Hospital Patient Panel

Massachusetts General Hospital ("MGH") is one of the founding members of Partners HealthCare and the original teaching hospital of Harvard Medical School. With 1,035 licensed beds at its main campus in Boston, MGH is the largest hospital in the state. In addition to its main hospital campus in Boston, MGH offers services to patients through various hospital satellite and clinic locations across Eastern Massachusetts.

Overall Patient Panel

Attachment 2 provides the demographic profile for MGH in table form. Similar to Partners HealthCare, the number of patients utilizing MGH increased from FY16-FY18 and in FY19-year-to-date ("YTD"), with 563,470 unique patients in FY16, 563,976 unique patients in FY17, and 566,357 unique patients in FY18. In the first six week of FY19, MGH had 149,595 unique patients. Of these patients, approximately 44% are male and 56% are female.

In regard to age, the majority of MGH's patients are between the ages of 18-64 (59.3%, or 335,741 patients in FY18). The next largest age cohort is patients that are 65 years and older (26.4%, or 149,588 patients, in FY18). Subsequently, 14.3% of MGH's patients are between ages 0-17 (81,023 patients in FY18).

Moreover, MGH's patients reflect a diversity of races. Data based on patient self-reporting demonstrate that in FY18, 73.0% of patients identified as White; 5.2% identified as African American or Black; 5.2 identified as Asian; 0.8% identified as Hispanic/Latino; 0.1% identified as American Indian or Alaska Native; and 0.1% identified as Native Hawaiian or Other Pacific Islander. Since patients were grouped into these categories based on how they self-identified,[7] there is a portion of the patient population (15.7% in FY18) that either chose to not report their race or identified as a race that did not align with the above categories. Therefore, it is important to note that the racial composition of MGH's patients may be understated.

Finally, aggregated zip code data by HSA for FY18 demonstrate that MGH's patient population has a similar geographic composition to the larger Partners HealthCare patient panel. These data indicate that 49.2% of MGH's patients resided in HSA 4 (278,900 patients); 17.3% resided in HSA 6 98,075 patients); 8.6% resided in HSA 5 (48,576 patients); 5.8% resided in HSA 3 (32,725 patients); 3.2% resided in HSA 2 (18,211 patients); 1.3% resided in HSA 1 (7,174 patients). Over 79,819 patients or 14.1% of the panel was from outside of Massachusetts, and the origin of 0.5% of the panel was unknown.

PET/MR Patient Panel

The MGH Department of Radiology provides comprehensive diagnostic imaging and interventional services, trains the next generation of subspecialty radiologists, and carries out research that advances the state of the art in medical imaging. MGH's Department of Radiology employs more than 100 board-certified radiologists specializing in twelve clinical areas

[7] With the exception of the category "Hispanic/Latino", the race categories shown above are based on the 1997 Office of Management and Budget standards on race and ethnicity. Patients were grouped into these categories based on their responses as follows – White: "White"; African American or Black: "African American", "Black", "Black or African American"; American Indian or Alaska Native: "American Indian", "American Indian or Alaska Native"; Asian: "Asian"; Native Hawaiian or Other Pacific Islander: "Native Hawaiian or Other Pacific Islander", "Native Hawaiian/Other Pacific Islander", "Pacific Islander"; Hispanic/Latino: "Hispanic"," Hispanic or Latino"," Latino"; Other/Unknown: All other responses.

supported by hundreds of highly trained technologists and support staff. Over 500 researchers are pioneering advances in medical imaging, and close to 100 trainees are studying to become the next generation of subspecialized radiologists. MGH's radiologists provide expert insight on using medical imaging to answer clinical questions and guide critical decisions.

To ensure patients have access to necessary imaging capabilities, through the Proposed Project, MGH plans to add one PET/MR unit that will be utilized for part-time clinical use with the remainder of its time dedicated to research. The high incidence of patients within the Commonwealth and the Applicant's patient panel with oncologic, cardiovascular, pediatric, neurologic, muskulo-skeletal and gastrointestinal conditions, the addition of this new modality will benefit individuals with these conditions. As this is the first PET/MR unit on the MGH campus, there is no historical volume data available. However, the benefits of PET/MR have been noted in numerous studies and are documented below and throughout this narrative.

MRI Patient Panel

Only a small population of patients will be eligible for PET/MR clinical scans. To maximize the utility of this resource, MGH also plans to utilize the MRI component of the PET/MR for part-time clinical use. Currently, MGH has ten MRI scanners, five of which are 1.5T strength and five MRIs that are 3.0T. In FY15 these ten MRI scanners performed 37,804 scans and in FY16 this scan volume had a slight decrease to 37,106 scans. However, in FY17, scan volume at MGH increased by nearly 5% to 39,577 scans. Currently, wait times for outpatient scans at MGH are up to 18 days for non-preferred time slots and up to 6 weeks for preferred time slots. This backlog coupled with a 1% growth trend for MRI services will severely constrain access to these services at MGH. Consequently, to ensure patients have timely access to MR services, through the Proposed Project, MGH will add additional part-time clinical MRI slots at its main campus by utilizing the MRI component of the PET/MR for twelve hours during the week and sixteen hours each weekend day. This increase in scanner availability will allow for an additional 1,500 scans annually, easing the backlog that currently exists at MGH's main campus.

F1.a.ii **Need by Patient Panel:**

Provide supporting data to demonstrate the need for the Proposed Project. Such data should demonstrate the disease burden, behavioral risk factors, acuity mix, health disparities, or other objective Patient Panel measures as noted in your response to Question F1.a.i that demonstrates the need that the Proposed Project is attempting to address. If an inequity or disparity is not identified as relating to the Proposed Project, provide information justifying the need. In your description of Need, consider the principles underlying Public Health Value (see instructions) and ensure that Need is addressed in that context as well.

A. Need for PET/MR Technology for Part-Time Clinical Use

As the population in the 65+ age cohort continues to rapidly grow within the Commonwealth (by 2035, the 65+ age cohort will represent approximately a quarter of the Massachusetts population[8]), so too, will the incidence of certain conditions, such as oncologic and cardiovascular conditions. Additionally, PET/MR may be used to diagnose pediatric, and

[8] LONG-TERM POPULATION PROJECTIONS FOR MASSACHUSETTS REGIONS AND MUNICIPALITIES, UNIVERSITY OF MASSACHUSETTS DONAHUE INSTITUTE 11, 14 (Mar. 2015), *available at* http://pep.donahue-institute.org/downloads/2015/new/UMDI_LongTermPopulationProjectionsReport_2015%2004%20_29.pdf.

neurologic conditions. PET/MR has proven to be an important tool in obtaining the necessary data to diagnose, stage and treat specific conditions within these sub-specialties. Consequently, MGH is seeking to add a PET/MRI unit for part-time clinical use. The addition of this modality will allow appropriate patients access to this necessary imaging technology.

Some of the benefits of PET/MR include, "Combined PET/MR scanners acquire PET and MR data simultaneously, allowing for accurate temporal and spatial matching of PET and MR data. MR has better soft-tissue contrast than CT and can acquire functional data with, for example, diffusion-weighted imaging ("DWI"). In a study that compared PET/CT and PET/MR, PET/CT was found to be superior in detecting lung nodules, but PET/MR revealed additional findings not seen on PET/CT in 41% of oncology patients. The radiation dose from PET/MR is substantially less than PET/CT. PET/MR appears to be particularly helpful in evaluating lesions in lymph nodes, liver, bone, pelvic organs, and breast tissue."[9] For these reasons, the Applicant's and MGH's patient panel will benefit from the addition of this unit.

Increased Incidence of Cancer Leads to a Greater Need for PET/MR Imaging Services

Cancer is the leading cause of death in the Commonwealth, with an age-adjusted death rate of 155.5 per 100,000 persons in 2014.[10] Preliminary cancer incidence rates reported by the Massachusetts Department of Public Health – Massachusetts Cancer Registry from September 2017 provide an age-adjusted overall cancer incidence rate of 459.4 per 100,000 persons (with a 95% confidence limit of 457.2-461.5 per 100,000 persons) for 2011-2015, which is greater than the national incidence rate. The most commonly diagnosed types of cancer in Massachusetts for men during 2011-2015 were prostate cancer, followed by cancers of the bronchus and lung, colon/rectum, and urinary bladder.[11] [12] Among women in Massachusetts, the most commonly diagnosed cancer types were cancers of the breast, bronchus and lung, colon/rectum, and thyroid.[13] From 2009-2013, there were 64,543 deaths from cancer among Massachusetts residents, for an average annual age-adjusted mortality rate of 162.9 deaths per 100,000 persons.[14] From 2010-2014, the number of deaths slightly decreased to 63,671 deaths, with an average of 12,734 deaths annually.[15] Similar to newly diagnosed cases, cancer mortality in Massachusetts decreased from 2009 to 2013 and again from 2010 to 2014.[16] These decreases in overall cancer rates are evidence that treatment services, along with new technology and scientific discoveries are leading to improved outcomes in the Commonwealth. However, cancer remains pervasive, leading to more deaths in Massachusetts than any other disease.[17] Accordingly, through the Proposed Project, MGH will provide access to PET/MR services (with this being the only PET/MR within Massachusetts), which will allow for better staging and enhanced ability to appropriately diagnosis and treat patients with specific oncologic conditions.

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[9] Janet Cochrane Miller, *Combined PET/MR Imaging,* 14 RADIOLOGY ROUNDS 11 (Nov./Dec. 2016), https://www.massgeneral.org/imaging/news/radiology-rounds/nov-dec-2016/combined-pet-mr-imaging/.
[10] *Stats of the State of Massachusetts,* CTRS. FOR DISEASE CONTROL AND PREVENTION, https://www.cdc.gov/nchs/pressroom/states/massachusetts.htm (last reviewed July 7, 2016).
[11] *Id.*
[12] *Cancer Incidence and Mortality in Massachusetts 2011 – 2015: Statewide Report,* MASS. DEP'T. OF PUBLIC HEALTH, https://www.mass.gov/lists/cancer-incidence-statewide-reports (July 2018).
[13] *Id.*
[14] *Id.*
[15] *Id.*
[16] *Id.*
[17] *Stats of the State of Massachusetts, supra* note 10.

Several studies show that PET/MR has superior diagnostic potential for the overall detection of malignancies in cancer patients.[18] PET/MR has proven particularly useful in evaluating lesions and providing better information and characterization in prostate cancer, pediatric oncology, breast cancer, and gynecologic malignancies.[19] Oncologic imaging research demonstrates the clinical advantages of using PET/MR over PET/CT at several clinical stages, including: the identification and evaluation of lesions in the brain, breast, liver, kidney, and bones; improved lesion margins in non-pulmonary soft tissue and bone; better overall lesion alignment; quantitative accuracy by MRI-based motion correction without additional radiation; reduced overall radiation exposure; and expanded parametric quantitative imaging.[20] PET/MR has also shown better accuracy in local staging of the pelvis and better evaluation of tumors in regions difficult to assess, such as the kidneys.[21] Accordingly, access to PET/MR imaging services for patients with specific oncologic conditions is vital to enhanced diagnosis and appropriate treatment.

Cardiac Conditions and the Need for PET/MR Services

According to the 2015 Massachusetts Behavioral Risk Factor Surveillance System, statewide, 5.7% of Massachusetts adults are diagnosed with myocardial infarction and 5.3% are diagnosed with angina or coronary heart disease annually. These percentages are similar to figures from previous years, representing a consistent incidence rate trend: in 2013, 5.2% of Massachusetts adults were diagnosed with myocardial infarction, and 4.7% were diagnosed with angina or coronary heart disease; and in 2014, 5.6% of Massachusetts adults were diagnosed with myocardial infarction, and 5.8% were diagnosed with angina or coronary heart disease. Moreover, according to the American Heart Association, 12,023 people died of coronary artery disease in Massachusetts in 2013, making heart disease, the second leading cause of death.

PET imaging is the most frequently used modality for diagnosing obstructive coronary artery disease; its high sensitivity and specificity yields accurate prognosis and good patient management.[22] The addition of MRI imaging after an injection of a fast bolus of gadolinium contrast agent yields even increased sensitivity in the diagnosis of obstructive coronary artery disease.[23] MRI is the gold standard in assessing cardiac structure, left ventricular function, and wall motion; tissue perfusion and glucose metabolism provided by PET improves the opportunity for identifying underlying cardiac disease.[24] Cardiac PET/MR imaging that uses specific tracers to explore various designated areas of the heart might also provide valuable pathophysiologic data.[25] Consequently, given that coronary artery disease is the second leading cause of death in

[18] Guohua Shen et al., *Diagnostic Performance of Whole-Body PET/MRI for Detecting Malignancies in Cancer Patients: A Meta-Analysis,* 11 PLOS ONE 4 (Apr. 28, 2016); Onofrio A. Catalano et al, *Clinical Impact of PET/MR Imaging in Patients with Cancer Undergoing Same-Day PET/CT: Initial Experience in 134 Patients – A hypothesis-generating Exploratory Study,* 269 RADIOLOGY 3, 857 (Dec. 2013).
[19] Miller, *supra* note 9; D.L. Bailey et al., *Combined PET/MRI:* Global Warming – *Summary Report of the 6th International Workshop on PET/MRI, March 27-29, 2017, Tübingen, Germany,* 20 MOL. IMAGING BIOL. 4, 10 (Oct. 2017).
[20] Miller, *supra* note 9; Andrew B. Rosenkrantz et al., *Current Status of Hybrid PET/MRI in Oncologic Imaging,* 206 AM. J. ROENTGENOL. 1 (Jan. 2016).
[21] Catalano, *supra* note 18 at 864.
[22] Christoph Rischpler et al., *Hybrid PET/MR Imaging of the Heart: Potential. Initial Experiences, and Future Prospects,* 54(3) J. NUCL. MED. 402, 407 (Mar. 2013).
[23] *Id.*
[24] *Id.* at 408-9.
[25] Felix Nensa et al., *Hybrid PET/MR Imaging of the Heart: Feasibility and Initial Results,* 268(2) RADIOLOGY 366 (Aug. 2013).

the Commonwealth, enhanced access to PET/MR imaging may assist clinicians in diagnosing and treating patients in a more timely fashion, reducing complications from the disease.

Evolving Technology and the Benefits of PET/MR

Multimodality imaging has made great strides in imaging evaluation of patients with a variety of diseases, including oncologic, cardiovascular, pediatric, and neurologic conditions. "While the initial development of combined PET/MR was in the preclinical arena, hybrid PET/MR scanners are now available for clinical use. PET/MR combines the unique features of MRI including excellent soft tissue contrast, diffusion-weighted imaging, dynamic contrast-enhanced imaging, fMRI and other specialized sequences, as well as MR spectroscopy with the quantitative physiologic information that is provided by PET. Most evidence for the potential clinical utility of PET/MR is based on studies performed with side-by-side comparison or software-fused MRI and PET images. Data on distinctive utility of hybrid PET/MR are rapidly emerging. In general, PET/MR may be preferred over PET/CT where the unique features of MRI provide more robust imaging evaluation in certain clinical settings."[26] Accordingly, the benefits of this multimodality imaging are vast, especially for specific sub-sets of patients.

Through the Proposed Project, MGH plans to offer access to the benefits of this multimodality imaging technology to its patients. Based on forecasted volume for the PET/MR, MGH has developed Table 1 outlining the number of clinical PET/MR scans that will be performed annually.

Table 1: Projected PET/MR Scans

	Year 1	Year 2	Year 3	Year 4	Year 5
Annual PET/MR clinical scans	356	416	462	462	462
Annual PET/MR research scans	462	546	596	596	596
Total	**818**	**962**	**1,058**	**1,058**	**1,058**

B. Need for Additional MR Capacity

Growing Demand for Imaging Technology

The use of advanced diagnostic imaging in the United States, including imaging with MRI has increased significantly over the last two decades.[27] Several factors have contributed to this increase, including advancements in technology (e.g., improvements in techniques, resolution,

[26] Hossein Jadvar et al, *Competitive Advantage of PET/MRI,* 81 EUR. J. RADIOL. 1, 84-94 (Jan. 2014).

[27] Rebecca Smith-Bindman et al., *Rising Use Of Diagnostic Medical Imaging In A Large Integrated Health System*, 27 HEALTH AFFAIRS 1491 (2008), *available at* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2765780/pdf/nihms-137739.pdf; Rebecca Smith-Bindman et al., *Use of Diagnostic Imaging Studies and Associated Radiation Exposure For Patients Enrolled in Large Integrated Healthcare Systems, 1996–2010*, 307 JAMA 2400 (2012), *available at* https://jamanetwork.com/journals/jama/fullarticle/1182858; Robert J. McDonald et al., *The Effects of Changes in Utilization and Technological Advancements of Cross-Sectional Imaging on Radiologist Workload*, 22 ACADEMIC RADIOLOGY 1191 (2015); Michael Walter, *Feeling overworked? Rise in CT, MRI images adds to radiologist workload*, RADIOLOGY BUSINESS (Jul. 31, 2015), http://www.radiologybusiness.com/topics/quality/feeling-overworked-rise-ct-mri-images-adds-radiologist-workload; *Increases in Imaging Procedures, Chronic Diseases Spur Growth of Medical Imaging Informatics Market*, IMAGING TECHNOLOGY NEWS (Oct. 28, 2016), https://www.itnonline.com/content/increases-imaging-procedures-chronic-diseases-spur-growth-medical-imaging-informatics-market.

and acquisition time), expansion of clinical applications (particularly to diagnose and treat age-related conditions), and patient- and physician-generated demand.[28] These advancements are widely credited with leading to improved patient outcomes – through earlier and more accurate diagnoses of disease using noninvasive techniques – as well as improved patient care processes.[29]

MGH has experienced demand consistent with this upward trend. As set forth in Factor F.1.a.i, across MGH, the number of patients receiving MRI services has increased over the last two fiscal years. From FY16 to FY17, the number of MRI scans performed at MGH increased by 5.0% (from 37,106 patients in FY16 to 39,577 patients in FY17). Moreover, this trend appears to have remained consistent with 42,669 scans in FY18. Although MGH consistently provides continuous access to MRI services (with two hours of quality control and cleaning time built into each scanner's schedule per week), there are backlogs and longer wait times. Currently the wait time to obtain an outpatient MRI scan at MGH is 18 days for a non-preferred time slot. For preferred time slots, the wait time for a scan is up to 6 weeks. For inpatients and emergency department patients, the wait is generally six hours, which exceeds the hospital's benchmark of 2 hours.

With the current backlog of MR scans at MGH's main campus, as well as the forecasted future demand for MR services by an aging patient population, the hospital needs increased MR capacity at its main campus. Through the implementation of the PET/MR, the hospital will utilize the MR component of this technology, three evenings per week and on both weekend days to meet the demand for MRI services. Projected scans for the MRI component of the PET/MR is outlined in Table 2.

Table 2: Projected MRI Scans on the PET/MR Unit

	Year 1	Year 2	Year 3	Year 4	Year 5
Annual MRI exams	1,167	1,373	1,510	1,510	1,510
Total	**1,167**	**1,373**	**1,510**	**1,510**	**1,510**

The addition of this MRI capacity at MGH's main campus will allow the hospital to address the backlog of needed scans, reduce wait times for an MRI scan and improve access to necessary imaging services. Additionally, this capacity will assist in meeting the current and future needs of its patient panel for MRI services.

[28] *Rising Use Of Diagnostic Medical Imaging In A Large Integrated Health System*, *supra* note 27; *Use of Diagnostic Imaging Studies and Associated Radiation Exposure For Patients Enrolled in Large Integrated Healthcare Systems, 1996–2010*, *supra* note 27; McDonald, *supra* note 27; Walter, *supra* note 27; *Increases in Imaging Procedures, Chronic Diseases Spur Growth of Medical Imaging Informatics Market*, *supra* note 27.

[29] *Rising Use Of Diagnostic Medical Imaging In A Large Integrated Health System*, *supra* note 27; *Use of Diagnostic Imaging Studies and Associated Radiation Exposure For Patients Enrolled in Large Integrated Healthcare Systems, 1996–2010*, *supra* note 27; McDonald, *supra* note 27; Walter, *supra* note 27; *Increases in Imaging Procedures, Chronic Diseases Spur Growth of Medical Imaging Informatics Market*, *supra* note 27.

F1.a.iii **Competition:**

Provide evidence that the Proposed Project will compete on the basis of price, total medical expenses, provider costs, and other recognized measures of health care spending. When responding to this question, please consider Factor 4, Financial Feasibility and Reasonableness of Costs.

The Proposed Project will not have an adverse effect on competition in the Massachusetts healthcare market based on price, TME, provider costs or other recognized measures of health care spending for numerous reasons. Evidence-based studies have found that PET/MR is a superior method for detecting and staging specific forms of cancer as this modality frequently reveals additional findings for patients not seen on a PET/CT.[30] PET/MR is cost-effective tool for treating various conditions and diseases as frequently this modality offers an original contribution to the management of a patient, including additional data that may be amalgamated with a patient's diagnosis to allow for more accurate prognosis and enhanced therapeutic planning.[31] Enhanced accuracy in diagnosis and treatment planning allows doctors to forego unnecessary testing and procedures, leading to less healthcare spending.

Additionally, the radiation exposure from a PET/MR is substantially less than exposure from a PET/CT.[32] The Journal of Nuclear Medicine stipulates, "The absence of ionizing radiation may significantly increase the cost effectiveness of PET/MR imaging for non-oncologic indications, such as inflammatory diseases. The lower radiation dose associated with PET/MR imaging represents an advantage for patients with chronic diseases who must undergo periodic imaging to evaluate disease activity. PET/MR imaging might therefore be in higher demand for such subjects as those with Crohn's disease, rheumatoid arthritis, granulomatosis, or fever of unknown origin. Similarly, the lower radiation dose could support the use of PET/MR imaging in oncologic patients undergoing multiple scans, particularly when such patients are young, as in the case of subjects being monitored for therapy response or with a high risk of relapse."[33] Reduced exposure to radiation leads to fewer complications from irradiation, thereby reducing other healthcare services that are prompted to treat exposure, such as hospitalization for toxicity, etc. This overall reduction in utilization reduces costs, ultimately leading to decreased TME.

Moreover, the addition of a part-time MRI for clinical use will not negatively impact competition as the Proposed Project will add a minimal number of new scans annually to the overall market to meet existing demand as evidenced by wait times. Furthermore, by decreasing the backlog of scans that currently exists at MGH's main campus and satellites, the hospital will allow expedited access to services, which in turn, leads to more timely diagnosis and treatment. As stated, access to expedited services generally leads to higher quality outcomes and reduced cost for the patient and provider. Accordingly, the Proposed Project will have no negative impact on competition within the Massachusetts healthcare market.

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[30] Miller, *supra* note 9.

[31] Luigi Mansi et al, *Perspectives on PET/MR Imaging: Are We Ready for Clinical Use?* 55 J. NUCLEAR MEDICINE 4, 529-30 (Apr. 1, 2014), *available at* http://jnm.snmjournals.org/content/55/4/529.

[32] *Id.*

[33] *Id.*

F1.b.i **Public Health Value /Evidence-Based:**
Provide information on the evidence-base for the Proposed Project. That is, how does the Proposed Project address the Need that Applicant has identified.

A. MGH's Proposed Addition of a PET/MR for Part-Time Clinical Use

PET and MRI are two well-established imaging modalities that have been available for clinical use for over three decades.[34] PET/MR is a recently developed combination imaging technique that merges the quantitative physiologic and metabolic information provided by stand-alone PET with the complementary anatomic and functional information provided by stand-alone MRI.[35] PET/MR is preferred over PET/CT in certain clinical settings as the unique features of the MRI allow for more comprehensive imaging evaluation.[36] MRI provides anatomical information with improved soft-tissue contrast and can visualize specific tissues and pathology using imaging sequences that are not available with CT.[37] PET/MR units acquire data simultaneously, slice by slice, providing excellent image registration and improved fine anatomic detail.[38] Additionally, the radiation dose from PET/MR is significantly lower than from PET/CT, making PET/MR a preferred imaging modality, especially among those patients in need of continued scans, as well as children.[39]

Since approved for use in Europe and the US in 2011, PET/MR has been particularly helpful in oncologic, cardiovascular, pediatric, and neurologic imaging.[40] PET/MR is particularly well-suited in precision medicine for several reasons: the ability to concurrently obtain a broad range of quantitative images, the simultaneous image acquisition of two unique modalities, and the acquisition of combined modalities without increased radiation.[41] Moreover, PET/MR frequently allows for enhanced accuracy around diagnosis and treatment planning given additional data that is provided by these scans.

Oncology

PET/MR offers advantages over PET/CT in evaluating various forms of cancer, including bone lesions, as signal alteration on MR may provide an anatomic correlate of increased PET tracer uptake.[42] This becomes useful in detecting bone metastases in patients with breast cancer and multiple myeloma.[43] PET/MR's higher soft-tissue contrast has proven more sensitive than CTs for early detection of bone marrow pathologies, and therefore presents an advantage in detecting and delineating bone metastases and primary bone tumors.[44] Early detection of bone metastases is crucial in patient management, disease outcome, and quality of life.[45] Primary

[34] Felix Nensa et al., *Clinical Applications of PET/MRI: Current Status and Future Perspectives,* 20 DIAGN. INTERV. RADIOL. 438–447 (2014).
[35] Nensa, *supra*; Jadvar, *supra* note 26.
[36] Jadvar, *supra* note 26.
[37] Jadvar, *supra* note 26.
[38] Miller, *supra* note 9.
[39] Miller, *supra* note 9.
[40] Miller, *supra* note 9; Nensa, *supra* note 25.
[41] Kenneth A. Miles et al., *Additional Clinical Value for PET/MRI in Oncology: Moving Beyond Simple Diagnosis,* 59 J. NUCL. MED. 7, 1028 (Mar. 2018).
[42] Miller, *supra* note 9.
[43] Miller, *supra* note 9.
[44] Matthias Eiber et al., *Performance of Whole-Body Integrated ^{18}F-FDG PET/MR in Comparison to PET/CT for Evaluation of Malignant Bone Lesions,* 55 J. NUCL. MED. 191 (2014).
[45] *Id.*

tumors in the head and neck are also more easily observable in PET/MR than in PET/CT; the use of an iodine-124 tracer can better detect iodine-positive metastatic lesions from thyroid cancer than can PET/CT.[46]

In whole body staging of recurrent breast cancer, a study has demonstrated that while PET/MI and PET/CT both correctly identify patients with breast cancer recurrence, PET/MR was able to detect all lesions, whereas PET/CT identified only 97% of lesions.[47] PET/MR also correctly categorized lesions at a higher proportion than PET/CT (98.5% versus 94.8%).[48] Other research confirms that PET/MR is better able to define the correct T-stage in significantly more breast cancer cases than PET/CT, which may allow clinicians to better determine the extent of the local tumor.[49] Such improved accuracy and specificity in diagnostic imaging is important in identifying and monitoring tumor growth. Breast cancer researchers now consider the use of simultaneous PET/MR in their research more beneficial than separate PET/CT and MRI scans based on patient comfort associated with reduced time, physiological equivalence associated with a single anatomical position, better detection of cancerous cells, and decreased radiation exposure.[50] The benefits of simultaneous PET/MR extend to patient care directly in the improved identification and evaluation of breast cancer lesions and indirectly through the translation of improved research methodologies to patient care.

Cardiology

The combination of PET/MR imaging also is helpful in diagnosing cardiovascular disease ("CVD"), the successful treatment of which is often determined by early detection.[51] CVD is among the leading cause of death in the world, and early detection through PET/MR imaging allows physicians to more accurately predict the risk of complications, guide therapeutic interventions, and monitor the success of treatment.[52] When PET and MR technologies are combined, together they provide a total assessment with increased sensitivity and accuracy.[53] PET/MR also presents a substantial advantage to the use of separate of sequential imaging; in one longer, combined procedure patients experience less disruption and may improve patient compliance in patients with conditions that prevent breath-holding.[54]

Pediatric Oncology

The primary advantage of PET/MR over PET/CT is the lower dose of radiation, especially in children.[55] PET/MR only requires one examination as opposed to multiple examinations,

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[46] Johannes Czernin et al., *Does PET/MR Imaging Improve Cancer Assessments? Literature Evidence from More Than 900 Patients,* 55 J. NUCL. MED. 6 (Suppl. 2) (June 2014); I. Binse et al., *Imaging with ^{124}I in differentiated thyroid carcinoma: is PET/MRI superior to PET/CT?,* 43 EUR. J. NUCL. MED. MOL. IMAGING 1011 (2016).

[47] Lino M. Sawicki et al., *Evaluation of ^{18}F-FDG PET/MRI, ^{18}F-FDG PET/CT, MRI, and CT in whole-body staging of recurrent breast cancer,* 85 EUR. J. RADIOL. 459-465, 459 (2016).

[48] *Id.*

[49] Johannes Grueneisen et al., *Positron Emission Tomography/Magnetic Resonance Imaging for Local Tumor Staging in Patients With Primary Breast Cancer: A Comparison With Positron Emission Tomography/Computed Tomography and Magnetic Resonance Imaging,* 50 INVEST RADIOL 505, 505 (2015).

[50] Nathaniel E. Margolis et al., *Assessment of Aggressiveness of Breast Cancer Using Simultaneous ^{18}F-FDG-PET and DCE-MRI,* 41 CLIN. NUCL. MED. e355–e361, e360 (2016).

[51] Myriam Amsallem et al., *Magnetic Resonance Imaging and Positron Emission Tomography Approaches to Imaging Vascular and Cardiac Inflammation,* 80 CIRC J 6, 1269 (May 25, 2016).

[52] *Id.*

[53] *Id.* at 1275.

[54] Rischpler, *supra* note 22 at 407.

[55] Franz Wolfgang Hirsch et al., *PET/MR in children. Initial clinical experience in paediatric oncology using an integrated PET/MR scanner,* 43 PEDIATRIC RADIOLOGY 860 (Jan. 11, 2013).

decreasing psychological stress for the child as well as the length of the diagnostic period prior to the start of treatment.[56] Whole-body MRI is the preferred imaging modality in numerous oncologic disorders in children as MRI technology provides high sensitivity for lesion detection and superior soft-tissue contrast for local staging.[57] Adding the PET component significantly increases diagnostic sensitivity and specificity by combining the high anatomic resolution and high sensitivity of MRI with the complementary metabolic information of PET.[58] Evidence to date suggests that PET/MR may replace PET/CT as the preferred modality for local tumor imaging given its superior ability to characterize soft-tissue lesions and bone marrow processes.[59]

Neurology

With regard to neurologic disease, PET/MR has significant potential in the fields of neurology, neurosurgery and neuro-psychiatry due to the merging of anatomic and metabolic imaging in one examination.[60] PET/MR can increase the understanding of the pathogenesis and mechanism of various conditions, including Alzheimer's disease, epilepsy and brain tumors.[61] Research indicates that emerging PET diagnostic tracers and MRI techniques could even broaden the capabilities of simultaneous PET/MR to successfully identify dementia, Parkinson's disease, and other neurodegenerative diseases.[62] PET/MR has the potential to become the preferred treatment modality in neurology by providing initial biomarker information, and facilitating improved early and differential diagnosis and drug regimen development and testing.[63]

B. MGH's Proposed Addition of MRI Capacity

MRI is well-established non-invasive imaging system that has gained widespread acceptance in several fields of medicine. MRI is a technology that uses a powerful magnetic field and pulses of radio waves to create detailed images of the body's internal organs, tissues, and structures. During an MRI, a patient is placed at the center of an extremely strong magnetic field and bodily tissue information is obtained by measuring how atoms respond to pulses of radiofrequency energy sent from a scanner. MRI images provide anatomical information, as well as functional information, that can be used to help diagnose a variety of conditions, as well as plan for, guide, and monitor treatment. As MRI relies on a magnetic field and radio frequencies and does not use ionizing radiation, there are no known health hazards, making MRI a safe alternative to many other imaging methods.

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[56] *Id.* at 864.
[57] *Id.*
[58] *Id.*
[59] *Id.*
[60] Z. Saad et al., *Integrated PET/MRI: The new tool in multimodality imaging*, 39 RAD MAGAZINE 463, 15-16 (2013).
[61] Saad, *supra*; Drew A. Torigian et al., *PET/MR Imaging: Technical Aspects and Potential Clinical Applications*, 267 RADIOLOGY 26-44 (Apr. 2013); J.-W. Shin et al., *Clinical Applications of Simultaneous PET/MR Imaging Using (R)-[11C]-Verapamil with Cyclosporin A: Preliminary Results on a Surrogate Marker of Drug-Resistant Epilepsy*, 37 AM. J. NEURORADIOL. 600–06 (Apr. 2016).
[62] Henryk Barthel et al., *PET/MR in Dementia and Other Neurodegenerative Diseases*, 45 SEMIN NUCL MED. 3, 224-33, 224 (May 2015); C. Ismini Mainta et al., *FDG PET/MR imaging in major neurocognitive disorders*, 14 CURRENT ALZHEIMER RESEARCH 2 (2017).
[63] Barthel, *supra*; Saad, *supra* note 60.

Over the last four decades, technical and engineering advances have yielded MRI systems with higher field strengths, and today most clinical MRIs operate at field strengths of 1.5T or 3T.[64] Clinical application of higher magnetic field strengths, such as 3T, has several advantages. Most notably, increased magnetic field strength is associated with better diagnostic image quality (i.e. higher resolution images, better contrast between different tissues, and increased ability to image smaller structures with improved resolution).[65] Additionally, as compared to 1.5T MRI, 3T allows for faster scan times, which provides convenience for both physicians and patients and increases availability of the resource.[66]

Research into the various uses and benefits of 3T MRI is extensive, with studies focusing on specific diseases, as well as parts of the body that may benefit from this higher-strength imaging modality. The higher resolution of the 3T MRI produces more detailed images, which are beneficial when diagnosing oncological, neurological, and musculoskeletal conditions affecting these areas of the body.[67] As it relates to brain imaging, MRI is the modality of choice as it provides the most sensitive imaging of the head and can help diagnose brain tumors, stroke, and infections, among a number of other conditions.[68] Specifically, MRI offers exceptional anatomical and functional detail that can be used to describe the shape, size, and integrity of gray and white matter structures in the brain and detect pathological changes.[69] For instance, MRI is used to determine the exact location of a lesion to establish a plan for treatment/biopsy planning; evaluate mass effect on the brain, ventricular system, and vasculature; and suggest a possible diagnosis.[70] In addition to conditions affecting the brain, MRI also demonstrates clinical utility in diagnosing a wide spectrum of spinal and musculoskeletal conditions due to its ability to noninvasively display high definition images of the bones, cartilage, muscles, tendons, ligaments, and joints.[71] MRI is often used to obtain better images of a bone mass first seen on an x-ray, can show if the mass is a tumor, an infection, or some other damage, and can also help make a specific diagnosis when a lesion is indeterminate or shows signs of aggressiveness.[72] MRI scans have the ability to show the extent of a tumor, the marrow inside

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[64] Beth W. Orenstein, *4T, 7T, 8T, and Beyond — High-Field MR Research Seeks a Closer Look Inside the Human Body*, 10 RADIOLOGY TODAY 16 (2009), *available at* http://www.radiologytoday.net/archive/050409p16.shtml.
[65] *Why the 3 Tesla MRI is the Best Scanner for Diagnostic Imaging*, RADIOLOGY AFFILIATES IMAGING (Sep. 12, 2016), https://4rai.com/blog/why-the-3-tesla-mri-is-the-best-scanner-for-diagnostic-imaging.
[66] *Why the 3 Tesla MRI is the Best Scanner for Diagnostic Imaging*, *supra* note 65.
[67] *Why the 3 Tesla MRI is the Best Scanner for Diagnostic Imaging*, *supra* note 65.
[68] *Magnetic Resonance Imaging (MRI) – Head,* RADIOLOGYINFO.ORG, https://www.radiologyinfo.org/en/info.cfm?pg=headmr (last reviewed Feb. 5, 2019); M. Symms et al., *A review of structural magnetic resonance neuroimaging*, 75 J. NEUROLOGY, NEUROSURGERY & PSYCHIATRY 1235 (2004), *available at* http://jnnp.bmj.com/content/jnnp/75/9/1235.full.pdf; *What is fMRI?*, UC SAN DIEGO CTR. FOR FUNCTIONAL MRI, http://fmri.ucsd.edu/Research/whatisfmri.html (last visited Mar. 29, 2019); Marc C. Mabray et al., *Modern Brain Tumor Imaging,* 3 BRAIN TUMOR RESEARCH & TREATMENT 8 (2015), *available at* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4426283/.
[69] Symms, *supra* note 68; *What is fMRI?*, *supra* note 68.
[70] Mabray, *supra* note 68.
[71] Gail Dean Deyle, *The role of MRI in musculoskeletal practice: a clinical perspective*, 19 J. MANUAL & MANIPULATIVE THERAPY 152 (2011), *available at* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3143009/; Maravi et al., *Role of MRI in Orthopaedics*, 21 ORTHOPAEDIC J. M.P. CHAPTER 74 (2015), *available at* https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=2ahUKEwiS093T19PaAhWEiOAKHcguA_UQFjABegQIABA8&url=http%3A%2F%2Fwww.ojmpc.com%2Findex.php%2FOJMPC%2Farticle%2Fdownload%2F31%2F25&usg=AOvVaw3hriKb3xbWliXUT_yczE1K; Apostolos H. Karantanas, *What's new in the use of MRI in the orthopaedic trauma patient?*, 45 INT'L J. CARE INJURED 923 (2014), *available at* https://www.injuryjournal.com/article/S0020-1383(14)00023-0/pdf; Filippo Del Grande, *Getting the Most Out of 3 Tesla MRI of the Spine*, 29 RHEUMATOLOGY NETWORK (Mar. 3, 2012), *available at* http://www.rheumatologynetwork.com/articles/getting-most-out-3-tesla-mri-spine.
[72] *Tests for Bone Cancer,* AM. CANCER SOC'Y, https://www.cancer.org/cancer/bone-cancer/detection-diagnosis-staging/how-diagnosed.html (last updated Feb. 5, 2018); *Tests for Osteosarcoma,* AM. CANCER SOC'Y, https://www.cancer.org/cancer/osteosarcoma/detection-diagnosis-staging/how-diagnosed.html (last updated Jan. 30,

the bone, and the soft tissue around a tumor, and is the preferred modality to determine if a tumor has grown.[73] In all of these areas of the body, the improved resolution and clarity of the 3T MRI has the added benefit of allowing radiologists to identify smaller lesions and anatomical structures that cannot be seen with less powerful machines, such as a 1.5T MRI.[74]

Additionally, 3T MRI creates detailed images that can show the difference between normal and abnormal tissue, and therefore, is the preferred imaging modality for the prostate and breast.[75] Prostate MRI at 3T has advantages including increases in spatial resolution and high local staging accuracy, is considered to be superior to 1.5T MRI in detecting and locating lesions, and has the potential to improve the prostate cancer detection rate on first biopsy.[76] Moreover, because the magnet is so powerful, prostate cancer screening on the 3T MRI does not require use of the invasive endorectal coil that scans on the 1.5T MRI machines often involve, and therefore provides greater patient comfort.[77] In the breast, multiple studies have shown that MRI is the most sensitive means of assessing the extent of malignancy in women diagnosed with breast cancer.[78] The higher magnetic field strength allows for improvements in spatial and temporal resolution and the greater spectral separation of fat and water at 3T imaging enables superior fat suppression, further aiding in the visualization of enhancing lesions.[79] These studies suggest that 3T MRI is more accurate for pre-operative assessment of breast cancer extent, and therefore, that 3T MRI can be a valuable guide to surgical planning and a valuable tool in improving treatment outcomes.[80]

F.1.b.ii **Public Health Value /Outcome-Oriented:**

Describe the impact of the Proposed Project and how the Applicant will assess such impact. Provide projections demonstrating how the Proposed Project will improve health outcomes, quality of life, or health equity. Only measures that can be tracked and reported over time should be utilized.

2018); Duarte Nascimento et al, *The role of magnetic resonance imaging in the evaluation of bone tumours and tumour-like lesions,* 5 INSIGHTS IMAGING 419 (2014), *available at* https://link.springer.com/content/pdf/10.1007%2Fs13244-014-0339-z.pdf.

[73] *Tests for Osteosarcoma, supra* note 72; Nascimento, *supra* note 72; *MRI for Cancer*, AM. CANCER SOC'Y, https://www.cancer.org/treatment/understanding-your-diagnosis/tests/mri-for-cancer.html (last updated Nov. 30, 2015).

[74] *Why the 3 Tesla MRI is the Best Scanner for Diagnostic Imaging, supra* note 65.

[75] William A. Faulkner, *1.5T Versus 3T,* MEDTRONIC (Nov. 2015), http://www.medtronic.com/mrisurescan-us/pdf/UC201405147a_EN_1_5T_Versus_3T_MRI.pdf; Reni S. Butler et al., *3.0 Tesla vs 1.5 Tesla breast magnetic resonance imaging in newly diagnosed breast cancer patients*, 5 WORLD J. RADIOLOGY 285 (2013), *available at* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3758496.

[76] Faulkner, *supra*; Jurgen J. Futterer et al, *3T MRI of prostate cancer*, APPLIED RADIOLOGY (Feb. 12, 2009), https://www.appliedradiology.com/articles/3t-mri-of-prostate-cancer; Jie Chen et al., *3-Tesla magnetic resonance imaging improves the prostate cancer detection rate in transrectral ultrasound-guided biopsy*, 9 EXPERIMENTAL & THERAPEUTIC MED. 207 (2015), *available at* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4247284/.

[77] *Magnetic Resonance Imaging (MRI) – Prostate*, RADIOLOGYINFO.ORG, https://www.radiologyinfo.org/en/info.cfm?pg=mr_prostate (last reviewed July 16, 2018); *Non-Invasive 3T MRI Scan Could Be a Game-Changer in Prostate Health*, SOUTH JERSEY RADIOLOGY ASSOCIATES (Jun. 9, 2016), https://www.mdtmag.com/article/2016/06/non-invasive-3t-mri-scan-could-be-game-changer-prostate-health; Sangeet Ghai & Masoom A. Haider, *Multiparametric-MRI in diagnosis of prostate cancer*, 31 INDIAN J. UROLOGY 194 (2015), *available at* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4495493/; Faulkner, *supra* note 75.

[78] Butler, *supra* note 75; Habib Rahbar et al., *Accuracy of 3T versus 1.5T breast MRI for pre-operative assessment of extent of disease in newly diagnosed DCIS*, 84 EUROPEAN J. RADIOLOGY 611 (2015), *available at* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4348176/.

[79] Butler, *supra* note 75; Rahbar, *supra*.

[80] Rahbar, supra note 78.

A. Expansion of Imaging Services at MGH's Main Campus: Improving Health Outcomes and Quality of Life

The Applicant anticipates that the Proposed Project will provide patients with needed access to high-quality PET/MR and MRI services, which in turn will improve health outcomes and quality of life. Research indicates that delayed access to quality health care negatively affects patient satisfaction as well as health outcomes due to delays in diagnosis and treatment.[81] Since quality of life is a multidimensional concept that includes aspects of physical health, delayed access to care also results in decreased quality of life.[82] Through the addition of a PET/MR and the expansion of MRI capacity, the Applicant will improve access to timely, high-quality imaging services, and thereby enhance patient satisfaction, health outcomes, and quality of life for MGH patients.

Additionally, the Proposed Project will ensure continued provision of high-quality care. High-quality services are currently available at MGH and the addition of PET/MR and the expansion of MRI services will follow similar care models. Presently, high-quality patient outcomes are achieved through utilization of multi-focused quality assurance programs and mechanisms that assess the clinical appropriateness, safety, and quality of all services offered to MGH's patients. These programs and mechanisms address a range of clinical and operational aspects to ensure achievement of high-quality clinical outcomes.

B. Additional Strategies for Improving Patient Experience and Ensuring High Quality Outcomes for All Services at MGH

The Applicant and MGH are committed to developing and implementing population health management ("PHM") strategies to ensure high quality outcomes and an exceptional care experience for all patients. Currently, MGH is in the midst of a ten-year strategic plan aimed at improving patient experience and clinical quality outcomes, as well as reducing the costs associated with care. Every clinical department at MGH, including imaging, has a PHM strategy. These strategies are aimed at improving quality, efficiency and patient experience, such as care models that are rooted in collaboration, including patient-centered medical homes, care integration and other care initiatives specifically designed by MGH clinicians. Consequently, MGH offers a number of programs to ensure quality care for patients.

First, MGH staff participate in the eConsult Program. Through the eConsult program, PCPs and specialists, such as radiologists, consult (as needed) through a non-face-to-face electronic interaction that seeks to ensure patients receive appropriate services, while avoiding any unnecessary higher cost consultations. Through this program, PCPs initiate an eConsult order through the hospital's electronic health record ("EHR"). For radiology patients, within three business days, the PCP will be provided with structured guidance from a radiologist on a particular question about a specific patient. Through this program, clinical decision support in the EHR and physician-level variation reporting minimize inappropriate ordering of radiology and other high-cost diagnostic tests by a PCP and ensure patients receive the right care.

Second, for MGH's highest risk and most complex patients, clinical staff offer the Integrated Care Management program ("iCMP"). iCMP provides eligible patients with a care manager who

[81] Julia C. Prentice & Steven D. Pizer, *Delayed Access to Health Care and Mortality*, 42 HEALTH SERVICES RESEARCH 644 (2007), *available at* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1955366/.
[82] *Health-Related Quality of Life & Well-Being*, HEALTHYPEOPLE.GOV, https://www.healthypeople.gov/2020/topics-objectives/topic/health-related-quality-of-life-well-being (last visited Mar. 29, 2019).

develops a care plan in collaboration with the patient and other members of the clinical team. The care manager works in-person and telephonically to coordinate a patient's care to reduce hospital readmissions when possible. Additionally, the care manager connects patients with community-based resources that facilitate recovery. MGH also offers the Patients Linked to Urgent Supports ("PLUS") program. This program provides intensive wrap-around services (psycho-social supports) to appropriate patients. Services include acute community paramedicine, crisis stabilization units, and coordinated transportation. All of these programs work to assure that MGH's patients have the highest quality care coordination along the care continuum and reduce health care costs.

Third, MGH offers alternative care pathways to patients, so they may avoid unnecessary visits to the emergency department or inpatient hospitalizations. The Partners Mobile Observation Unit ("PMOU") is a program that provides home-based urgent care for patients experiencing at-risk medical events that can be addressed with enhanced home care. Additionally, MGH's Home Hospital Program offers daily hospital-level care at home through team-based care.

Through the Proposed Project, the Imaging Department will offer these programs to patients, thereby ensuring improved quality outcomes for patients and overall patient experience. For all patients access to these critically needed services will allow them to receive appropriate and timely care, as well as address any social determinant of health challenges. By providing access to these PHM strategies, MGH provides holistic care, which in turn ensures higher quality outcomes, satisfaction and continuity for patients.

C. Assessing the Impact of the Proposed Project

To assess the impact of the Proposed Project, MGH developed the following quality metrics and reporting schematic, as well as metric projections for indicators that will measure patient satisfaction, access and quality of care. The measures are discussed below.

1. **Patient Satisfaction:** Patients that are satisfied with care are more likely to seek additional treatment when necessary. MGH staff will review overall ratings of care with imaging services via Press Ganey Survey scores.

   Measure: Overall rating of Care – Response Options, include: Very Good, Good, Fair, Poor and Very Poor.

   Projections: Baseline: 87% Year 1: 87% Year 2: 89% Year 3: 90%

   Monitoring: Any category receiving a less than "Good" rating will be evaluated and policy changes instituted as deemed appropriate.

2. **Access – Wait Times:** The Proposed Project seeks to ensure access to PET/MR and MRI services. Accordingly, MGH will track the time to appointment. This information will be obtained via the EHR system, EPIC.

   Measure: Time interval (in days) from when the case was initiated for scheduling in EPIC to the next available outpatient appointment.

   MRI Projections: Baseline: 18 days Year 1: 17 days Year 2: 16 days Year 3: 16 days

   Monitoring: This data will be reviewed quarterly by clinical staff.

3. **Quality of Care – Reporting of Critical Value Results:** MGH adheres to a Communication of Critical Results Policy, which defines the requirement and process for verifiable and timely communication of critical test results to the responsible physician. To facilitate timely reporting and communication of critical test results, radiologists currently use a home-grown system called Important Findings Alert ("IFA"). IFA works in combination with PowerScribe 360, which is a widely used real-time radiology reporting and communication platform that enables quick, efficient generation of high-quality reports and delivery of communications concerning critical test results. Specifically, radiologists use PowerScribe 360 to embed specific text in their reports, and IFA analyzes all reports and, if it detects the specific text indicating critical tests results, triggers an alert to the responsible physician. Pursuant to MGH's Communication of Critical Results Policy, when an alert regarding a critical test results is triggered, the responsible physician is notified via "verifiable and timely communication." Examples of verifiable communication are by telephone or in person. Subsequently, this communication is documented.

   Measure: Number of radiologists conducting critical value reporting on cases being interpreted.

   Projections: Baseline: 100% Year 1: 100% Year 2: 100% Year 3: 100%

   Monitoring: PET/MR and MRI scans will be forwarded to the film library and follow-up will be conducted to the referring physician. The radiologist will be available to answer any questions.

F1.b.iii **Public Health Value /Health Equity-Focused:**

For Proposed Projects addressing health inequities identified within the Applicant's description of the Proposed Project's need-base, please justify how the Proposed Project will reduce the health inequity, including the operational components (e.g. culturally competent staffing). For Proposed Projects not specifically addressing a health disparity or inequity, please provide information about specific actions the Applicant is and will take to ensure equal access to the health benefits created by the Proposed Project and how these actions will promote health equity.

To ensure health equity for all patients, including those deemed underserved, the Proposed Project will not affect accessibility of MGH's services for poor, medically indigent, and/or Medicaid eligible individuals. MGH does not discriminate based on ability to pay or payer source and this practice will continue following implementation of the Proposed Project. As further detailed throughout this narrative, the Proposed Project will increase access to high quality PET/MR and MRI imaging services for all patients in a number of ways.

Over the past decade, MGH has launched a variety of diversity initiatives to address healthcare disparities, increase the percentage of employees from underrepresented groups, build trust among people of diverse backgrounds and evaluate the hospital's progress. Given these efforts, MGH was recently named one of the nation's top ten hospitals and health systems on diversity issues by Diversity Inc., a publication that monitors best practices in the field. With these goals and MGH's commitment to increasing the number of employees from underrepresented groups, the hospital's staff represent various races and ethnicities. Through the Proposed Project,

patients will have access to culturally competent staffing through a clinical staff representative of various races and ethnicities.

Moreover, Partners HealthCare, and specifically MGH, has also adopted the Culturally and Linguistically Appropriate Service ("CLAS") standards set forth by the U.S. Department of Health and Human Services Office of Minority Health for all practice sites. MGH provides effective, understandable, and respectful care with an understanding of patients' cultural health beliefs and practices and preferred languages. Additionally, MGH has arrangements to offer ongoing education and training in culturally and linguistically appropriate areas for staff at all levels and across all disciplines.

In regard to interpreter services, MGH provides staff interpreters that speak eleven languages, including American Sign Language ("ASL"). Interpretations for encounters that occur at MGH's main campus staff are documented in a centralized Interpreter Services Tracking System, which contains a reporting tool for year-end statistics of positive encounters. MGH staff review the annual statistics and seek ways to improve these services.

Finally, all Partners HealthCare hospitals, including MGH participate in the American Hospital Association's #123Equity Pledge Campaign. This Campaign seeks to eliminate health and health care disparities that exist for racially, ethnically and culturally diverse individuals. The campaign requires hospital leaders to accelerate progress in the following areas: (1) Increasing the collection and use of race, ethnicity, language preference and other socio-demographic data; (2) Increasing cultural competency training; and (3) Increasing diversity in leadership and governance. Currently, all Partners HealthCare hospitals participate in the Campaign. This Campaign will allow MGH staff to ensure equal access to the benefits created by the Proposed Project.

F1.b.iv **Provide additional information to demonstrate that the Proposed Project will result in improved health outcomes and quality of life of the Applicant's existing Patient Panel, while providing reasonable assurances of health equity.**

The Proposed Project seeks to expand timely access to PET/MR and MRI services. By providing patients with needed and timely access to these services, patient wait times for MRI services will be reduced. In addition, the availability of PET/MR services will offer improved imaging for certain conditions. Timely treatment often ensures fewer complications, leading to reduced emergency department visits and hospitalizations and improved health outcomes. Moreover, expedited access to care may lead to a reduction in disease/condition-related complications, such as pain, depression and a reduced ability to participate in activities that directly impact a patient's quality of life. Finally, access to PET/MR and MRI services will lead to expedited quality care as additional imaging information allows clinicians to determine the best treatment for a patient.

F1.c **Provide evidence that the Proposed Project will operate efficiently and effectively by furthering and improving continuity and coordination of care for the Applicant's Patient Panel, including, how the Proposed Project will create or ensure appropriate linkages to patients' primary care services.**

To ensure continuity of care, improved health outcomes and enhanced quality of life, MGH imaging staff will continue existing formal processes for linking patients with their primary care

physicians and community specialists for follow-up care, as well as case management/social work support to ensure patients have access to resources around social determinant of health ("SDoH") issues. Providing patients with linkages to these necessary services prevents unnecessary readmissions, ensures appropriate care management and provides the patient with the resources for improving underlying issues that impact health. Moreover, patients at MGH will benefit from MGH's well-developed PHM strategies, including an existing system of care coordination and care delivery alternatives aimed at improving patient experience and outcomes.

MGH has a number of integrated care programs in place to ensure continuity of care and care integration. In addition to programs, such as eConsult, MGH assists patients with linkages to care and SDoH through care managers who follow-up with patients after ambulatory procedures. These care manager's follow-up with patients telephonically to provide medication reconciliation and coordinate care with clinicians to optimize recovery. Moreover, and as discussed, MGH also offers a number of alternatives to emergency department care for patients through PMOU, a program that provides home-based urgent care for patients experiencing at-risk medical events believed to be treatable with enhanced home care. Accordingly, these efforts and initiatives ensure patients are appropriately linked to care integration resources.

F1.d **Provide evidence of consultation, both prior to and after the Filing Date, with all Government Agencies with relevant licensure, certification, or other regulatory oversight of the Applicant or the Proposed Project.**

Since a broad range of input is valuable in the planning of a project, the Applicant carried out a diverse consultative process with individuals at various regulatory agencies regarding the Proposed Projects. The following individuals are some of those consulted regarding this Project:

- Department of Public Health: Nora Mann, Director, Determination of Need Program; Rebecca Rodman, Deputy General Counsel; and Ben Wood, Director, Office of Community Health Planning and Engagement.
- MassHealth: Steven Sauter, Director, Acute Hospital Program, MassHealth Office of Providers and Plans and David Garbarino, Director of Purchasing Strategy and Analytics at Executive Office of Health and Human Services – MassHealth.

F1.e.i **Process for Determining Need/Evidence of Community Engagement:**
For assistance in responding to this portion of the Application, Applicant is encouraged to review *Community Engagement Standards for Community Health Planning Guideline.* With respect to the existing Patient Panel, please describe the process through which Applicant determined the need for the Proposed Project.

A. Community Engagement Regarding the Addition of a PET/MR for Part-Time Clinical Use and the Addition of MRI Capacity.

Based upon demand by MGH's patient panel for PET/MR and MRI services, MGH plans to add a part-time PET/MR for clinical use and to use the MRI capability of the PET/MR unit to address MRI scanning backlogs. In an effort to ensure appropriate community engagement, the Proposed Project was presented at a community forum at MGH on January 3, 2019. Patients, providers, neighbors and other parties were encouraged to attend the presentation

to provide feedback. Overall feedback from the meeting was very positive and supportive of the plan. There were no concerns expressed by this group.

F1.e.ii **Please provide evidence of sound Community Engagement and consultation throughout the development of the Proposed Project. A successful Applicant will, at a minimum, describe the process whereby the "Public Health Value" of the Proposed Project was considered, and will describe the Community Engagement process as it occurred and is occurring currently in, at least, the following contexts: Identification of Patient Panel Need; Design/selection of DoN Project in response to "Patient Panel" need; and Linking the Proposed Project to "Public Health Value".**

To ensure sound community engagement throughout the development of the Proposed Project, the Applicant in conjunction with MGH took the following actions:

- Held a community forum on the Benefits and Need for a PET/MR on January 3, 2019.

For transparency and to educate the community regarding the public health value of the Proposed Project, MGH developed a presentation to provide at the aforementioned community forum. This presentation documents the components of the Proposed Project and the patient panel need that the Project will meet, as well as the impact of the Proposed Project including its public health value (see Attachment 4d).

Factor 2: Health Priorities

Addresses the impact of the Proposed Project on health more broadly (that is, beyond the Patient Panel) requiring that the Applicant demonstrate that the Proposed Project will meaningfully contribute to the Commonwealth's goals for cost containment, improved public health outcomes, and delivery system transformation.

F2.a. **<u>Cost Containment:</u>**
Using objective data, please describe, for each new or expanded service, how the Proposed Project will meaningfully contribute to the Commonwealth's goals for cost containment.

The goals for cost containment in Massachusetts focus on providing low-cost care alternatives without sacrificing high quality. In fact, the Commonwealth's independent state agency that develops policy to reduce health care cost growth and improve the quality of patient care, the Health Policy Commission, has a stated goal of bettering health and care at a lower cost across the Commonwealth. As described below, the Proposed Project will meaningfully contribute to Massachusetts' goals for cost containment. As previously discussed, PET/MRI functionality allows clinicians to obtain additional clinical information regarding a patient's condition or disease-state as compared to PET/CT. This additional information allows clinicians to more accurately diagnosis and develop a treatment plan for patients. Enhanced accuracy in diagnosis reduces the performance of unnecessary testing and treatment. Consequently, PET/MR imaging is a lower cost alternative to other scans for specific patients, and as such saves patients and providers monies, leading to overall lower TME.

F2.b. **Public Health Outcomes:**
Describe, as relevant, for each new or expanded service, how the Proposed Project will improve public health outcomes.

The need to develop additional advanced imaging capacity at MGH to improve public health outcomes is demonstrated by population projections which suggest that imaging demand will grow into the future, particularly as the 65+ patient population grows and requires advanced imaging techniques, such as PET/MR and MRI, to diagnose and treat age-related conditions. To address this projected demand for advanced diagnostic imaging services in the state, increased capacity is required. The addition of PET/MR and the expansion of MRI services at MGH's main campus will improve public health outcomes as patients will have access to high-quality services for complex and age-related conditions.

F2.c. **Delivery System Transformation:**
Because the integration of social services and community-based expertise is central to goal of delivery system transformation, discuss how the needs of their patient panel have been assessed and linkages to social services organizations have been created and how the social determinants of health have been incorporated into care planning.

As outlined in Section F.1.B.ii, MGH has numerous programs in place to ensure linkages to social service organizations, such as through the iCMP for high-risk, chronically ill patients. Additionally, as part of the transition to the MassHealth ACO model of care, the Applicant and MGH have implemented a universal screening program for SDoH, such as: housing, food insecurity, finances, childcare, transportation, and literacy. Currently, staff are working to connect patients to internal and external resources if the patient screens positive in any of the SDoH domains.

Factor 5: Relative Merit

F5.a.i **Describe the process of analysis and the conclusion that the Proposed Project, on balance, is superior to alternative and substitute methods for meeting the existing Patient Panel needs as those have been identified by the Applicant pursuant to 105 CMR 100.210(A)(1). When conducting this evaluation and articulating the relative merit determination, Applicant shall take into account, at a minimum, the quality, efficiency, and capital and operating costs of the Proposed Project relative to potential alternatives or substitutes, including alternative evidence-based strategies and public health interventions.**

Proposal: Addition of the PET/MR and the expansion of MRI services for part-time clinical use.

Quality: Access to PET/MR services in the clinic setting will benefit patients with certain conditions, such as oncologic, cardiovascular, neurologic, muskulo-skeletal and gastrointestinal conditions, leading to enhanced accuracy in prognosis, staging and the creation of appropriate treatment plans.

Efficiency: PET/MR provides clinicians with additional information and better scan images leading to a reduction in unnecessary imaging and more accurate treatment selection. These efficiencies lead to reduced costs for healthcare market.

Capital Expense: The capital expense for the Proposed Project is $8,075,886. These costs include the construction, as well as the equipment and architectural costs.

Operating Costs: The proposed operating expenses for the Proposed Project over the next five years are: Year 1: $1,597,885; Year 2: $1,999,075; Year 3: $2,046,174; Year 4: $2,082,855; and Year 5: $2,120,299.

List alternative options for the Proposed Project:

Option 1

Alternative Proposal: Use of the PET/MR for research use only.

Alternative Quality: The aging population has an increased incidence of numerous health conditions that require advanced imaging, such as PET/MR and MRI for the most accurate diagnosis and treatment approaches. Without access to these necessary imaging services for diagnosis, staging and development of appropriate treatment plans, patients' clinical quality outcomes may be negatively impacted as these modalities are the best forms of imaging for certain conditions.

Alternative Efficiency: No clinical efficiencies would be created if the PET/MR is not added to the complement of advanced imaging services offered at MGH.

Alternative Capital Expenses: There are no operating costs associated with this alternative; however, this option would not allow MGH to meet the imaging needs of its aging patient panel.

Alternative Operating Costs: It is not cost effective to perform research-only scans in a clinical environment that utilizes clinical space without a benefit to patients. Although operating costs for this alternative are standard, this alternative does not allow MGH to meet the imaging needs of its aging patient panel.

Attachment/Exhibit

2

Total PHS Patient Panel

	FY16		FY17		FY18YTD	
	Count	%	Count	%	Count	%
PHS Total	1,377,250		1,403,853		1,500,670	
Gender						
Female	805,448	56.3%	818,124	58.5%	872,697	58.3%
Male	571,351	39.8%	585,443	41.5%	627,825	41.7%
Other/Unknown	451	3.9%	286	0.0%	148	0.0%
Age						
0-17	143,253	10.4%	155,500	11.1%	178,975	11.9%
18-64	850,312	61.7%	871,216	62.1%	930,683	62.0%
65+	383,321	27.8%	376,929	26.8%	390,969	26.1%
Unknown	364	0.0%	208	0.0%	43	0.0%
Race						
American Indian or Alaska Native	1,498	0.1%	1,591	0.1%	1,871	0.1%
Asian	54,775	4.0%	57,725	4.1%	61,569	4.1%
Black or African American	78,763	5.7%	80,196	5.7%	82,416	5.5%
Hispanic/Latino	24,770	1.8%	23,343	1.7%	21,839	1.5%
Native Hawaiian or Other Pacific Islander	1,025	0.1%	1,131	0.1%	1,132	0.1%
Other/Unknown	214,569	15.6%	222,950	15.9%	251,456	16.8%
White	1,001,850	72.7%	1,016,917	72.4%	1,080,387	72.0%
Patient Origin						
HSA_1	12,581	0.9%	13,558	1.0%	90,977	6.1%
HSA_2	47,426	3.4%	47,539	3.4%	49,077	3.3%
HSA_3	88,410	6.4%	89,820	6.4%	95,780	6.4%
HSA_4	623,435	45.3%	636,655	45.4%	654,363	43.6%
HSA_5	205,344	14.9%	213,194	15.2%	204,213	13.6%
HSA_6	247,239	18.0%	247,483	17.6%	244,578	16.3%
In MA but not in HSA 1-6	100	0.0%	75	0.0%	45	0.0%
Outside of MA	144,003	10.5%	148,781	10.6%	155,302	10.3%
Unknown	8,712	0.6%	6,748	0.5%	6,335	0.4%

Date Pulled: 11/20/2018

FY19YTD	
Count	%
398,563	
241,252	58.2%
157,274	41.8%
37	0.0%
35,370	8.9%
232,720	58.4%
130,462	32.7%
11	0.0%
405	0.1%
15850	4.0%
22163	5.6%
7436	1.9%
249	0.1%
45826	11.5%
306634	76.9%
25,075	6.3%
11,741	2.9%
16,972	4.3%
198,060	49.7%
43,392	10.9%
73,544	18.5%
6	0.0%
28,809	7.2%
964	0.2%

Total MGH Patient Panel

	FY16		FY17		FY18YTD		FY19YTD	
	Count	%	Count	%	Count	%	Count	%
MGH Total	*563,470*		*563,976*		*566,357*		*149,595*	
Gender								
Female	312,827	55.5%	312,523	55.4%	312,484	55.2%	84,632	56.6%
Male	250,568	44.5%	251,412	44.6%	253,846	44.8%	64,950	43.4%
Other/Unknown	75	0.0%	41	0.0%	27	0.0%	13	0.0%
Age								
0-17	70,961	12.6%	76,740	13.6%	81,023	14.3%	19,912	13.3%
18-64	335,154	59.5%	334,773	59.4%	335,741	59.3%	83,321	55.7%
65+	157,312	27.9%	152,455	27.0%	149,588	26.4%	46,360	31.0%
Unknown	43	0.0%	8	0.0%	5	0.0%	2	0.0%
Race								
American Indian or Alaska Native	550	0.1%	527	0.1%	580	0.1%	119	0.1%
Asian	27,411	4.9%	28,324	5.0%	29,291	5.2%	7,847	5.2%
Black or African American	30,645	5.4%	30,211	5.4%	29,495	5.2%	7,746	5.2%
Hispanic/Latino	4,995	0.9%	4,914	0.9%	4,645	0.8%	1,393	0.9%
Native Hawaiian or Other Pacific Islander	266	0.0%	290	0.1%	291	0.1%	87	0.1%
Other/Unknown	76,371	13.6%	80,512	14.3%	88,700	15.7%	20,615	13.8%
White	423,232	75.1%	419,198	74.3%	413,355	73.0%	111,788	74.7%
Patient Origin								
HSA_1	6,402	1.1%	6,637	1.2%	7,174	1.3%	1,604	1.1%
HSA_2	17,800	3.2%	18,032	3.2%	18,211	3.2%	4,136	2.8%
HSA_3	32,113	5.7%	32,409	5.7%	32,725	5.8%	8,429	5.6%
HSA_4	268,514	47.7%	272,341	48.3%	278,900	49.2%	83,400	55.8%
HSA_5	57,646	10.2%	55,938	9.9%	48,576	8.6%	10,324	6.9%
HSA_6	104,188	18.5%	100,189	17.8%	98,075	17.3%	26,124	17.5%
In MA but not in HSA 1-6	33	0.0%	23	0.0%	20	0.0%	1	0.0%
Outside of MA	73,197	13.0%	75,209	13.3%	79,819	14.1%	15,117	10.1%
Unknown	3,577	0.6%	3,198	0.6%	2,857	0.5%	460	0.3%

Date Pulled: 11/20/2018

PHS Panel Notes:

Entities include -

Massachusetts General Hospital
Brigham and Women's Hospital
Newton Wellesley Hospital
North Shore Medical Center
Brigham and Women's Faulkner Hospital
Martha's Vineyard Hospital[1]
Nantucket Cottage Hospital[1]
Cooley Dickinson Hospital[1]
Massachusetts Eye and Ear Infirmary[2]
Spaulding Rehabilitation Hospital[3]
McLean Hospital[1]
Massachusetts General Physicians Organization
Brigham and Women's Physicians Organization
North Shore Physicians Group
Newton Wellesley Medical Group
Cooley Dickinson PHO[1]
Partners Community Physicians Organization[4]

1. Only includes post-Epic data
2. Outpatient post-Epic data only. Does not include inpatient data
3. Telehealth, Partners Mobile Observation Unit (PMOU), Home Hospital (HH) programs for GH and BWH, Stay Connected with GH , Lifeline, CareSage programs are not included

4.Pre-Epic non-risk patients not included

MGH Panel Notes:

Data include MGH and MGPO[1]

1. Only includes post-Epic data (Practices have varying go-live dates)

Source: SAM Patients Served tables that use data from the Integration, Patient Financials, Payer, and Epic source marts

ELECTROPHYSIOLOGY LAB DATA

Total MGH EP Lab Patient Panel

	FY16		FY17		FY'18		FY'19Q1	
	Count	%	Count	%	Count	%	Count	%
MGH Total Unique Patients	1,871		2,390		2,980		825	
Gender								
Male	1,242	66%	1,542	65%	1,974	66%	540	65%
Female	629	34%	848	35%	1,005	34%	284	34%
Other/Unknown	-	0%	-	0%	1	0%	1	0%
Age								
0-17	6	0%	10	0%	17	1%	2	0%
18-64	699	37%	896	37%	1,120	38%	272	33%
65+	1,166	62%	1,484	62%	1,843	62%	551	67%
Race								
White	1,650	88%	2,115	88%	2,612	88%	729	88%
Black or African American	51	3%	69	3%	86	3%	22	3%
American Indian or Alaska Native	2	0%	1	0%	3	0%	-	0%
Asian	44	2%	51	2%	67	2%	19	2%
Native Hawaiian or Other Pacific Islander	-	0%	-	0%	1	0%	-	0%
Hispanic/Latino	5	0%	12	1%	11	0%	2	0%
Other/Unknown	119	6%	142	6%	200	7%	53	6%
Patient Origin								
HSA_1	19	1%	31	1%	33	1%	13	2%
HSA_2	54	3%	86	4%	119	4%	29	4%
HSA_3	146	8%	163	7%	216	7%	59	7%
HSA_4	880	47%	1,054	44%	1,272	43%	373	45%
HSA_5	201	11%	295	12%	323	11%	89	11%
HSA_6	319	17%	414	17%	550	18%	120	15%
Outside of MA	245	13%	335	14%	454	15%	138	17%
International	7	0%	12	1%	10	0%	3	0%
Unknown	-	0%	-	0%	3	0%	1	0%

MGH Total Visits	2,625	3,121	3,606	883

EP Data

	FY'16			FY'17	
Top 10 Diagnosis	Count	%	Top 10 Diagnosis	Count	%
Persistent Atrial Fibrillation	240	13%	Persistent Atrial Fibrillation	456	19%
Paroxysmal Atrial Fibrillation	210	11%	Paroxysmal Atrial Fibrillation	299	13%
Unspecified Atrial Fibrillation	141	8%	Sick Sinus Syndrome	121	5%
Sick Sinus Syndrome	100	5%	Supraventricular Tachycardia	121	5%
Supraventricular Tachycardia	94	5%	Atrioventricular Block, Complete	89	4%
Encntr For Adjust And Mgmt Of Automatic Implntbl Card Defib	92	5%	Typical Atrial Flutter	86	4%
Ventricular Tachycardia	68	4%	Syncope And Collapse	84	4%
Syncope And Collapse	66	4%	Ventricular Tachycardia	82	3%
Typical Atrial Flutter	62	3%	Unspecified Atrial Fibrillation	71	3%
Atrioventricular Block, Complete	54	3%	Atrioventricular Block, Second Degree	52	2%
Other	744	40%	Other	929	39%
Total	1,871	100%	Total	2,390	100%

	FY'18			FY'19Q1	
Top 10 Diagnosis	Count	%	Top 10 Diagnosis	Count	%
Persistent Atrial Fibrillation	630	21%	Persistent Atrial Fibrillation	187	23%
Paroxysmal Atrial Fibrillation	437	15%	Paroxysmal Atrial Fibrillation	134	16%
Supraventricular Tachycardia	152	5%	Supraventricular Tachycardia	39	5%
Sick Sinus Syndrome	133	4%	Unspecified Atrial Fibrillation	35	4%
Unspecified Atrial Fibrillation	102	3%	Sick Sinus Syndrome	34	4%
Typical Atrial Flutter	96	3%	Typical Atrial Flutter	30	4%
Ventricular Tachycardia	93	3%	Ventricular Tachycardia	22	3%
Atrioventricular Block, Complete	91	3%	Atrioventricular Block, Complete	21	3%
Syncope And Collapse	86	3%	Atypical Atrial Flutter	19	2%
Atypical Atrial Flutter	64	2%	Hypertensive Heart Disease With Heart Failure	18	2%
Other	1,096	37%	Other	286	35%
Total	2,980	100%	Total	825	100%

EMERGENCY DEPARTMENT DATA

Total MGH Emergency Department Patient Panel

	FY16		FY17		FY'18		FY'19Q1	
	Count	%	Count	%	Count	%	Count	%
MGH Total Unique Patients	76,503		75,504		76,401		22,344	
Gender								
Male	38,812	51%	38,329	51%	38,671	51%	11,252	50%
Female	37,683	49%	37,172	49%	37,727	49%	11,091	50%
Other/Unknown	8	0%	3	0%	3	0%	1	0%
Age								
0-17	9,401	12%	9,001	12%	9,490	12%	2,831	13%
18-64	50,735	66%	49,667	66%	49,579	65%	14,158	63%
65+	16,367	21%	16,836	22%	17,332	23%	5,355	24%
Race								
White	51,394	67%	50,442	67%	50,932	67%	14,879	67%
Black or African American	7,421	10%	7,458	10%	7,652	10%	2,346	10%
American Indian or Alaska Native	79	0%	90	0%	103	0%	33	0%
Asian	3,546	5%	3,744	5%	3,868	5%	1,071	5%
Native Hawaiian or Other Pacific Islander	49	0%	59	0%	55	0%	20	0%
Hispanic/Latino	1,163	2%	1,063	1%	1,017	1%	289	1%
Declined	794	1%	656	1%	586	1%	214	1%
Unavailable	2,167	3%	2,127	3%	2,179	3%	662	3%
Other/Unknown	9,890	13%	9,865	13%	10,009	13%	2,830	13%
Patient Origin								
HSA_1	491	1%	496	1%	529	1%	134	1%
HSA_2	1,408	2%	1,398	2%	1,423	2%	374	2%
HSA_3	3,279	4%	3,385	4%	3,284	4%	951	4%
HSA_4	46,678	61%	46,028	61%	46,997	62%	14,261	64%
HSA_5	4,898	6%	4,882	6%	4,682	6%	1,281	6%
HSA_6	11,267	15%	10,928	14%	11,319	15%	3,244	15%
Outside of MA	7,512	10%	7,439	10%	7,351	10%	1,890	8%
International	721	1%	848	1%	687	1%	180	1%
Unknown	249	0%	100	0%	129	0%	29	0%
MGH Total Visits	107,577		106,018		107,997		26,738	

ED Data

	FY'16	
Top 10 Diagnosis	Count	
Chest Pain, Unspecified	1,372	2%
Other Chest Pain	1,354	2%
Syncope And Collapse	1,319	2%
Headache	1,291	2%
Unspecified Abdominal Pain	1,014	1%
Urinary Tract Infection, Site Not Specified	982	1%
Dizziness And Giddiness	854	1%
Alcohol Abuse With Intoxication, Unspecified	818	1%
Low Back Pain	780	1%
Unspecified Injury Of Head, Initial Encounter	747	1%
Other	65,972	86%
Total	76,503	100%

	FY'17	
Top 10 Diagnosis	Count	
Other Chest Pain	1,696	2%
Headache	1,536	2%
Chest Pain, Unspecified	1,286	2%
Syncope And Collapse	1,271	2%
Low Back Pain	961	1%
Dizziness And Giddiness	960	1%
Urinary Tract Infection, Site Not Specified	886	1%
Alcohol Abuse With Intoxication, Unspecified	823	1%
Acute Upper Respiratory Infection, Unspecified	801	1%
Unspecified Abdominal Pain	781	1%
Other	64,503	85%
Total	75,504	100%

	FY'18	
Top 10 Diagnosis	Count	
Other Chest Pain	1,683	2%
Headache	1,510	2%
Chest Pain, Unspecified	1,286	2%
Syncope And Collapse	1,253	2%
Low Back Pain	945	1%
Dizziness And Giddiness	933	1%
Alcohol Abuse With Intoxication, Unspecified	843	1%
Acute Upper Respiratory Infection, Unspecified	808	1%
Urinary Tract Infection, Site Not Specified	764	1%
Unspecified Abdominal Pain	716	1%
Other	65,660	86%
Total	76,401	100%

	FY'19Q1	
Top 10 Diagnosis	Count	
Other Chest Pain	463	2%
Chest Pain, Unspecified	417	2%
Headache	378	2%
Syncope And Collapse	362	2%
Acute Upper Respiratory Infection, Unspecified	289	1%
Dizziness And Giddiness	269	1%
Low Back Pain	256	1%
Alcohol Abuse With Intoxication, Unspecified	229	1%
Suicidal Ideations	219	1%
Pneumonia, Unspecified Organism	195	1%
Other	19,267	86%
Total	22,344	100%

ENDOSCOPY DATA

Total MGH Endoscopy Patient Panel

	FY16		FY17		FY'18		FY'19Q1	
	Count	%	Count	%	Count	%	Count	%
MGH Total Unique Patients	*22,941*		*23,217*		*23,884*		*6,143*	
Gender								
Male	11,349	49%	11,250	48%	11,498	48%	2,932	48%
Female	11,589	51%	11,965	52%	12,384	52%	3,210	52%
Other/Unknown	3	0%	2	0%	2	0%	1	0%
Age								
0-17	1,283	6%	1,316	6%	1,317	6%	364	6%
18-64	13,978	61%	14,281	62%	14,637	61%	3,655	59%
65+	7,680	33%	7,620	33%	7,930	33%	2,124	35%
Race								
White	18,513	81%	18,651	80%	19,125	80%	4,951	81%
Black or African American	1,010	4%	1,110	5%	1,143	5%	273	4%
American Indian or Alaska Native	13	0%	23	0%	27	0%	7	0%
Asian	1,044	5%	1,015	4%	1,113	5%	283	5%
Native Hawaiian or Other Pacific Islander	11	0%	9	0%	10	0%	4	0%
Hispanic/Latino	223	1%	227	1%	227	1%	41	1%
Declined	306	1%	291	1%	320	1%	91	1%
Unavailable	485	2%	471	2%	400	2%	100	2%
Other/Unknown	1,336	6%	1,420	6%	1,519	6%	393	6%
Patient Origin								
HSA_1	239	1%	235	1%	234	1%	61	1%
HSA_2	660	3%	672	3%	684	3%	181	3%
HSA_3	1,443	6%	1,401	6%	1,414	6%	404	7%
HSA_4	12,980	57%	13,322	57%	13,810	58%	3,455	56%
HSA_5	2,089	9%	2,106	9%	2,139	9%	543	9%
HSA_6	3,258	14%	3,237	14%	3,290	14%	818	13%
Outside of MA	2,136	9%	2,135	9%	2,203	9%	649	11%
International	124	1%	103	0%	101	0%	30	0%
Unknown	12	0%	6	0%	9	0%	2	0%
MGH Total Visits	*29,139*		*29,496*		*27,073*		*6,471*	

Endo Data

	FY'16	
Top 10 Diagnosis	Count	
Encounter For Screening For Malignant Neoplasm Of Colon	4,793	21%
Benign Neoplasm Of Ascending Colon	1,028	4%
Benign Neoplasm Of Transverse Colon	874	4%
Benign Neoplasm Of Sigmoid Colon	758	3%
Gastro-Esophageal Reflux Disease Without Esophagitis	610	3%
Rectal Polyp	530	2%
Benign Neoplasm Of Cecum	507	2%
Melena	457	2%
Benign Neoplasm Of Descending Colon	434	2%
Dysphagia, Unspecified	418	2%
Other	12,532	55%
Total	22,941	100%

	FY'17	
Top 10 Diagnosis	Count	
Encounter For Screening For Malignant Neoplasm Of Colon	4,006	17%
Encounter For General Adult Medical Examination Without Abnorma	2,264	10%
Gastro-Esophageal Reflux Disease Without Esophagitis	769	3%
Benign Neoplasm Of Ascending Colon	467	2%
Epigastric Pain	440	2%
Hemorrhage Of Anus And Rectum	396	2%
Encounter For Screening, Unspecified	385	2%
Benign Neoplasm Of Transverse Colon	369	2%
Dysphagia, Unspecified	359	2%
Melena	347	1%
Other	13,415	58%
Total	23,217	100%

	FY'18	
Top 10 Diagnosis	Count	
Encounter For Screening For Malignant Neoplasm Of Colon	3,942	17%
Encounter For General Adult Medical Examination Without	3,145	13%
Gastro-Esophageal Reflux Disease Without Esophagitis	755	3%
Epigastric Pain	539	2%
Benign Neoplasm Of Colon, Unspecified	459	2%
Dysphagia, Unspecified	455	2%
Hemorrhage Of Anus And Rectum	434	2%
Benign Neoplasm Of Ascending Colon	378	2%
BarrettS Esophagus Without Dysplasia	326	1%
Personal History Of Colonic Polyps	301	1%
Other	13,150	55%
Total	23,884	100%

	FY'19Q1	
Top 10 Diagnosis	Count	
Encounter For Screening For Malignant Neoplasm	1,540	25%
Benign Neoplasm Of Transverse Colon	262	4%
Benign Neoplasm Of Ascending Colon	251	4%
Benign Neoplasm Of Sigmoid Colon	204	3%
Benign Neoplasm Of Descending Colon	153	2%
Other Diseases Of Stomach And Duodenum	136	2%
Benign Neoplasm Of Cecum	131	2%
Gastro-Esophageal Reflux Disease Without Esopha	129	2%
Diverticulosis Of Large Intestine Without Perforati	115	2%
Epigastric Pain	114	2%
Other	3,108	51%
Total	6,143	100%

MRI DATA

DON Number	Field (T)	System ID	Location	FY15 Volume	FY16 Volume	FY17 Volume
Main Campus MRI						
	1.5	617726MR4	55 Fruit Street Boston, MA	3833	3880	3973
	1.5	617726MR5	55 Fruit Street Boston, MA	3829	3858	4135
	3.0	400-511925	55 Fruit Street Boston, MA	4160	3839	2960
	1.5	400-188063	55 Fruit Street Boston, MA	3800	3580	4437
	1.5	617726ERMR	55 Fruit Street Boston, MA	8494	7588	9498
	3.0	617726MR1A2	55 Fruit Street Boston, MA	3727	3776	4926
	1.5	400-511924	55 Fruit Street Boston, MA	3064	3036	2499
	3.0	400-186756	55 Fruit Street Boston, MA	2564	2642	2701
	3.0	400-320729	55 Fruit Street Boston, MA	4167	4770	4327
	3.0	PJ1028	55 Fruit Street Boston, MA	166	137	121
Totals	**22.5**			37804	37106	39577

Attachment/Exhibit

3

Factor 4: Financial Feasibility and Reasonableness of Expenditures and Costs

Applicant has provided (as an attachment) a certification, by an independent certified public accountant (CPA) as to the availability of sufficient funds for capital and ongoing operating costs necessary to support the Proposed Project without negative impacts or consequences to the Applicant's existing Patient Panel.

F4.a.i **Capital Costs Chart:**
For each Functional Area document the square footage and costs for New Construction and/or Renovations.

		Present Square Footage		Square Footage Involved in Project				Resulting Square Footage		Total Cost		Cost/Square Footage	
				New Construction		Renovation							
Add/Del Rows	Functional Areas	Net	Gross	Net	Gross	Net	Gross	Net	Gross	New Construction	Renovation	New Construction	Renovation
	Electrophysiology Lab Project												
	Procedure	1,995	2,212	0	0	3,482	4,042	3,482	4,042	$0.00	$8,624,154.76	$0.00	$2,133.64
	Holding Bay	353	391	0	0	1,351	1,568	1,351	1,568	$0.00	$3,345,540.52	$0.00	$2,133.64
	Patient Support	692	767	0	0	858	996	858	996	$0.00	$2,125,101.44	$0.00	$2,133.64
	Clinical Support	232	257	0	0	1,746	2,027	1,746	2,027	$0.00	$4,324,878.28	$0.00	$2,133.64
	Staff Support	569	631	0	0	1,442	1,674	1,442	1,674	$0.00	$3,571,705.36	$0.00	$2,133.64
	Mechanical	702	779	0	0	834	968	834	968	$0.00	$2,065,359.52	$0.00	$2,133.64
	Circulation	858	952	0	0	2,527	2,933	2,527	2,933	$0.00	$6,257,952.12	$0.00	$2,133.64
	Subtotal Electrophysiology Lab	**5,401**	**5,989**	**0**	**0**	**12,240**	**14,208**	**12,240**	**14,208**	**$0.00**	**$30,314,692.00**	**$0.00**	**$2,133.64**
	Endoscopy Project												
	Endoscopy Procedure/Periop and Support	11,089	12,111	0	0	18,001	18,954	18,001	18,954	$0.00	$29,646,923.00	$0.00	$1,564.15
	Subtotal Endoscopy	**11,089**	**12,111**	**0**	**0**	**18,001**	**18,954**	**18,001**	**18,954**	**$0.00**	**$29,646,923.00**	**$0.00**	**$1,564.15**
	Emergency Department Project												
	Phase 1: Emergency Behavioral Health Expansion	1,806	1,900	0	0	6,894	7,053	6,894	7,053	$0.00	$7,168,975.32	$0.00	$1,016.44
	Phase 2: Renovate existing ED APS, CDU, FT	8,900	9,500	0	0	8,900	9,500	8,900	9,500	$0.00	$9,656,204.68	$0.00	$1,016.44
	Subtotal Emergency Department	**10,706**	**11,400**	**0**	**0**	**15,794**	**16,553**	**15,794**	**16,553**	**$0.00**	**$16,825,180.00**	**$0.00**	**$1,016.44**
	PET/MR Project												
	MRI/Equipment/Control Room Blake	0	0	0	0	943	1,038	943	1,038	$0.00	$3,445,355.54	$0.00	$3,319.22
	MRI Misc Support Blake	0	0	0	0	930	1,023	930	1,023	$0.00	$3,395,567.17	$0.00	$3,319.22
	Echo Reading Blake	0	0	0	0	324	357	324	357	$0.00	$1,184,963.29	$0.00	$3,319.22
	Subtotal PET/MR	**0**	**0**	**0**	**0**	**2,197**	**2,418**	**2,197**	**2,418**	**$0.00**	**$8,025,886.00**	**$0.00**	**$3,319.22**
	Miscellaneous Projects												
	PT/OT Clinical Space & Support	4,080	4,200	0	0	4,080	4,200	4,080	4,200	$0.00	$1,819,536.00	$0.00	$433.22
	Renovate MRI Changing Room	560	600	0	0	560	600	560	600	$0.00	$246,589.00	$0.00	$410.98
	Pharmacy Upgrade Hoods/Expansion	700	772	0	0	700	772	700	772	$0.00	$1,534,573.00	$0.00	$1,987.79
	Ellison 18 Renovation, Additional (1) Inpatient Bed	400	440	0	0	400	440	400	440	$0.00	$851,500.00	$0.00	$1,935.23
	CSPS Cart Washer and O2 Manifold	300	350	0	0	300	350	300	350	$0.00	$805,145.00	$0.00	$2,300.41
	Repair and Upgrade Inpatient Rooms	11,000	11,500	0	0	11,000	11,500	11,000	11,500	$0.00	$1,173,100.00	$0.00	$102.01
	Relocation and Build Out New Behavioral Health Clinic	7,000	7,350	0	0	7,000	7,350	7,000	7,350	$0.00	$5,111,645.00	$0.00	$695.46
	ADA Upgrades	5,500	5,833	0	0	5,500	5,833	5,500	5,833	$0.00	$350,000.00	$0.00	$60.00
	Blake 11 Psych Minor Renovation	2,250	2,500	0	0	2,250	2,500	2,250	2,500	$0.00	$1,929,699.00	$0.00	$771.88
	Wang 5 Outpatient GI Minor Renovation	18,000	19,000	0	0	18,000	19,000	18,000	19,000	$0.00	$2,275,644.00	$0.00	$119.77
	Total of All Projects (calculated):	**76,986**	**82,045**	**0**	**0**	**98,022**	**104,678**	**98,022**	**104,678**	**$0.00**	**$100,910,112.00**	**$0.00**	

Attachment/Exhibit

4

Attachment/Exhibit

A

Dear Heart and Vascular Centers PFAC Members,

Meeting Reminder...
Our next PFAC meeting is scheduled for March 6th in Trustees Board Room with dinner.

AGENDA

1. **5:30-6:15 PM**

- Reviewing changes and transitions in Outpatient Cardiology

Ami B. Bhatt, MD, FACC
Director, Cardiology Outpatient Services
Director, Adult Congenital Heart Disease Program

Sue McDermott, NP
Team Lead, Cardiology

2. **6:15-7 PM**

- Review of plans for new Electrophysiology Lab (EP)
- Looking for your input

Patrick Ellinor, MD PhD
Director, Cardiac Arrhythmia Service
Program in Medical and Population Genetics
The Broad Institute of Harvard and MIT

Conor Barrett, MD
Clinical Director, Cardiac Arrhythmia Service

Sharon McKenna, RN
Nurse Director, Cardiac Invasive Labs

William Cullen, MPA
Administrative Manager, Cardiac Arrhythmia Service

Please let me know if you are unable to make the meeting. We are looking forward to seeing you.

Heart and Vascular PFAC Meeting
March 6th, 2018

Topic/Presenter	Discussion and Follow up Action
Review of Plans for New Electrophysiology Lab (EP) Patrick Ellinor, MD, PhD; Conor Barrett, MD; Sharon McKenna, RN; and William Cullen, MPA Email Contact: PELLINOR@PARTNERS.ORG	Patrick Ellinor and his team presented on the new plans for the electrophysiology lab- expected start date October 2018. Reasons for new lab • Patient capacity has outgrown current lab • Equipment is outdated • Lack of patient privacy • Old equipment makes integration of new technologies challenging • Limited capacity for urgent procedures- causing increased wait times Committee members were in agreement with the need for a new lab- larger space and updated equipment. A new lab will allow MGH to provide top service, and continue growing with everchanging procedures and equipment. Additional recommendations from the PFAC committee: • The ability to leave the waiting area and be notified of changes. (Cell phone, text message, pager- similar to a restaurant) • Additional seating added to the area around the Blossom Café. • A clear separation between the waiting area and the admitting section. • TV use while in waiting room.

The next PFAC Meeting will be held on
June 5th. At 5:00pm, in the Trustee's Conference Room

To print any of the above slides, right click on slide icon, select Presentation Object, Open and Print

Attachment/Exhibit

B

HARVARD MEDICAL SCHOOL
TEACHING HOSPITAL

Cardiac Arrhythmia Service Proposal for a new Electrophysiology Laboratory

MASSACHUSETTS
GENERAL HOSPITAL

CORRIGAN MINEHAN
HEART CENTER

[redacted]

Patrick T. Ellinor, MD, PhD

Director, Cardiac Arrhythmia Service

Conor Barrett, MB, ChB

Clinical Director, Cardiac Arrhythmia Service

Sharon McKenna, RN

Nurse Director, Cardiac Electrophysiology Laboratory

William Cullen, MPA

Administrative Manager, Cardiac Arrhythmia Service

MASSACHUSETTS GENERAL HOSPITAL

CORRIGAN MINEHAN HEART CENTER

We have outgrown the current EP lab

Our patient population is expanding

- US population is aging
- Risk of AF increases with age
- Prevalence of AF is increasing

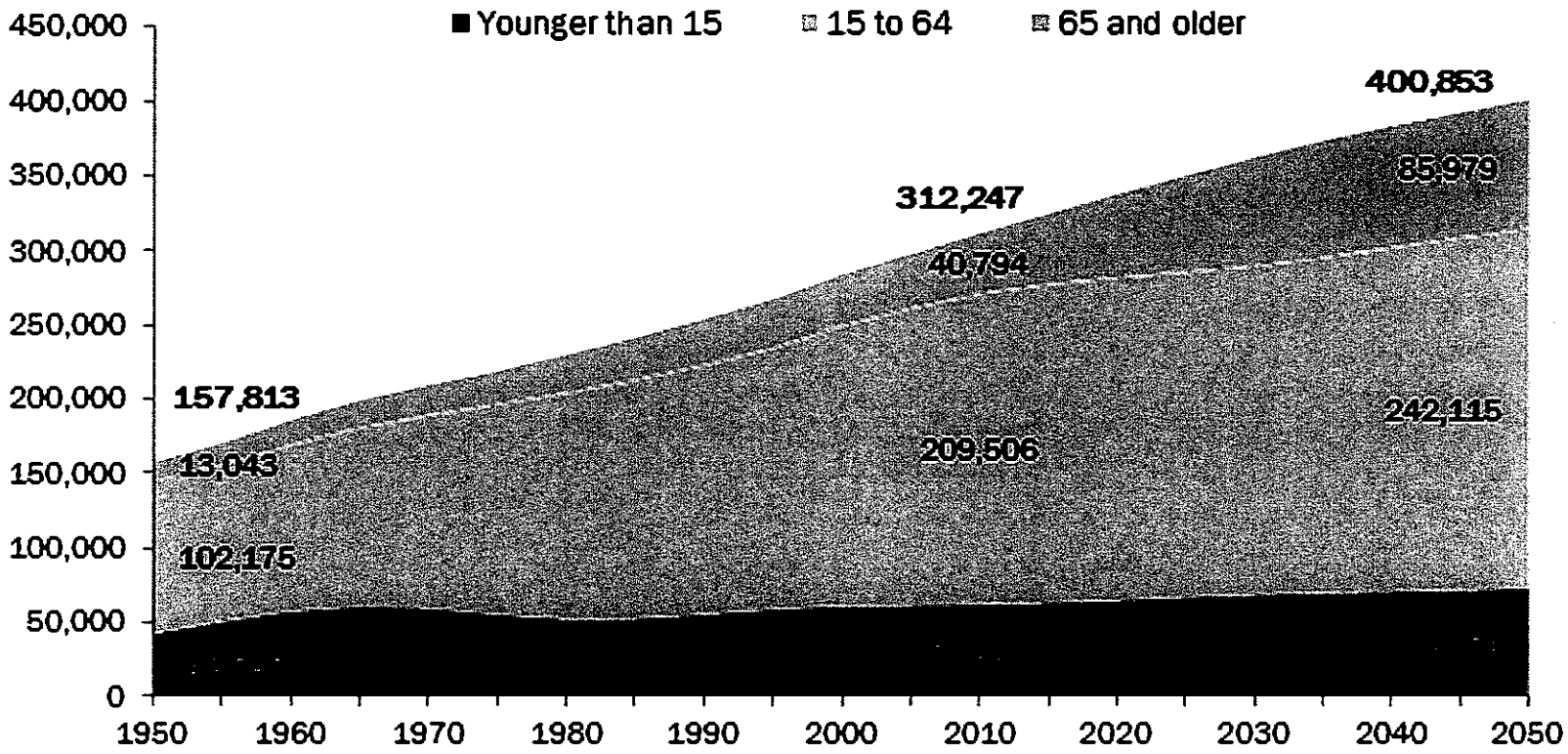
Net result is increased demand for treatment of AF and other arrhythmias

MASSACHUSETTS GENERAL HOSPITAL
CORRIGAN MINEHAN HEART CENTER

Larger and older US population

Estimates of the U.S. Population, by Age, 1950 to 2050

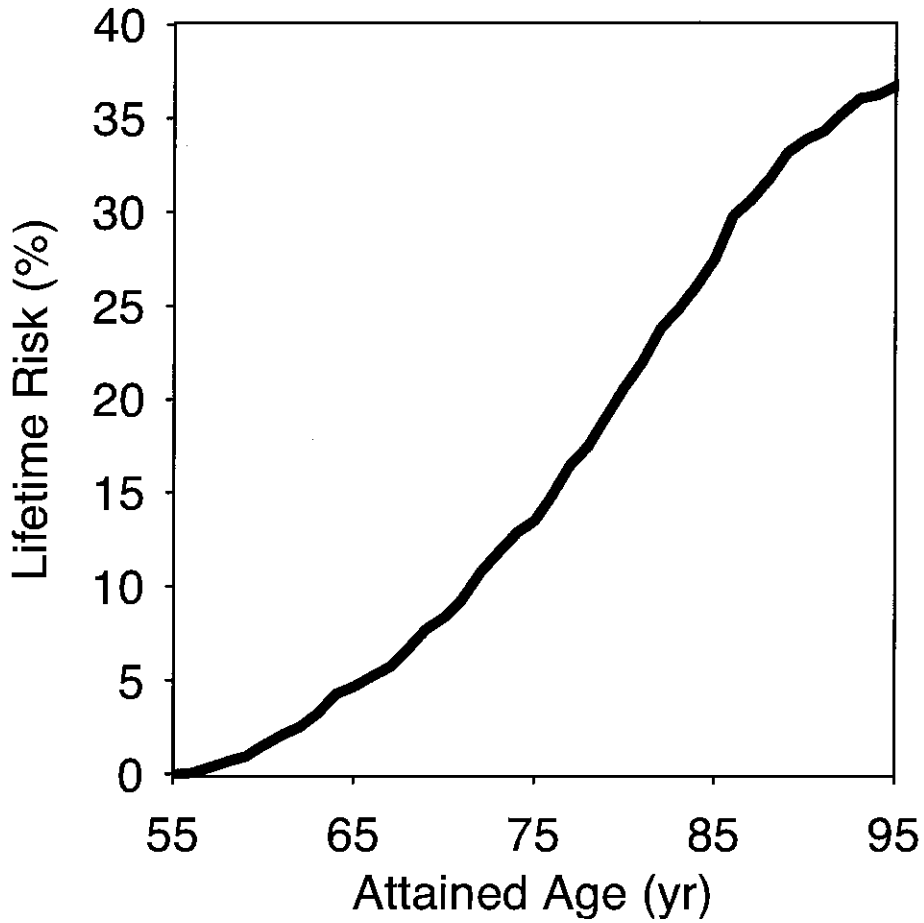
Thousands



Source: United Nations, Department of Economic and Social Affairs. *World Population Prospects: 2012 Revision*, June 2013, http://esa.un.org/unpd/wpp/index.htm

PEW RESEARCH CENTER

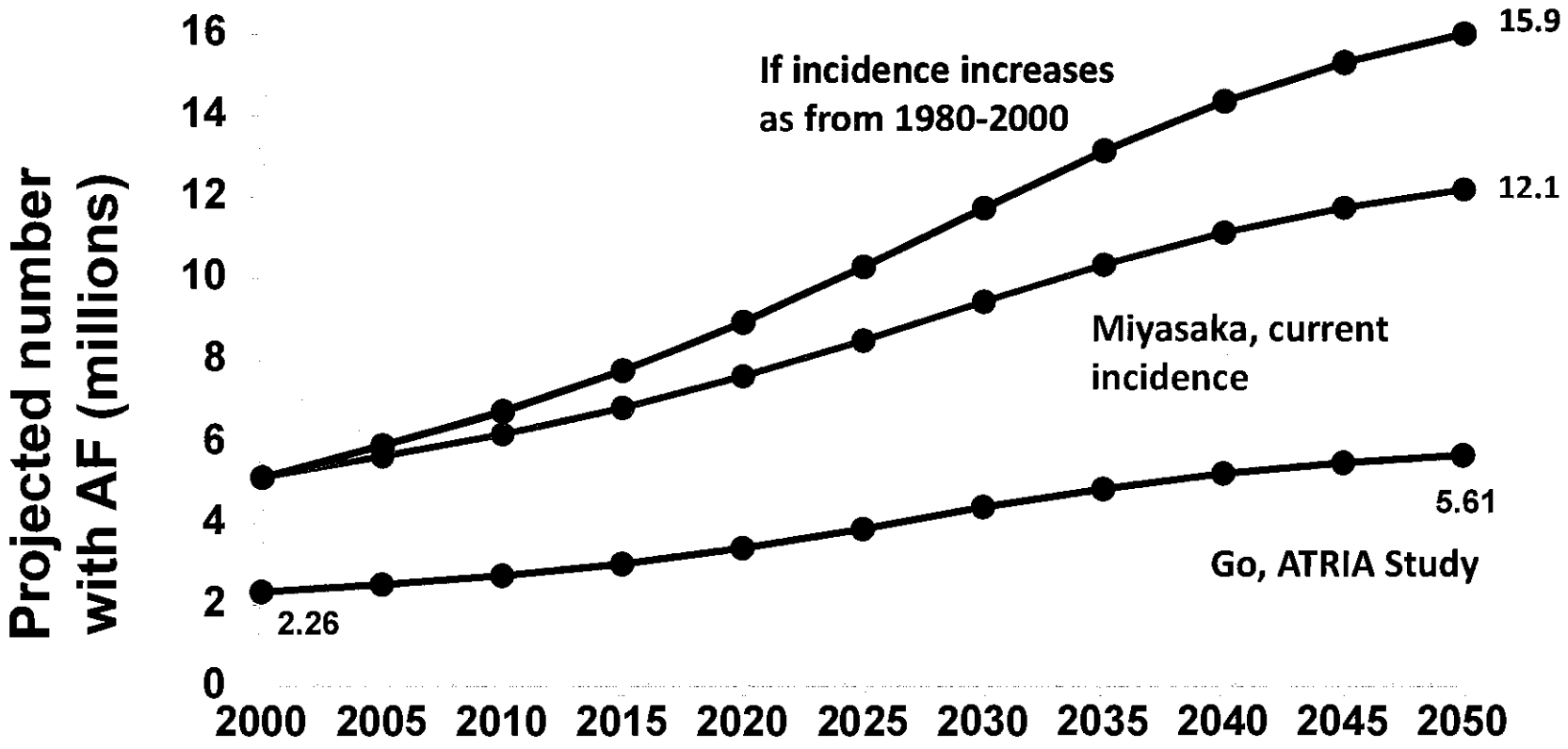
Lifetime risk of atrial fibrillation is high



Weng et al, *Circulation* 2018

MASSACHUSETTS GENERAL HOSPITAL
CORRIGAN MINEHAN HEART CENTER

Increasing prevalence of AF



Miyasaka *Circulation* 2006;11:119; Go *JAMA* 2001;285:2370

MASSACHUSETTS GENERAL HOSPITAL
CORRIGAN MINEHAN HEART CENTER

We have outgrown the current EP lab

Our patient experience should be a better reflection of MGH

- Limited recovery space
- Lacks privacy
- Cluttered

We have outgrown the current EP lab

Our staff is terrific and has done amazing work, but the facilities are increasingly challenging

MASSACHUSETTS GENERAL HOSPITAL
CORRIGAN MINEHAN HEART CENTER

We have outgrown the current EP lab

EP is a field of innovation and technology

Our goal at MGH is to lead the development of new therapies

Attachment/Exhibit

C

nbbj

AGENDA

MGH Cambridge Street Project – Early Phase

Subject: Experience Design Workshop #1

Date: February 11, 2019, 2:00 pm – 6:00 pm

Meeting Purpose: The purpose of this meeting was to build a vision for the ideal MGH experience from patients and family members by conducting interactive activities and reviewing projects "on the boards".

Agenda

- Introduction & Agenda
- Cambridge Street Project overview
- Experience Design Process overview
- Presentation of Patient/Family Needs
- Activity #1: Experience Mad Lib
- Break
- Activity #2: How Might We...
- Break
- Activity #3: Storyboarding
- Behavioral Health ED Remodel – Project Review
- Digestive Health Remodel – Project Review

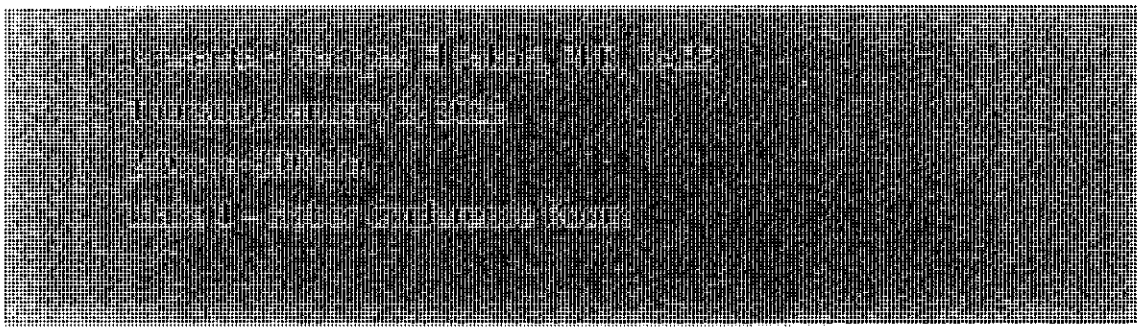
MGH
Experience Design Workshop 1
11-Feb-19
Attendee List

Initials	Attendee
x	Ann Buckley
x	Beth Souza
x	Bill Kieffer
x	Bob Seger
x	Cindy Sprogis
x	David Wooster
x	Erika Rosato
x	Jay Petri
x	Joey Buizon
x	Judy Silva
x	Kathy Martin
x	Leslie Waisnor
x	Mara Bloom
x	Matt Reid
x	Paul Smith
x	Peter Zschokke
x	Robin Lipkis-Orlando
x	Steve Herskovitz
x	Stuart Murphy
x	Teri Fryer
x	Tom Fryer
x	Zach Martin
x	Ralph F. Verni
x	Mary Fran Hughes
x	Diane Clary

Attachment/Exhibit

D

The Need for and Benefits of PET/MR at Massachusetts General Hospital



MASSACHUSETTS GENERAL HOSPITAL

Agenda

- Background Information on the Department of Radiology
- About PET/MR Services
- Benefits of PET/MR Services
- Proposed PET/MR Project

MGH Department of Radiology

- The Massachusetts General Hospital Department of Radiology provides comprehensive diagnostic imaging and interventional services, trains the next generation of subspecialty radiologists, and carries out research that advances the state of the art in medical imaging. We provide expert insight on using medical imaging to answer clinical questions and guide critical decisions.

- The Department of Radiology employs more than 100 board-certified radiologists specializing in 12 clinical areas supported by hundreds of highly trained technologists and support staff. Over 500 researchers are pioneering advances in medical imaging, and close to 100 trainees are studying to become the next generation of subspecialized radiologists.

Need for PET/MR Services

- As the population in the 65+ age cohort continues to rapidly grow within the Commonwealth, the incidence of certain conditions are also increasing, such as oncologic, cardiovascular, pediatric, and neurologic conditions. PET/MR has proven to be a vital tool in obtaining the necessary data to diagnose, stage and treat specific conditions within these sub-specialties. Consequently, MGH is seeking to obtain a PET/MRI unit for part-time clinical Use. Ensuring that appropriate patients have access to this modality.
- Since its approved use in the United States in 2011, PET/MR has been particularly helpful in oncologic, cardiovascular, pediatric, and neurologic imaging. PET/MR is particularly well-suited for precision medicine for several reasons: the ability to concurrently obtain a broad range of quantitative images, the simultaneous image acquisition of two unique modalities, and the acquisition of combined modalities without increased radiation.

Need for PET / MR (2)

Among U.S. News and World Report's Top 20 institutions, twelve are currently performing clinical PET/MR, with others now gearing up to perform clinical scans

2017-18 U.S. News & World Report Rank	Institution	Performing clinical PET/MR?	Scanner	Approximate date of inception
1	Mayo Clinic, Rochester, MN	Yes	GE	2015
2	Cleveland Clinic, Cleveland, OH	Yes	Siemens	2013
3	Johns Hopkins Hospital, Baltimore, MD	No	--	--
4	Massachusetts General Hospital, Boston, MA	No		--
5	UCSF Medical Center, San Francisco, CA	Yes	GE	2014
6	University of Michigan Hospitals and Health Centers, Ann Arbor, MI	No	--	--
7	Ronald Reagan UCLA Medical Center, Los Angeles, CA	No	--	--
8	New York-Presbyterian Hospital, NY (Cornell)	Yes	Siemens	2014
9	Stanford Health Care-Stanford Hospital, Stanford, CA	Yes	GE	2014
10	Hospitals of the University of Pennsylvania-Penn Presbyterian, Philadelphia, PA	No (available soon)	GE	2016
11	Cedars-Sinai Medical Center, Los Angeles, CA	Yes	Siemens	2013
12	Barnes-Jewish Hospital, St. Louis (MIR/Wash U), MO	Yes	Siemens	2011
13	Northwestern Memorial Hospital, Chicago, IL	Yes	Siemens	2017
14	UPMC Presbyterian Shadyside, Pittsburgh, PA	Yes	Siemens	2017
15	University of Colorado Hospital, Aurora, CO	No	--	--
16	Thomas Jefferson University Hospitals, PA	Yes	Siemens	2016
17	Duke University Hospital, Durham, NC	No	--	--
18	Mount Sinai Hospital, NY	Yes	Siemens	2011
19	NYU Langone Medical Center, NY	Yes	Siemens	2012
20	Mayo Clinic Phoenix, AZ	No	--	--

- **PET/MR capacity – critical** for MGH to have clinical PET/MR capacity, as PET/MR technology has become widely adopted across the country and world. Will also serve as a **major catalyst** to further patient care, technology development, research and educational objective.
- **Much needed MR imaging capacity** – the scanner would provide much needed MR imaging, to be performed in the evenings and weekends to help meet MR imaging demands.
- **Closing the gap on cardiac imaging** – MGH lags behind other leading institutions that have developed robust cardiac imaging programs. The proposed PET/MR scanner will help close this gap.

What is PET/MR

- PET and MRI are two well-established imaging systems that have been available for clinical use for over three decades. PET/MR is a recent combination imaging technique that merges the quantitative physiologic and metabolic information provided by stand-alone PET with the complementary anatomic and functional information provided by stand-alone MRI.

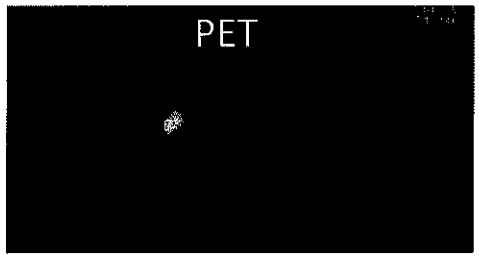
- PET/MR is preferred over PET/CT in certain clinical settings as the unique features of the MRI allow for more comprehensive imaging evaluation. MRI provides anatomical information with improved soft-tissue contrast and can visualize specific tissues and pathology using imaging sequences that are not available with CT. PET/MR units acquire data simultaneously, slice by slice, providing excellent image registration and improved fine anatomic detail. Additionally, the radiation dose from PET/MR is significantly lower than from PET/CT, making PET/MR a preferred imaging modality, especially among those patients in need of continued scans, as well as children.

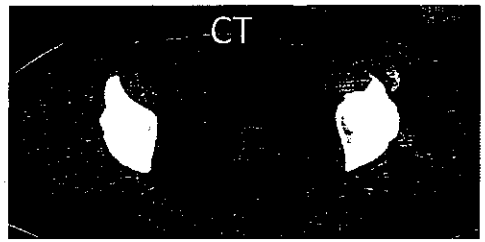
Benefits of PET/MR

- Some of the benefits of PET/MR include:
  - "Combined PET/MR scanners acquire PET and MR data simultaneously, allowing for accurate temporal and spatial matching of PET and MR data.
  - MR has better soft-tissue contrast than CT and can acquire functional data with, for example, diffusion-weighted imaging ("DWI").
  - In a study that compared PET/CT and PET/MR, PET/CT was found to be superior in detecting lung nodules, but PET/MR revealed additional findings not seen on PET/CT in 41% of oncology patients.
  - The radiation dose from PET/MR is substantially less than PET/CT.
  - PET/MR appears to be particularly helpful in evaluating lesions in lymph nodes, liver, bone, pelvic organs, and breast tissue." For these reasons, the Applicant's and MGH's patient panels will benefit from converting this unit to part-time clinical use.

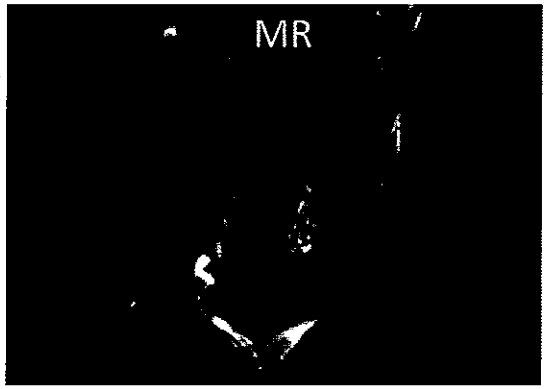
Metastatic Disease

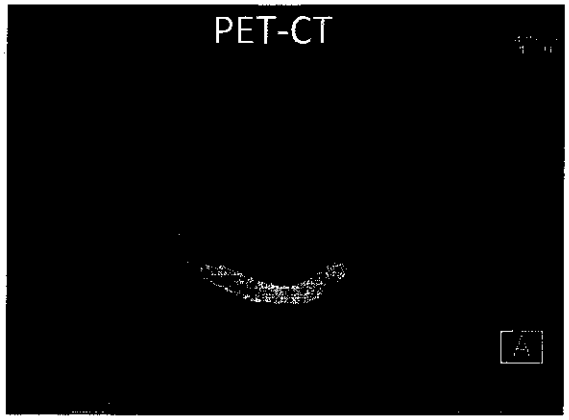
^{18}F-FDG – 45 y.o. female with melanoma of right thigh

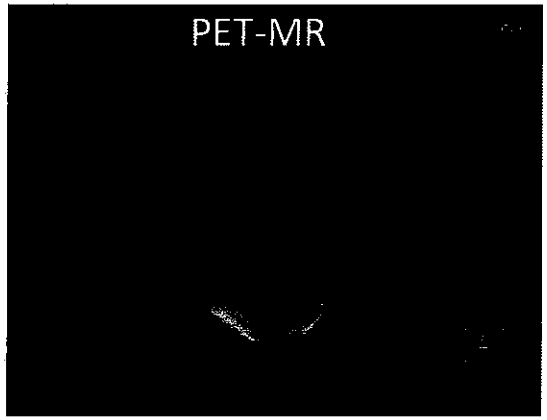




→ Ovary → Metastasis

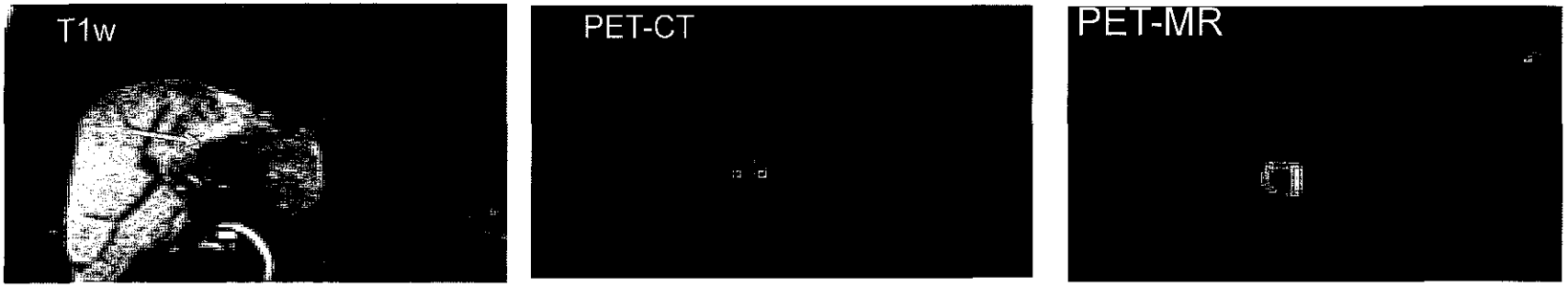




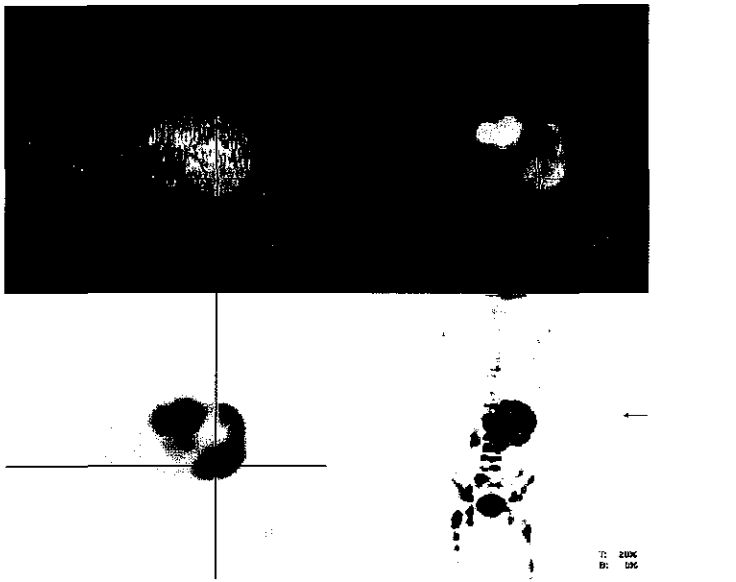


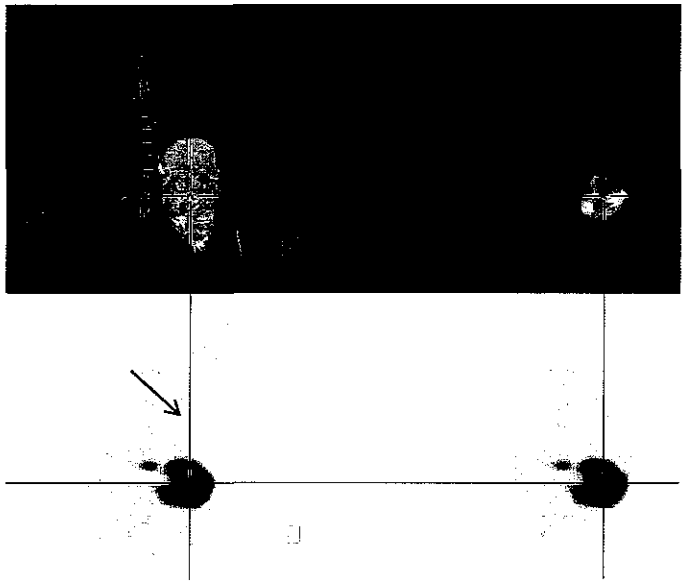
Right ovary in ovulatory phase versus lymph node metastasis?
(co-registered and fused PET and MRI)

Hepatic Cancer Study



Neuroblastoma (pediatrics)





Whole-Body STIR MRI & ^{18}F-FDG PET
Extensive bone marrow metastasis on PET

Attachment/Exhibit

5

Attachment/Exhibit

A

Community Health Needs Assessment & Implementation Strategy

October, 2015

Massachusetts General Hospital
Prepared by the Center for Community Health Improvement

Table of Contents

Executive Summary

MGH is committed to engaging in deep and transformative relationships with local communities to address the social determinants of health and increase access to high-quality health care. The MGH Center for Community Health Improvement (CCHI) conducted its first community health needs assessments (CHNA) in 1995 and has done so periodically in Revere, Chelsea and Charlestown, where MGH has had health centers for more than 40 years. As a result of these assessments conducted in partnership with local communities, we have made substantial progress on preventing and reducing substance use disorders, improving access to care for vulnerable populations, expanding opportunities for youth and more.

2015 Community Health Needs Assessment

2015 Community Involvement

1737 Quality of Life Surveys returned

123 individuals reached through 12 focus groups

More than 100 people attended community meetings

The 2015 CHNA is the second assessment since the Patient Protection and Affordable Care Act of 2010 required hospitals to conduct CHNA's every three years. The guidelines require diverse community participation to identify health priorities and develop strategic implementation plans. In the 2012 assessment, CCHI used a planning process called MAPP, Mobilizing for Action through Planning and Partnerships. This intensive process included several phases with extensive community outreach and engagement and primary data collection. The work of the community assessment committees in 2012 provided the strong foundation for 2015.

The 2015 CHNA included engaging new and existing community partners who collected and reviewed primary and secondary data. More than 2,000 people participated in this process. The goals of the 2015 CCHI CHNA were to:

1) Identify the health needs, assets and forces of change in Revere, Chelsea and Charlestown
2) Engage community members through the process
3) Gauge the communities' progress on addressing the 2012 CHNA priorities
4) Determine 2015 priorities and implementation strategy

Priorities & Strategies

Substance use and **public safety/crime and violence** remain the top two health issues for our communities, with 80% of survey respondents choosing substance use as their top health concern, up from 70% in 2012. **Obesity/poor diet and inactivity** continue to be important community priorities followed closely by **mental health** as an emerging health concern. **Education, the environment and housing**, all of which are social determinants of health, are also of concern for many residents. Many of these issues will be CCHI's priorities for the next few years.

To address these health issues, we will strengthen and focus our community coalition strategies to prevent and reduce substance use, improve healthy eating and active living and reduce the effects of trauma and violence. We will work to screen patients for food and housing insecurity and strengthen our community health worker model to improve access to care and help those most in need. Finally, we will broaden the horizons of and promote educational attainment for youth through strengthening and expanding our Science, Technology, Engineering, and Math (STEM) programs.

MGH: A Tradition of Caring

Massachusetts General Hospital (MGH) has a long legacy of caring for the underserved in the local community. Founded in 1811 to care for the "sick poor," today that commitment is demonstrated through caring for all regardless of ability to pay, supporting three community health centers for more than 40 years and a comprehensive approach to addressing social determinants of health. MGH Trustees affirmed this commitment in 2007 by expanding the hospital's mission to include "...improve the health and well-being of the diverse communities we serve."

MGH recognizes that access to high-quality health care is necessary, but by no means sufficient to improving health status. We must also engage in deep and transformative relationships with local communities to address the social determinants of health. Thus, MGH created the Center for Community Health Improvement (CCHI) in 1995, with the mission of collaborating with communities to achieve measurable, sustainable improvements to key indicators of the community's health and well-being. Since 1995 MGH has partnered with the low-income neighboring communities of Revere, Chelsea and Charlestown to identify and make measurable improvements in health. We have done this by routinely conducting health needs assessments in these communities. We convene leaders of local government, public health, schools, police, community-based nonprofits, faith-based organizations, community development corporations, and community residents. Today, our work is focused on addressing social determinants of health along the Health Impact Pyramid developed by the U.S. Centers for Disease Control & Prevention, using the following three approaches.

- ***Building and Sustaining Multi-Sector Coalitions to Change Policies and Systems***
- ***STEM: Developing the Assets of Youth***
- ***Addressing Social Determinants/Improving Access to Care for Vulnerable Populations***

Our investment in this work runs deep. MGH invests more than $15 million in community programs, not accounting for the new substance use disorder initiative (annualized at about $2 million) or the contributions of clinical departments. In total and according to the Massachusetts Attorney General's definition, MGH's investment in community benefits is 5.4% of patient care related expenses. An additional $2 million in grants and gifts is also raised to supplement, never supplant, our ongoing investment to the community. The investment of MGH has leveraged millions in federal and state grants into communities; police, schools, fire departments, housing authorities, mental health providers and others have all received grants as a result of their engagement in the community coalitions. The work is designed to build community capacity and leadership and to change policies and systems, all of which lead to sustainability.

Progress to Date on 2012 CHNA Implementation Plan

Community Initiatives

CCHI is the "backbone organization" using a "collective impact" (*Stanford Social Innovation Review*) framework for four multi-sector coalitions that seek to prevent and reduce substance use and obesity. This means we act as convener and provide staff, best practices, evaluation support and access to a range of additional resources. As example, our Revere CARES Coalition, founded in 1997, has engaged city leaders, police, schools, parents, health and human service providers,

youth, and many more in advocating for policies and systems that build protective factors and reduce risk factors for unhealthy behaviors, including substance use and healthy eating/active living. Similar approaches are used by the Charlestown Substance Abuse Coalition and the Healthy Chelsea Coalition which employ multiple strategies in multiple domains to change social norms and attitudes.

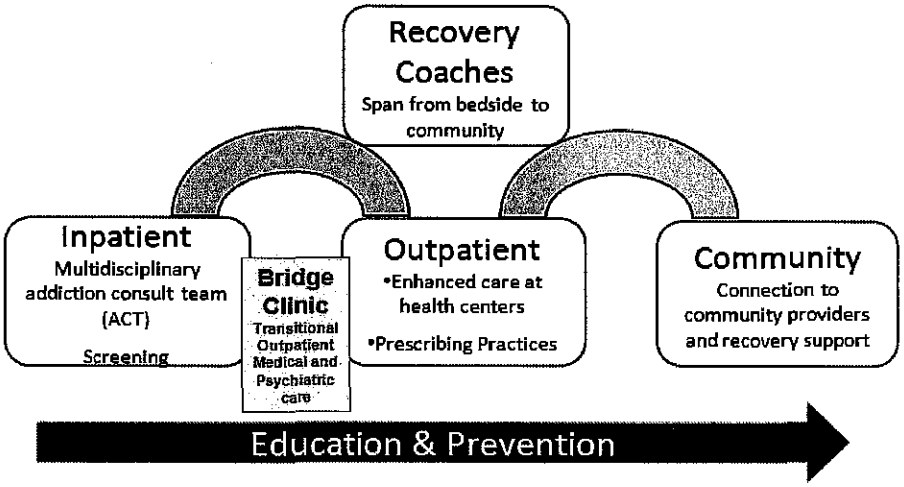
Among the coalitions accomplishments are: after-school programs to provide positive alternative activities; successful advocacy before the liquor licensing commission to limit licenses; social marketing campaigns and parent pledge drive (the Power of KNOW – Know where your kids are going, with whom, when they will be home, etc); successfully advocating for artificial trans fat bans, walking and bike trails, community gardens, farmers' markets, Complete Streets, Safe Routes to Schools and more.

As a result of the 2012 assessment, the MGH leveraged this approach to collaborate with new community partners and individuals to address the priorities identified in each community. Some of the new collaborations that were promoted and developed include:

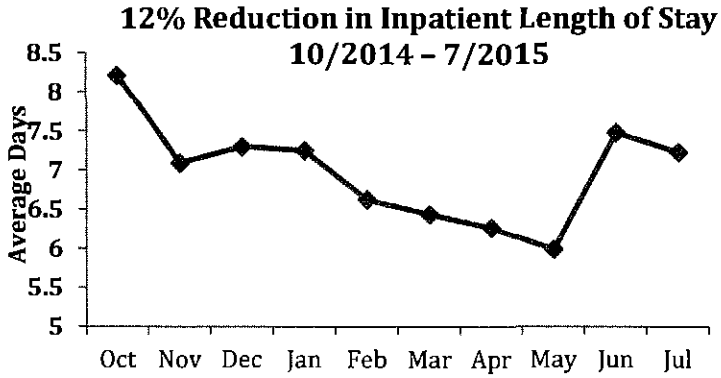
- A "Family Support Circle" to provide support to families and enhance communication and collaboration among Charlestown providers;
- CAPE/CHANGE, a partnership with Whole Foods of Charlestown; Kids Cooking Green; the Kennedy Center, the local anti-poverty agency; and the Charlestown YMCA to promote and improve health, fitness and quality of life and to reduce chronic disease risk through the consumption of healthy diets and daily physical activity;
- Boston Housing Authority Charlestown Adult Education (CAEP), Mishawum & CharlesNewtown Housing, Smart from the Start and the Charlestown Substance Abuse Coalition partnered to develop a culture of life-long learning by providing high quality high school equivalency preparation and ESOL classes and by facilitating college and career readiness skills. In 2015, 19 of 25 students in the FastTrack class passed their HiSET exams, and eight students obtained employment;
- Chelsea Leadership Team formed to respond to substance use disorders and worked to improve public safety through neighborhood revitalization, increasing access to care and education. The team engaged in neighborhood revitalization efforts to improve public safety, and provided education to the community through Narcan trainings and distribution.
- Revere's Healthy Relationships Task Force formed to address individual and family violence identified in the assessment. The task force worked with Revere Youth in Action and released a comprehensive report on status and needs in Revere regarding out-of-school activities.

Hospital Initiative

Since all communities identified substance use, including opioids, prescription drugs and heroin, as their number one issue, CCHI redoubled its community-based prevention efforts and **MGH launched a new clinical initiative on substance use disorders (SUDS)**. This initiative became the leading clinical priority in the most recent hospital strategic plan, the first time MGH's clinical priorities were community driven. This comprehensive new initiative was developed jointly by the Population Health Management and Community Health strategic planning committees, to transform the design of clinical care for patients with substance use disorders. The plan's goal is to advance care from treatment of the acute medical complications of substance use to management of the chronic disease of addiction, in much the same way that other chronic conditions like diabetes and hypertension are managed. This model includes recovery coaches, a specialized inpatient consultation team, outpatient services and connection to community supports. This change in the system of care marks the first time that MGH is addressing an issue along all levels of the Health Impact Pyramid--from primary community-based prevention, to early intervention and treatment, to chronic disease management. This was a milestone in integrating community health and clinical care. As we improve community health, MGH is working to transform hospital culture.



Preliminary findings of this initiative are promising. Since October, 2014, there has been a 12% reduction in average length of stay for patients receiving a consult.



Community Health Needs Assessment

Objectives

In 2015, CCHI planned and implemented a community health needs assessment (CHNA) in the cities of Revere and Chelsea and the Boston neighborhood of Charlestown using a participatory, collaborative approach. Assessing a community's health needs is an important step in helping communities mobilize to address health issues. CCHI conducted its first CHNA in these communities in 1995, which established the foundation of its work. CCHI has long-standing commitments to address complex health problems identified through community health data.

The goals of the 2015 CCHI CHNA were to:

1. Identify the health needs, assets and forces of change in Revere, Chelsea and Charlestown
2. Engage community members through the process
3. Gauge the communities progress on addressing the 2012 CHNA priorities
4. Determine 2015 priorities and implementation strategy

Target Population

In line with our community commitments and per the IRS Community Health Needs Assessment regulation, MGH addresses the health needs of the area's most underserved populations.

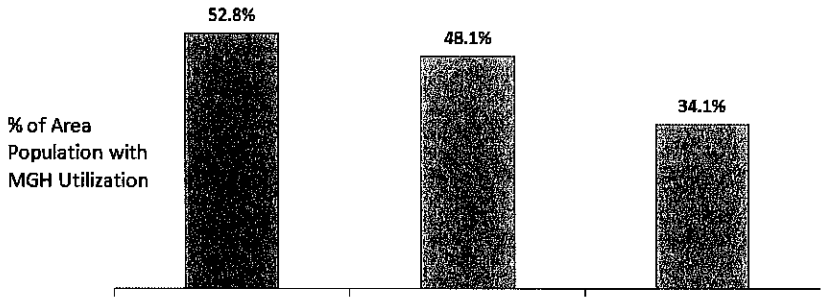
Population Characteristics

	Chelsea	Revere	Charlestown	Massachusetts
Population	36,168 62% Hispanic	52,588 25% Hispanic	17,454 7.7% Hispanic	6.6 mil. 9.6% Hispanic
Per Capita Income	$19,246	$24,873	$54,971	$35,763
Children living below 100% poverty	33.7%	22.5%	46%	14.9%
Those living below 100% poverty	23.7%	25.4%	19%	11.4%
High School Graduation Rate	58%	77%	66%	84%
Percent Population Age 5+ with Limited English Proficiency	53%	22.6%	11.5%	8.9%
Foreign born	48%	31%	17%	15%

Data Source: 2010 US Census Bureau, US Department of Education EdFacts

The focus on the communities of Revere, Chelsea and Charlestown aligns with the established MGH health centers located in each of these communities, which provide comprehensive primary and specialty care to more than 63,000 primarily low-income individuals and families annually. These patients make up much of MGH's most vulnerable populations that include non-English speaking residents and low-income families.

Percent of Community with FY14 MGH Utilization



Area (Census 2010 Pop.)	Charlestown (16,439)	Chelsea (35,177)	Revere (51,741)
# Patients from Area Zip Code	8,688	16,903	17,636
% Pedi Pts	21.8%	37.2%	25.7%
% of All MGH Pts	2.2%	4.3%	4.5%

Data Source: Denominators based on Census 2010 population counts and MGH utilization based on EPSi inpatient and outpatient data for FY14.

The primary barriers to care for the region are language, health insurance status, and poverty. The region has had rapidly changing shifts in population with the influx of non-English speaking individuals and families, which has challenged the health systems capacity to serve patients.

Assessment Process

The 2015 CHNA was the second assessment process conducted since the Patient Protection and Affordable Care Act began requiring hospitals to conduct CHNA's every three years. The guidelines require diverse community participation with the goal of identifying health priorities and developing strategic implementation plans. In 2012, CCHI successfully conducted the CHNA using MAPP, Mobilizing for Action through Planning and Partnerships, an assessment and strategic planning process. It was an intensive 10-month process that included several phases with extensive community outreach and engagement and primary data collection. The work of the community assessment committees in the 2012 CHNA provided the strong foundation of community engagement for future assessments and participation in CCHI's community coalitions.

The 2015 CHNA included engaging new and existing community partners and committee members through two community assessment meetings in each community. The committee meetings were well attended, and considerable effort was made to re-engage 2012 participants and outreach to new community partners. More than 100 individuals participated across the six meetings in the three communities. Committee members represented multiple sectors in the community, such as local government, police, schools, religious organizations, volunteer organizations and social service agencies. Approximately 30 individuals were present at each meeting to provide input and interpretation of data.

Primary data collection consisted of the administration of the Quality of Life survey, a tool within MAPP, focus groups targeting populations less likely to respond to surveys, and a review of available public health and hospital data. See the timeline below describing the community engagement and data collection periods. The following sections describe the CHNA process in more detail.

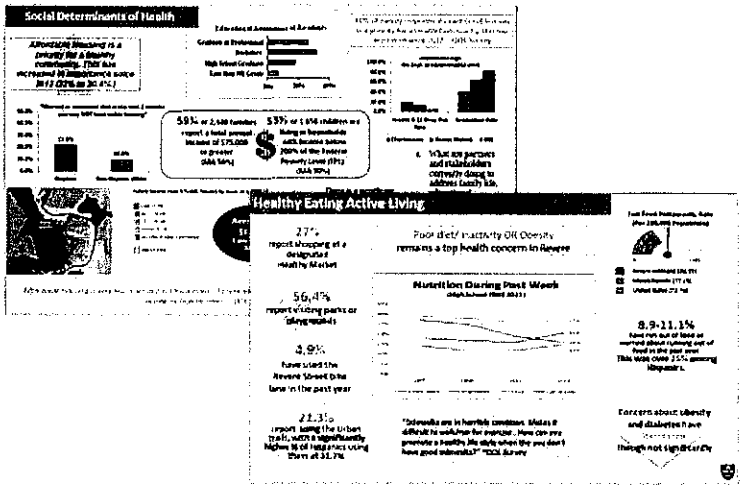
2015 CHNA Timetable (All Communities) Activity	Months
Re-engaged assessment committee members and recruited new members	Nov – Dec. 2015
Convened Assessment Meeting 1	January 2015
Quality of Life Survey Distributed	Feb - April 2015
Quality of Life Survey Analyzed	May - June 2015
Focus Groups Conducted	May - June 2015
Focus Group Data Analyzed	July 2015
Public Health Data Updated	Jan - June 2015
Convened Assessment Meeting 2	July - Aug 2015
Committees/Coalitions Work Plan Development	July - Oct 2015
MGH Board of Trustees Reviews & Approves CHNA and Hospital Response	September 18, 2015

CCHI employed a strong community participatory approach, consistent with past community assessments and the Center's guiding principles. Community assessment meetings were convened with the support of CCHI's local community coalitions and community partners. At the first of two assessment meetings, the group reviewed the 2012 CHNA process and progress made by the community, and provided extensive input on the methods for the 2015 CHNA. For example, the community assessment committees determined the distribution plan for the Quality of Life survey and identified the groups/populations to participate in the focus groups.

CCHI analyzed all of the data and presented this at the second assessment committee meeting. Participants identified priorities and discussed how or if they were addressed, what additional resources, if any, were needed, and recommended strategies for the future. The MGH Board of Trustees approved the CHNA on September 18, 2015. An overview of methodology used for this assessment is below. For more detailed information, including samples of the tools used and analysis, please contact CCHI at cchieval@partners.org.

Methodology

1. **Community Assessment Committee Participation/Contribution**: As described above, the community assessment committees guided the assessment process. During two meetings in each community, they provided important guidance on assessment methods and first hand data on community conditions, assets and the forces of change that affect health. The committee members provided important data interpretation by reviewing the data in round-table groups using community-specific data "placemats" *(see exhibit).* Data placemats are a tool to communicate with stakeholders the key data themes and engage them in data interpretation (Pankaj, Veena. (October 2014). "Data Placemats: A DataViz Technique to Improve Stakeholder Understanding of Evaluation Results." Paper presented at the American Evaluation Association Annual Conference, Denver, CO).



2. **Quality of Life Survey**: The anonymous survey assessed community perceptions of quality of life, health problems in the community, safety, community changes and demographic information (including perceptions of personal health, food and housing stability, gambling activity, and utilization of select local resources). The survey was translated into Spanish, Arabic, and Cantonese, and was distributed widely via the web and in-person within each community. A total of 2,015 individuals across Revere Chelsea, and Charlestown responded to the survey. After cleaning the data, an average of 86% of the responses were useable, yielding 1,737surveys.
3. **Focus Groups**: Twelve focus groups engaged individuals underrepresented in the survey response. The groups were co-facilitated by CCHI evaluators and local coalition staff. There were a total of 123 participants (42 in Charlestown, 54 in Revere, 27 in Chelsea) who participated in a one-hour session and received $20 gift card as compensation for their time. Focus groups were conducted in English, Spanish and Arabic (with the help of an interpreter).
4. **Public Health Data**: Public health data were gathered from the U.S. Census, MA Department of Education, Boston Public Health Commission, MA Department of Public Health, local police departments and community-based organizations.
5. **MGH Patient Data**: Aggregate patient data was pulled by zip code and analyzed to better understand the needs of patients who live in Revere, Chelsea and Charlestown. Once the community health priorities were identified from other data sources, data were reviewed to determine the prevalence of these health issues within MGH's patient population. This analysis confirmed that community perception was consistent with disease prevalence in the health center's patient population.

Limitations

As with all field research, there are several data limitations to report. This assessment sought to obtain diverse participation in the community. Every effort was made to ensure broad distribution of the Quality of Life survey so that all groups in the community were well represented. The majority of survey respondents were white females despite this community outreach. However, there was a sufficient sample within each community to allow for analysis by sub-groups (e.g. male vs. female, Hispanic/Latino). Focus groups were conducted in the communities to obtain the perspectives of youth, parents and non-English speakers. Lastly, the data shared on the data placemats with the community assessment committee consisted of preliminary data organized by common themes determined by the CCHI evaluation and research team. The data placemats were used to generate discussion, which furthered the understanding of the conditions in the community. Finally, availability of data for Charlestown, which is a neighborhood of the City of Boston, is different than that for Revere and Chelsea which are independent municipalities.

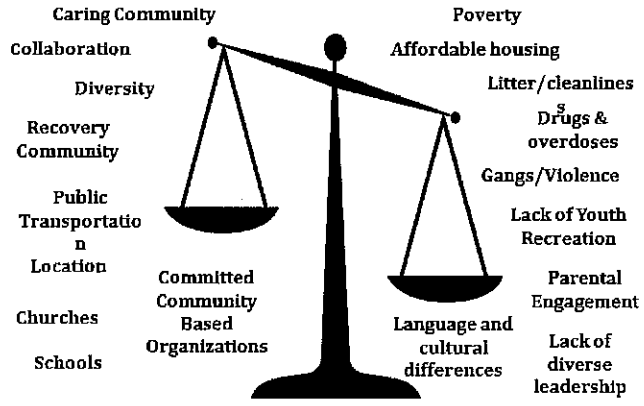
Key Findings

Community Assets, Challenges, Forces of Change & Perceptions of Health

In meetings and focus groups, communities discussed their strengths and assets, challenges, forces of change that affect public health (also called threats and opportunities) and defined the characteristics of a healthy community. In addition, community member perceptions of their community's health - current and future - also were assessed through discussion and the Quality of Life Survey. This information was important to consider in developing a common vision with committee members and in identifying obstacles or positive forces in the community and region that might impact change. This information was gathered primarily through guided discussions during community assessment committee meetings.

Community Assets & Challenges

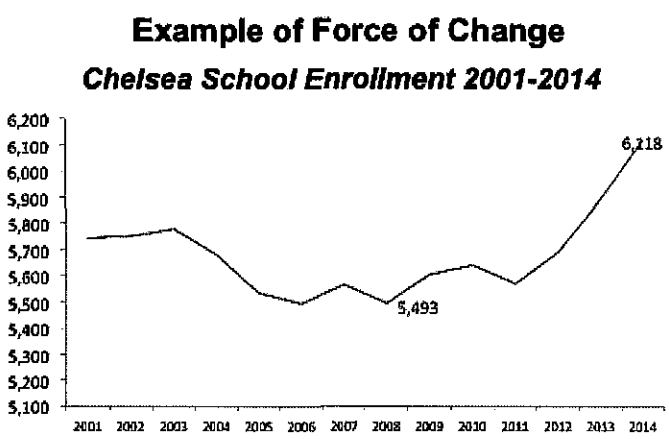
Primary Data Sources: Assessment Committees, Focus Group



Assessment Committee members and focus group participants had many positive things to say about their communities. Communities named diversity, culture, dedicated and compassionate people, committed community-based organizations, collaboration, location, public transportation, churches and schools as some of the positive attributes. The primary perceived challenges within communities included poverty, affordable housing, drug use and overdose, violence and gangs, parental engagement, lack of youth recreational activities, cleanliness of the environment, and lack of diversity in leadership. Understanding both the assets and challenges of each community was essential to developing sustainable solutions.

Forces of Change that Affect Health (Threats and Opportunities)

Primary Data Source: Assessment Committees



The forces of change are external influences occurring locally or nationally that impact the promotion and protection of the public's health. Assessment committee members were asked, "What is occurring or might occur that affects the health of your community?", and a list of threats and opportunities were identified. These issues were important to identify and discuss to select priorities and strategies that are responsive and relevant to the changing environment.

Several common forces of change across the communities were identified. The most frequently mentioned include the cost of housing, the influx of new immigrants, gentrification, local development including the planned casino in the neighboring community of Everett, the promotion and availability of new nicotine delivery devices (i.e. electronic cigarettes), the changes in laws and increased access to marijuana (e.g. decriminalization, medicinal marijuana) and changing leadership in the communities and region.

Characteristics of a Healthy Community

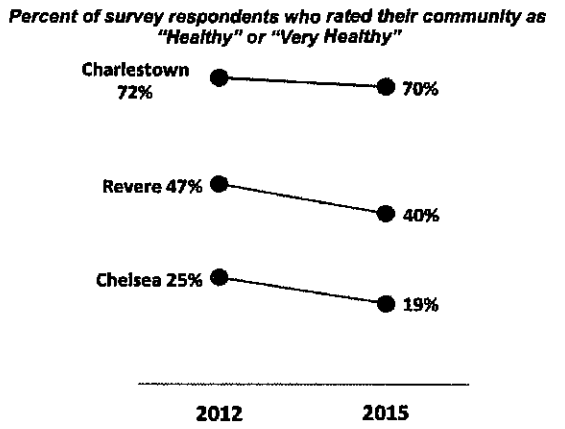
Primary Data Sources: Quality of Life Survey, Focus Groups

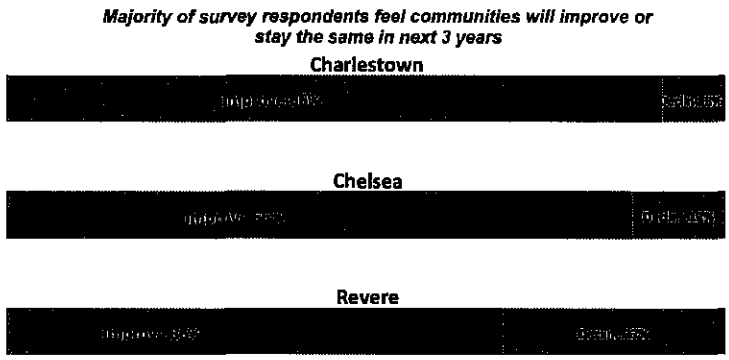
Similar to the 2012 assessment findings, residents told us that low crime/safe neighborhoods, good schools and access to health care were among the top characteristics that make a healthy community. In 2015, this list expanded to include good jobs/healthy economy, clean environment (particularly in Revere) and affordable housing (particularly in Charlestown). These themes also came through in the focus groups. Many spoke about the desire to have the streets cleaned of debris, well paying jobs and jobs/opportunities for youth. These social determinants were important to all, but were significantly more important to Latinos within the three communities. These attributes help define each community's vision and shaped their goals.

Rating the Current & Future Health of the Community

Data Source: Quality of Life Survey

While 2015 survey respondents perceive their communities as less healthy than in 2012, the majority of respondents feel that their community will improve or stay the same in the next three years (new question in 2015).



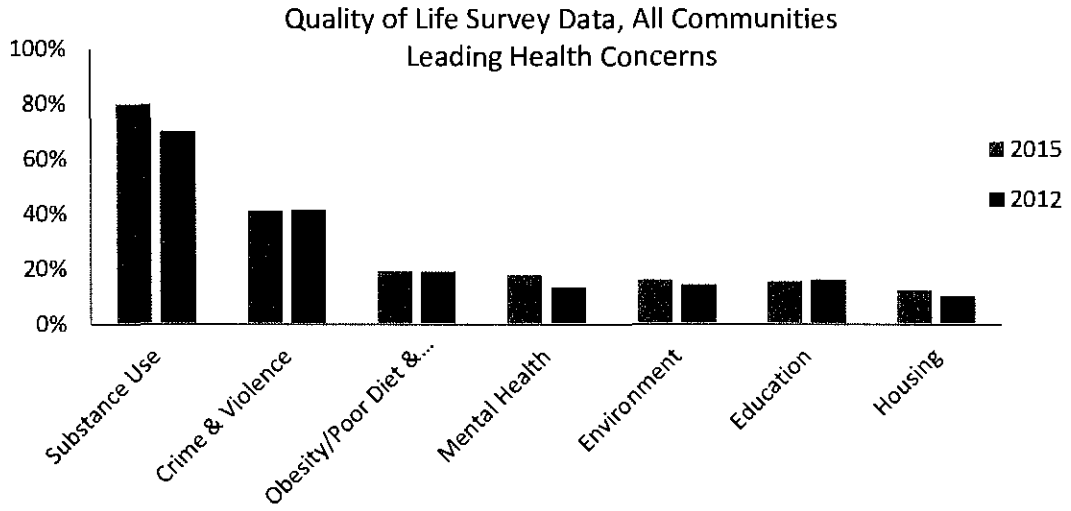


Criteria for Prioritization of Themes

Communities came together to analyze the data and determine priorities that were most relevant. Primary data along with updated secondary data were used to decide if communities were headed in the right direction from the 2012 assessment and if there were any emerging unaddressed health needs.

Priorities were based on 1) community need; 2) potential for impact; 3) community interest, will and readiness, and; 4) resources.

Community Defined Priorities



According to Quality of Life Survey data that asks respondents to identify the top three health issues of concern, substance use and public safety/crime and violence remain the top two perceived health issues for our communities. Substance use has risen significantly in importance, with 80% of survey respondents choosing this as a top health concern in 2015 compared to 70% in 2012. Crime and violence are perceived similarly to 2012. Obesity/poor diet and inactivity remain on the radar; however they have decreased in importance in some communities compared to the 2012 survey.

Concern about mental health has increased significantly in all three communities since 2012, and is significantly more important to females in Revere and Chelsea. Of almost equal concern to community members are education, the environment and housing, all of which are social determinants of health.

It is important to mention that 6.6 % of community members report homelessness as a health concern, an increase since 2012. Additionally, both housing and food insecurity have increased in importance, particularly for the Latino population. Although not seen in the chart above, cancer was also a concern for many Charlestown residents (13% of respondents indicated a top health concern).

Data from the Massachusetts Department of Public Health and the Youth Risk Behavior Survey (YRBS), confirm the prevalence of these important health issues. New emphasis needs to be placed on the mental health needs of residents as well as making sure everyone has the basic necessities of food and shelter.

Substance Use Disorders

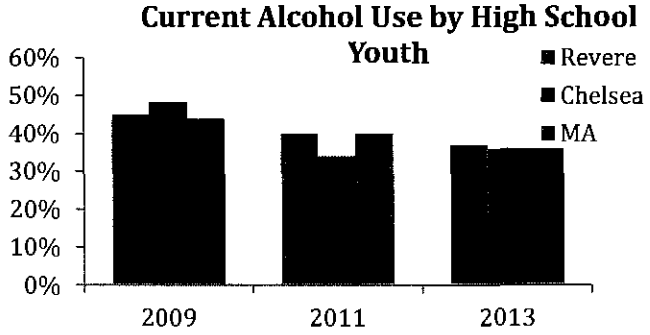
Eighty percent of survey respondents who live and work in these communities believe substance use disorders, consisting of alcohol or drug use, addiction and overdose, is the most important health problem facing their community. This has increased significantly since 2012, and is largely due to the increase in opioid use and heroin overdoses and deaths that have plagued these communities.

There are many complications and risk factors associated with substance use disorders (SUD) that affect the health of individuals and communities. A SUD is a medical condition with significant physical, behavioral, and psychosocial effects. Excessive substance use can cause health problems such as liver disease, heart disease and lung disease to name a few, as well as depression, suicide, unsafe sexual behavior and violence. According to the National Institute on Drug Abuse, prolonged drug abuse changes the brain in fundamental ways that reinforce drug taking and leads to addiction, making this a disease, not a behavior that can be cured with willpower alone. Below are some data to elucidate these findings and emerging trends in drug use.

New Nicotine Devices: The rates of tobacco use have been declining nationally and in these communities, but there has been an increase in both the concern and usage of new nicotine delivery and smoking simulating devices (i.e. e-cigarettes, e-Hookas, vaping pens) that are widely available and often marketed to youth. These devices allow young people to smoke substances more discreetly. Right now these devices are unregulated for manufacturing, product standards and marketing by the federal government. The U.S. Food and Drug Administration recently

proposed rules that would ban the sale of e-cigarettes to anyone under age 18. According to a CDC survey, the smoking of e-cigarettes by high school students overall, tripled to 4.5% in 2013 from 1.5% in 2011. A recent CDC study also found that more than a quarter million adolescents and teens who had never smoked traditional cigarettes used an electronic cigarette in 2013, a threefold increase from 2011. Local data on e-cigarette use is not available. According to focus group participants, however, these devices are perceived to be less harmful than cigarettes, despite any conclusive research data. Revere and Chelsea youth, in particular, report that they are being more widely used. E-Hookahs (colored stick-type vaping pens) are reported be popular among youth and students report seeing these used in school (easy to conceal, no smell).

Alcohol Usage: Alcohol remains the most widely used drug by youth with many youth using before age 13, and many likely to binge drink. The immediate effects of alcohol misuse/abuse include unintentional injuries, violence and risky sexual behaviors as well as alcohol poisoning and death. According to the high school Youth Risk Behavior Survey, 20% of Revere and 23% of Chelsea youth report using alcohol before the age 13. Similarly, between 20% and 22% of youth report current binge drinking. Although current alcohol use has been declining over time, more than two-thirds of youth report current alcohol use.



Alcohol in general still remains a concern for the community with 39% of Quality of Life survey respondents reporting it as a health concern. In Chelsea 40% of Latinos report alcohol abuse/addiction as a problem significantly more than the White Non-Hispanic respondents at 28%.

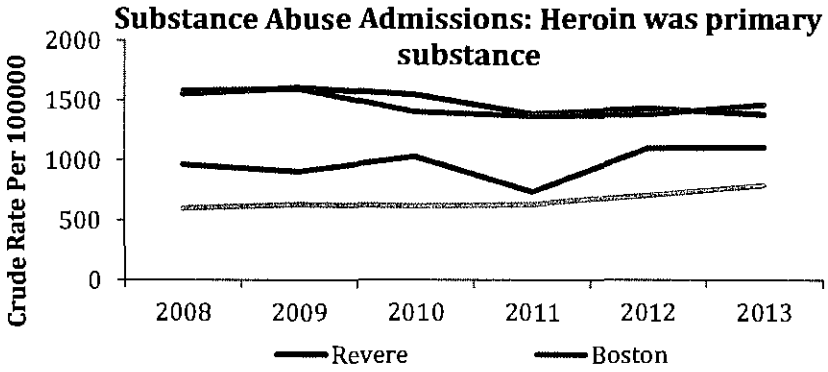
Increase in Marijuana Use Associated with Change in Law: In 2012, the mean age of first marijuana use was 12.8 years in Massachusetts. In Charlestown 5% of middle school youth report using marijuana with the average age of onset as 11.8 years. Revere and Chelsea report 9% and 13.5% using marijuana before age 13. Most focus group participants (particularly youth) agreed that marijuana is a problem in the community and very popular among teens. Teens perceive that "everybody's doing it", it is easy to get, it is affordable and many perceive that it is healthier than cigarettes, suggesting that "at least marijuana doesn't kill you". In Chelsea alone close to 50% of youth report being offered, sold or given marijuana in the past year. The decriminalization of marijuana in the Commonwealth and the establishment of medical marijuana dispensaries throughout the state send confusing messages to youth. Many think marijuana is legal and/or beneficial to use as it may help with ailments, despite research demonstrating marijuana's significant impact on brain development for youth.

"There's no way to stop it. Maybe, but not really. It's a choice." – Teen perspective on marijuana use

Prescription Drug Misuse & Heroin Use: The number of high school youth who report using prescription drugs for recreational purposes is on the rise. According to the 2013 Youth Risk Behavior Survey, 12% of Chelsea High School students (females13.8%; males 10.4%) reported taking drugs without a doctor's prescription in the past 30 days, which is considerably higher than the state rate of 3%. Also from the Chelsea High School 2013 YRBS, 7.5% of students (3.3% in 2011 and 2.8% in 2010) reported using opiates for the first time before age 13, with 8% reporting Oxycontin or heroin use during the past 30 days. Prescription drug misuse, including opioids, benzodiazepines, heroin, is of epidemic proportions.. Prescription drug misuse and overdose and heroin use were identified as a large problem in Chelsea, Revere and Charlestown, and participants reported that obtaining prescription drugs from friends, family, and on the street was easy.

Teen focus group participants explained that teens use substances to cope with problems and stress, because their peers use, to feel cool, for fun or that they use it out of boredom. To prevent substance use, youth expressed wanting more activities afterschool and on weekends, recreational facilities, and job and mentoring opportunities.

Adult Heroin Use: Department of Public Health data show that these communities have higher substance-related hospital discharge and treatment rates for heroin use compared to the state. This is in large part due to the rise of prescription drug misuse (misuse of medications that are used to relieve moderate to severe pain, such as Morphine, Oxycontin and Vicodin) and heroin use.



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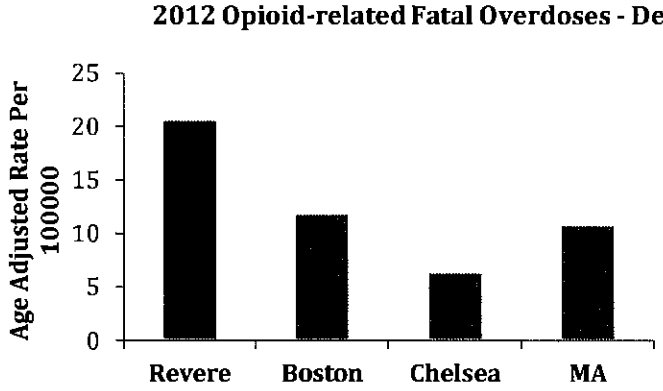
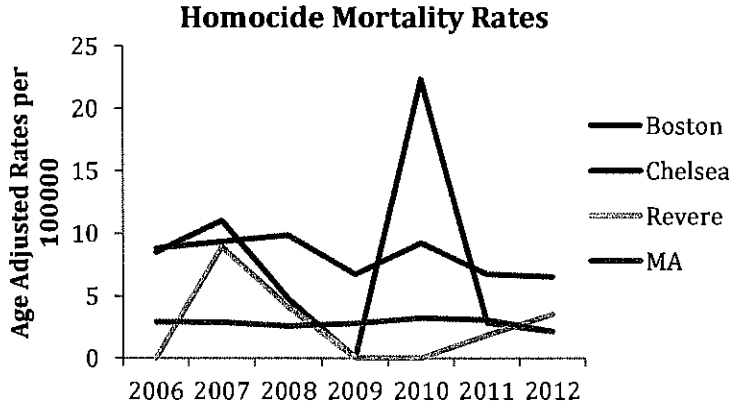
Higher usage has led to more overdoses and overdose deaths within the state. According to a 2015 Massachusetts Department of Public Health report, the rate of unintentional opioid-related overdose deaths, which includes deaths related to heroin, reached the highest levels in 2013 at 14.5 deaths per 100,000 residents representing a 273% increase from the rate of 5.3 deaths per 100,000 residents in 2000. Department of Public Health fatal and non-fatal opioid overdose data describes this population as predominantly white males between the ages of 25-64.
Opioid use and resulting deaths are a serious problem in Revere, Chelsea and Charlestown and the effects are being felt by residents both young and old. In 2014 Chelsea reported 68 overdoses in the city. From January to July of 2015 this number has been surpassed with 98 reported overdoses. Revere and Charlestown have also seen increases in both overdoses and related death. Revere reports a 20% increase in overdoses deaths from 2003 to 2013. The Massachusetts Department of Public Health has been a national leader in by implementing cutting-edge

prevention/intervention strategies. Revere and Chelsea have participated in these efforts through the MassCALL2 and Massachusetts Opioid Abuse Prevention Collaborative Grants and the Charlestown Substance Abuse Coalition is using similar strategies within this neighborhood.



Violence & Public Safety

Forty-one percent of survey respondents perceive crime and violence as an issue in their communities. This issue was discussed extensively in focus groups, and many residents reported feeling unsafe due to the violence that they see and hear about. Both adult and youth focus group participants in all communities reported seeing or hearing about physical fights occurring in public places. Focus group participants also mentioned specific areas where they feel unsafe, particularly at night. Other types of crime that were worrisome amongst participants were gang violence, domestic violence, theft and bullying. Crime and violence is of particular concern in Chelsea. According to both state and national crime data, Chelsea is considered one of the most violent communities in the state. According to 2013 Youth Risk Behavior Survey, many youth are taking part in physical fights and many feel unsafe even at school. Thirty percent of Revere and 24.3% of Chelsea high school youth report being in a physical fight one or more times in the past year. This number has almost doubled from 2011 in Chelsea. In addition 7% of Revere and 10% of Chelsea youth report skipping school in the past month because they felt unsafe compared to the state rate of 4%.

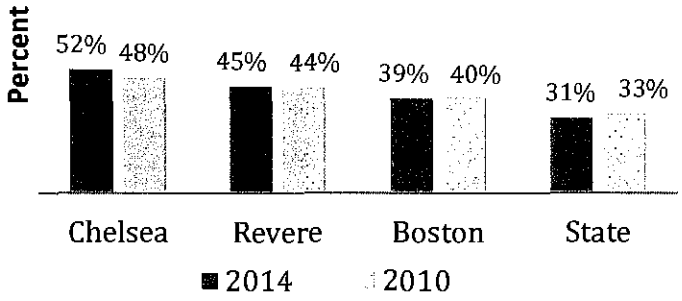


Gang violence has gained more attention in the last year, particularly within Charlestown and Chelsea, although present in Revere. Solutions to these issues suggested in the focus groups included more policing, better lighting on the streets, community watches, programming to teach conflict resolution, youth mentoring programs, and parent education/engagement in communicating with their kids.

Healthy Eating Active Living

Nineteen percent of survey respondents reported obesity or diet and/or inactivity as a concern. Although coalitions in Chelsea and Charlestown have made significant progress to change the food and physical environments so that healthy choices about eating and active living are easier to make, there is still work to be done. The percent of overweight and obese children in both Revere and Chelsea is still higher than the state and nation, with close to half of youth being overweight and obese. Both the short term and long term effects of overweight and obesity on health are of concern because of the negative psychological and health consequences (ex. heart disease, diabetes, asthma, and depression).

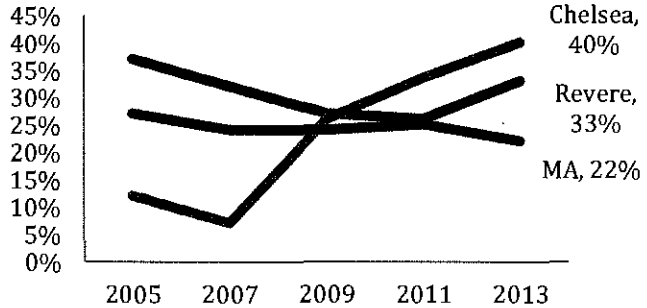
Overweight and Obese Students in Grades 1, 4, 7 and 10



Mental Health

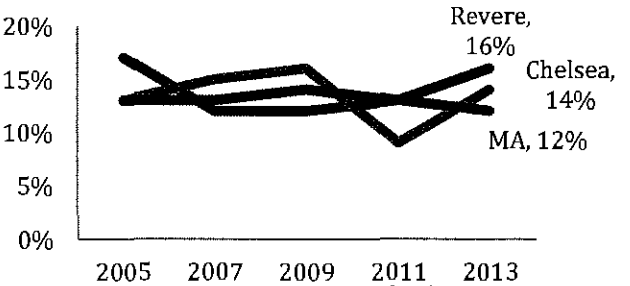
Concerns about mental health have increased significantly since 2012 with more survey respondents reporting it as a health concern. Data from the Youth Risk Behavior Survey reveal that youth are struggling. According to the 2013 High School Youth Risk Behavior Survey, more than one- third of youth from Chelsea and Revere reported feeling sad or hopeless almost every day for two weeks or more in a row that stopped them from doing some usual activities, an indicator for depression. Although not shown in the graph below 30% of Boston youth report feeling depressed. Additionally, between 14% and 16% of youth reported that they considered suicide in the past 12 months compared to the state rate of 12%. Thirteen percent of Boston youth report considering suicide.

Revere & Chelsea Youth Report Higher Rates of Depression than the State



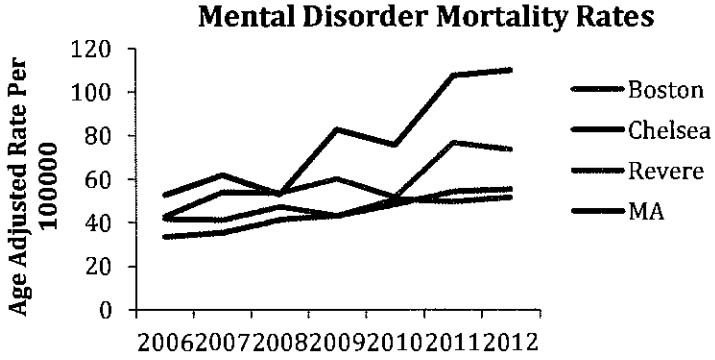
Source: High School Youth Risk Behavior Survey (YRBS)

Revere & Chelsea Youth Report Considering Suicide at Rates Higher than State



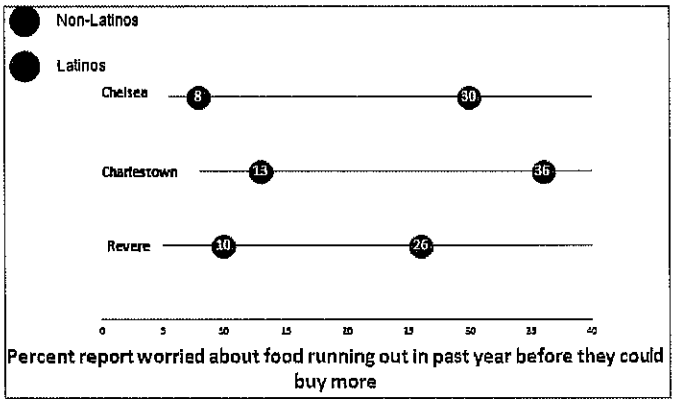
Source: Youth Risk Behavior Survey (YRBS)

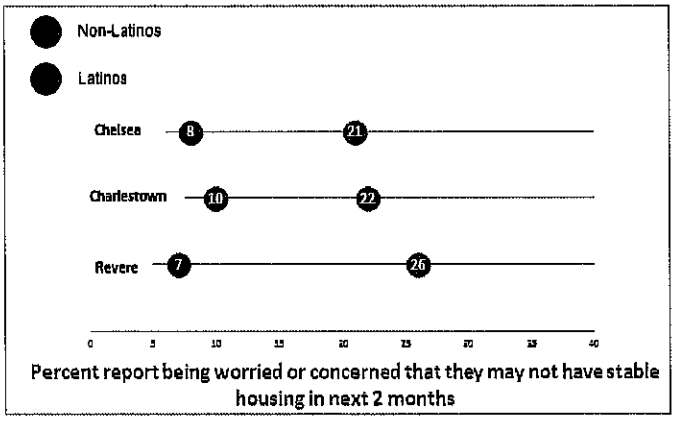
Mental health is prevalent in both youth and adults and has resulted in elevated hospitalization and mortality rates in Revere and Chelsea compared to the state.



This primary and secondary data support the need to address depression and other mental health issues in our communities. Mental and physical health are intertwined and are exacerbated by community conditions such as increased substance use, violence, poverty, housing and food insecurity found in all of these communities. Both needed to be treated together.

Social Determinants of Health (Housing, Education, Environment)





Even when financial obstacles to health care are removed, social, cultural, linguistic, racial, and socioeconomic barriers—the social determinants of health—can prevent people from seeking care or following through on recommended treatment, and contribute to health inequities. In addition, these factors can lead to a culture and climate that fosters unhealthy behaviors and prevent people from living healthy lives.

In all of these communities, **food and housing insecurity** were reported at high rates. Approximately 12% of Massachusetts residents report being food insecure defined by the USDA as the inability to meet food needs during at least 7 months of the year. Seventeen percent of Charlestown and 14% of Chelsea Quality of Life survey respondent's report that the food they purchased did not last long enough and they could not buy more. These numbers increase to 20% and 16% respectively when asked if respondents worried about food running out in the past year. Similarly, between 13%

and 14% report being worried or concerned that they will not have a place to stay in the next two months.

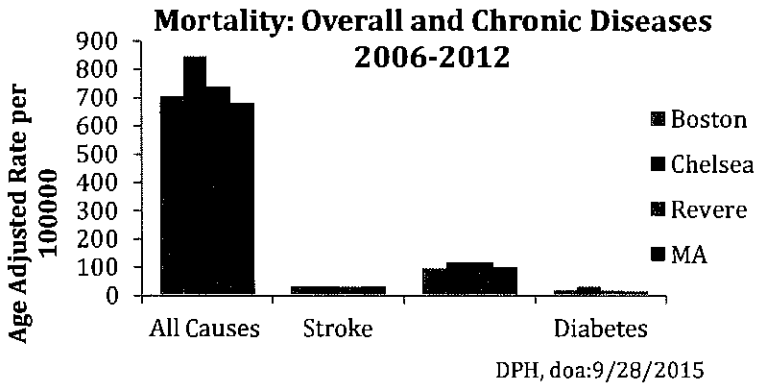
There is a disparity in this concern between Latinos and Non-Latinos, with Latinos reporting insecurity at double or triple the rates of their non-Latino counterparts.

Housing and food insecurity often go hand in hand, and the physical and emotional effects on children and adults are great. For older children poor school performance is often found in those who are housing and/or food insecure.

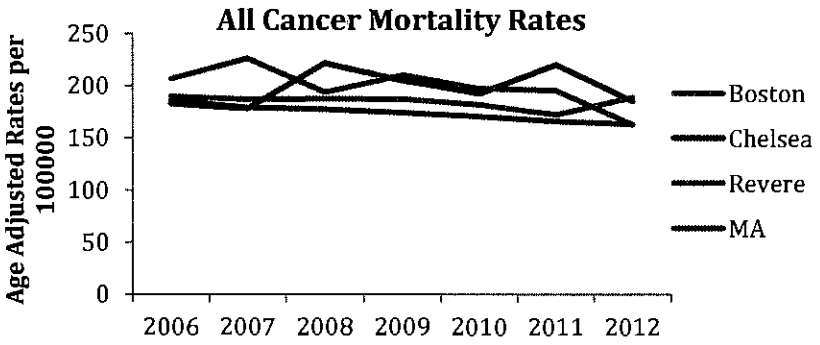
It is not surprising that **educational attainment** is also highly correlated to health status. Fifteen percent of survey respondents report education as being the most important health problem in their community. In all communities graduation rates are much lower than the state rate (see table on page 9) and school systems lack the resources to keep up with the ever-changing needs of their student population. In Chelsea, over the past 24 months, there were 1,955 students in grades 1-12 who have enrolled in school who speak little to no English. Poverty, overcrowding, mobility, language barriers and trauma, particularly for immigrants who experienced or witnessed violence to get to this country, are prevalent.

A **clean environment** was identified as an essential component of a healthy community. Sixteen percent of survey respondents report the environment as being the most important health problem in their community. Focus group participants as well as many survey respondents described many environmental health concerns including unkempt parks and public spaces, roads and buildings in disrepair, and debris on sidewalks. In Revere and Chelsea in particular, the need to improve the aesthetic feel of the community was mentioned. In addition, the lack of open spaces and places to go that felt safe were discussed.

Overall Mortality



In the communities that are faced with an increased burden of these social and physical indicators often brought on by poverty, mortality is often greater. In Boston, the difference in life expectancy by census tracts is 33 years (Joint Center for Political and Economic Studies' Place Matters reports.) The communities of Revere, Chelsea and Charlestown are no different than other communities faced with these same disparities. Mortality rates brought on by chronic disease such as diabetes, as well as from cancer, is higher in these communities compared to the state overall.



Issues Not Tackling

The MGH and the Center for Community Health Improvement are working to address the health priorities determined by the CHNA through the Center's three approaches, and hospital and health center's patient focused disease outreach programs. Our implementation report, however, is not inclusive of all patients and communities.

Violence and crime, including gang violence is not directly addressed through our health strategies and approaches. The MGH will look for opportunities to collaborate with police and other organizations to address this important health issue. The strategies and ideas that were identified by all communities to address violence will be shared with community partners.

Strategies & Implementation Plan

CCHI addresses these community priorities using the following 3 approaches:

Building and Sustaining Multi-Sector Coalitions - CCHI is the backbone organization that uses a "collective impact" framework to support four multi-sector community coalitions that work to prevent and reduce substance use and obesity. CCHI acts as a convener and provides staff, best practices, evaluation services, grant writing, and other resources to support the coalitions' community-based leadership. Each coalition works with the 12 sectors recommended by Community Anti Drug Coalitions of America (CADCA) to change policies and practices to prevent teen substance use, reduce harm from opioids, and improve physical and food environments to make healthy choices easier.

Developing the Assets of Youth - Educational attainment is one of the most important social determinants of health. MGH has partnered for 25 years with Boston, Chelsea and Revere public schools to provide educational and career opportunities for thousands of youth interested in health and science careers. In 2013-2014 MGH offered these opportunities to 650 young people in grades 3 through college, the vast majority of whom are low-income students of color.

Improving Access to Care for Vulnerable Populations - Even when financial barriers to care are removed, social, cultural, linguistic, racial, and socioeconomic barriers can prevent people from seeking care and contribute to inequities in morbidity and mortality. CCHI supports multiple programs that reduce these barriers for vulnerable patients, including through the services of community health workers and navigators, a medical-legal partnership that improves access to housing and income benefits, and outreach programs. Multicultural staff connects patients with community-based resources, acting as a bridge between health care providers and the community.

Detailed action plans for each priority area over the next 3 years are listed below. Action plans are evaluated annually and refined based on changing community needs. Topics, objectives and targets set by *Healthy* People 2020 serves as a guide to identify priorities, outcomes measures and data sources. When applicable we will use Healthy People 2020 as our benchmark.

Priority Area	Goals
Substance Use	1. Provide "backbone support" to multi-sector coalitions using a collective impact model to make policy, systems and environmental changes to reduce youth substance use and prevent opioid overdoses and deaths. 2. Transform care for those with substance use disorders by reducing stigma and developing a chronic disease management model of care that spans from the community to the bedside.
Violence and Public Safety	1. Support police departments and community organizations in their efforts to reduce violence by advocating for and collaborating on evidence-based strategies. 2. Continue to support MGH-based violence intervention programs.
Healthy Eating, Active Living, and Food Insecurity	1. Provide "backbone support" to multi-sector coalitions using a collective impact model to make policy, systems and environmental changes to increase access to affordable, healthy foods and physical activity. 2. Screen for and provide resources to patients who are struggling with food insecurity
Mental Health & Trauma	1. Create and support existing community-wide learning collaboratives with agencies and leaders to build trauma-informed communities that promote resiliency in young children and families. 2. Train MGH staff on understanding the effects and recognizing the symptoms of trauma, and ensure staff do not re-traumatize patients. Additionally, ensure that staff are supported to avoid secondary trauma or re-traumatization themselves. 3. Work with MGH Psychiatry and organizations to intervene early to prevent mental health problems and build resilience in youth, and strengthen mental health delivery systems.
Social Determinants of Health (Housing, Education, Environment)	1. Continue to screen and provide connections to resources for MGH patients. 2. Build and strengthen partnerships with community agencies that address the social determinants of health and work towards solutions. 3. Continue to expose and inspire youth to Science, Technology, Engineering, and Math (STEM) subjects, health and wellness, college readiness, and careers by strengthening and growing the MGH Youth Programs.

Priority: Substance Use	
Goal	**Partners**
1. Provide "backbone support" to multi-sector coalitions using a collective impact model to make policy, systems and environmental changes to reduce youth substance use and prevent opioid overdoses and deaths.	MGH Community Health Centers, Cities of Revere and Chelsea; Boston neighborhood of Charlestown Revere, Chelsea, Charlestown Schools, Revere, Chelsea, Charlestown Police Departments, Local community agencies, parents, residents, and youth in Revere, Chelsea, Charlestown.
Strategy	**Actions**
Education: Continue to provide substance use prevention education, particularly around marijuana, nicotine devices, and opioids to parents and youth.	Work with schools, organizations, and medical providers to develop materials and educate youth and parents on the dangers of substance use, nicotine devises, the laws around medical marijuana, and removing unnecessary access to prescription medications. Provide evidence-based curriculum in schools and with community agencies Consult with media experts in the delivery and creation of web portals. Distribute resources in various languages through various media such as newspaper and social networks Disseminate health educational materials by participating in community events Organize community-wide events such as memorials to increase awareness and reduce stigma.
Education: Continue to provide opioid overdose prevention and harm reduction education to those struggling with addiction, families, and medical providers.	Partner with community organizations to regularly provide workshops on recognizing the signs and symptoms of an overdose and what to do if one occurs. Work with MGH and community partners to distribute Narcan to users, their families, and bystanders and advocate that first responders, who do not yet carry Narcan, do so. Advocate for recovery drop-in centers in each community.
Social Marketing: Implement additional community and school-wide social marketing campaigns to increase education and change social norms.	Review and adapt social marketing campaigns already implemented in other communities or nationally. Contract with professional consultants for the development of local campaigns. Identify common community strategy to be implemented across all MGH communities.

Collaboration: Increase engagement, communication, and access to programs and services between community members, providers, patients, CCHI staff and other professionals, and build capacity within outside agencies.	Partner with the schools to Increase number of youth, parents; partner with other community sectors engaging in coalitions, partnerships, and attending events such as departments of parks and recreation, community-based immigrant or ethnic organizations, faith groups, youth centers, and state-run programs and services. Work with partners to expand initiatives though grants, programs, and policies. Support the expansion of service learning & community service for youth, and peer leadership programs.
Policy: Monitor, educate, advocate, support and assist in the changing of policies of cities, schools, organizations, local and state that regulate all aspects of substance use from its legality status to those influencing social behavior.	Identify partners and opportunities to create or amend policies that support youth resiliency and decrease factors that lead to substance use. (Examples include advocating for local e-cig regulations; smoking bans in public housing and Narcan with all first responders)
Environmental: Continue to support programs to reduce access to prescription drugs and unclean needles.	Organize and participate in Medication Take Back Events and needle clean-up. Promote the local Medication Disposal program. Monitor parks and open spaces for issues associated with ATOD use.
Goal	**Partners**
2. Transform care for those with substance use disorders by reducing stigma and developing a chronic disease management model of care that spans from the community to the bedside.	MGH General Medicine, MGH Psychiatry, MGH Community Health Centers, Community-based treatment providers, Boston Health Care for the Homeless Program
Strategy	**Action**
Clinical Interventions: Continue and work to expand Substance Use Disorders initiative across the hospital and MGH health centers.	Components of the plan include a specialized inpatient multi-disciplinary addiction consult team (medicine psychiatry, nursing social work, recovery coaches), a post-discharge clinic, enhanced outpatient care at health centers including expanding access to medication assisted treatment, and recovery coaches, peers in recovery who help patients make the connections between inpatient, outpatient and community-based recovery treatment and support services.

Expected Long Term Outcomes associated with this priority:

- → Decrease current use of alcohol & tobacco among youth and adults.
  - o Source: Youth Risk Behavior Survey; Behavior Risk Factor Surveillance System
- → Decrease the percent of current marijuana usage among youth.
  - o Source: Youth Risk Behavior Survey
- → Decrease the percent of prescription drug usage among youth.
  - o Source: Youth Risk Behavior Survey
- → Increase the percent of youth who perceive great risk associated with substance abuse.
  - o Source: Youth Risk Behavior Survey
- → Decrease opioid overdoses and deaths.
  - o Source: Police Data, Mass. Department of Health Bureau of Substance Abuse Services
- → Decrease length of stay and addiction severity and readmission rates for inpatients with a SUD
  - o Source: Hospital medical data

Priority: Violence and Public Safety	
Goal	**Partners**
1. Support police departments and community organizations in their efforts to reduce violence by advocating for and collaborating on evidence-based strategies.	MGH Community Health Centers Cities of Revere and Chelsea; Boston neighborhood of Charlestown Revere, Chelsea, Charlestown Schools Revere, Chelsea, Charlestown Police Departments Local community agencies in Revere, Chelsea, Charlestown
Strategy	**Action**
Collaboration: Collaborate with agencies that are working on violence and public safety as needed and as work intersects	Participate in and ensure communication between coalitions and other community collaborative initiatives, such as police departments, Chelsea Thrives, an initiative funded by the Working Cities Program of the Federal Reserve, and Hub and COR, an evidence-based approach for agencies to collaborate on those at risk for violence. Collaborate on grants to build capacity as they arise. Support the expansion of after school programming and
Environmental: Collaborate with environmental enhancements that contribute to the safety of open spaces.	Collaborate with mobilizing community residents to clean-up activities of the environment including at parks and open spaces.
Goal	**Partners**
2. Continue to support MGH-based violence intervention programs.	MGH Social Services Department MGH Emergency Department
Strategy	**Action**
Education: Support and connect victims of domestic and community violence to needed resources	Support access to HAVEN, the domestic violence advocacy program for MGH patients and community members who have experienced domestic violence. Support access to the Violence Intervention Advocacy Program, the violence intervention program for patients brought to the MGH Emergency Department as a result of their violence-related injuries

Expected Long Term Outcomes associated with this priority:

- → Increase the feelings of safety in one's community and home.
  - o Sources: Community Survey & Focus Groups; program data

Priority: Healthy Eating, Active Living, and Food Insecurity	
Goal	**Partners**
1. Provide "backbone support" to multi-sector coalitions using a collective impact model to make policy, systems and environmental changes to increase access to affordable, healthy foods and physical activity.	MGH Community Health Centers, Cities of Revere and Chelsea; Boston neighborhood of Charlestown Revere, Chelsea, Charlestown Schools, Local community agencies, parents, residents, and youth in Revere, Chelsea, Charlestown
Strategy	**Action**
Outreach and Communication: Work with partners to provide education, and resources around healthy eating and active living to youth and adults by participating in community-wide events, promoting events with similar goals, and communicating through various media channels such as Facebook and websites.	Communication specialist and/or contracted firm will maintain website and social media pages. Staff will attend and host tables at community events Staff will organize community-wide events that educate and promote healthy eating and active living.
Collaboration: Reach out to organized neighborhood groups or engage neighborhoods to organize groups to implement activities that will increase access to healthy eating and active living.	Facilitate an organizing process to create new neighborhood groups and help build their capacity. Visit organized neighborhood group meetings and invite them to adopt HEAL goals.
Collaboration: Work in partnership with the schools to: increase physical activity through a walk to school program, and through the support of classroom activity breaks, and increase access to healthy foods through the engagement of the school food service and student activities to bring palatable, healthy foods to students	Work with youth to educate them on healthy eating & active living and to learn how to advocate for healthier school food. Implement walkability audits, trace routes and organize walk to school events. Offer support and ideas for in-classroom fitness breaks.
Physical Environment: Work with municipalities, neighborhood groups, local and regional planning organizations, local pedestrian and bicycle advocate organizations and park organizations and funders of parks to change community design standards to make streets and open spaces safe for all users.	Collaborate with Walk Boston for walkability audits to mark urban trails, safe routes to schools and wayfinding signage strategies. Work with MassBike and facilitate local conversations for the striping of bike lanes and bike safety education and work with Bike to the Sea for the completion of bike trails. Secure grants and organize community builds to restore playgrounds
Physical Environment: Work with inspectional services, board of health, residents and local businesses to make healthy foods accessible, available, and affordable in corner stores, restaurants and farmers markets and neighborhoods.	Engage the board of health and inspectional services to support healthy corner stores and healthy dining initiatives. Recruit corners stores and restaurants to participate in healthy eating initiatives. Organize, support and facilitate school and community gardens. Support and organize a Farmers Market with an incentive program for the use of WIC and senior

	coupons and electronic benefit transfer program.
Policy: Monitor, educate, advocate, support and assist in the changing of policies of cities, schools, organizations, local and state that regulate all aspects of healthy eating and active living from its legality status to those influencing social behavior.	Engage city officials to adopt a "Complete Streets" policy that takes into account automobiles, pedestrians, bicyclists and users of public transit. Monitor federal artificial transfat policy changes. Monitor school food policies. Influence local inspectional office policies and practices for the support of healthy corner store and healthy dining initiatives.
Goal	**Partners**
2. Screen patients who are struggling with food insecurity and provide resources	MGH Community Health Centers Local community agencies in Revere, Chelsea, Charlestown
Strategy	**Action**
Clinical Intervention: Provide community health workers to work with food insecure patients	Screen for food insecurity in all departments of the health centers. Ensure community health workers reach out to food insecure patients and provide resources to patients, such as SNAP (food stamps) application assistance, list of food pantries, and emergency food vouchers. Implement grant-funded partnership with local community development corporation to refer food insecure patients to their resources and measure impact on health.

Expected Long Term Outcomes associated with this priority:

- → Increase contribution of fruits and vegetables to the diets of the population (adults and youth).
  - Source: Youth Risk Behavior Survey; Behavior Risk Factor Surveillance System
- → Increase the proportion of adults and children who meet current federal physical activity guidelines for aerobic physical activity. (Youth: 1 hour per day, 5+ days a week/Adults: 30 minutes a day, 5+ days a week adults).
  - Source: Youth Risk Behavior Survey; Behavior Risk Factor Surveillance System
- → In Chelsea and Revere, reduce the proportion of public school children who are overweight or obese.
  - Source: School Nurse Data
- → Decrease the proportion of households experiencing food insecurity.
  - Source: U.S. Census Bureau

Priority: Mental Health & Trauma	
Goal	**Partners**
1. Create and support existing community-wide learning collaboratives with agencies and leaders to build trauma-informed communities that promote resiliency in young children and families.	MGH Community Health Centers,, Cities of Revere and Chelsea; Boston neighborhood of Charlestown, Revere, Chelsea, Charlestown Schools, Local community agencies, parents, residents, and youth in Revere, Chelsea, Charlestown
Strategy	**Action**
Outreach and Communication: Work with partners to provide education, knowledge, and promote events around trauma informed care, mental health, and healthy development	Host meetings and support community agencies to implement plan-do-study-act cycles to increase the number of trauma-informed policies Leverage current CCHI outreach and communication to stress the connections between mental health and substance use
Collaboration: Support the expansion of after school programming and activities to provide youth with healthy activities that develop social skills, resilience, and other core developmental assets	Support a positive youth development initiative with both school and community components; work with schools towards implementation and evaluation of curriculum based in positive youth development practices
Goal	**Partners**
2. Train MGH health center staff on understanding the effects and recognizing the symptoms of trauma, and ensure staff do not re-traumatize patients. Additionally, ensure that staff are supported to avoid secondary trauma or re-traumatization themselves.	MGH Community Health Centers, Local community agencies in Revere, Chelsea, Charlestown
Strategy	**Action**
Education: Advocate for a trauma-informed approach across the hospital	Continue to participate in the Partners-wide Trauma-Informed Care (TIC) committee Ensure CCHI staff are trained in TIC Implement reflective supervision across CCHI staff
Goal	**Action**
3. Work with MGH Psychiatry and local organizations to assess opportunities to implement evidence-based prevention strategies build resilience in youth, and strengthen mental health delivery systems.	Identify and meet with partners to assess critical need and identify best practices for community mental health resources Work with partners to seek support for resources to provide resources and services.

Expected Long Term Outcomes associated with this priority:
This is a newly identified community priority and over the next year we will meet with internal and external partners to develop strategies and identify measures of progress.]

Priority: Social Determinants of Health (Housing, Education, Environment)	
Goal	**Partners**
1. Continue to screen and provide connections to resources for MGH patients.	MGH Community Health Centers, Cities of Revere and Chelsea, Boston neighborhood of Charlestown, Community agencies in Revere, Chelsea, Charlestown
Strategy	**Action**
Clinical Intervention: Screen for the social determinants of health (SDH) at all primary care visits.	Educate providers on the SDH and how they can affect health outcomes Work with IT systems to include the SDH questionnaire in patient medical records Advocate for increased services to address the SDH
Clinical Intervention: Provide all medically and psycho-socially complex MGH health center patients with Community Health Worker.	Train all Complex Patient Population Community Health Worker (CPP CHWs) to work with patients to address barriers to care, and support patients to achieve goals. Implement SDH questionnaire as part of the CPP CHW initiative. Institute pathways of referrals to internal programs and outside agencies to address the SDH.
Goal	**Partners**
2. Build and strengthen partnerships with community agencies that address the social determinants of health and work towards solutions.	MGH Community Health Centers, Local community agencies in Revere, Chelsea, Charlestown, The Neighborhood Developers, CAPIC, Public Schools
Strategy	**Action**
Collaboration: Work with partners to expand initiatives though grants, programs, and policies that tackle the social determinants of health.	Actively seek opportunities to engage MGH providers and community partners to address housing, education, and the environment. Implement grant-funded partnership with local community development corporation to refer housing insecure patients to their resources and measure impact on health. Collaborate with city on Working Cities, Plan Revere, and other key efforts in addressing economic development, equity, housing, and environmental improvements. Collaborate with public schools to collect, analyze, and disseminate YRBS; inform schools of positive and negative trends among student population regarding quality of life and behavior. Collaborate with public schools to address health issues that affect educational attainment and support programs that increase educational and social equity among students and their families.

Goal	Partners
3. Continue to inspire an interest in youth in Science, Technology, Engineering, and Math (STEM) subjects, health and wellness, college readiness, and careers by strengthening and growing the MGH Youth Programs.	MGH - Internal Departments and Community Health Centers; Boston, Chelsea and Revere students, their families, schools, and community-based organizations.
Strategy	**Action**
Education: Continue to offer youth in grades 3 – 12 and beyond, with STEM exploration, hands-on experiences, health and wellness education, mentoring, academic &summer employment, college readiness, and high level internships.	Partner with schools and local Boys and Girls Clubs of Boston branches to provide an after school curriculum to stimulate an interest in STEM in grades 3-8. Continue to provide science fair mentors to 7th and 8th graders at the Timilty Middle School. Provide programming for all four years of high school students that exposes them to health careers, provides college readiness and jobs in the junior and senior years Provide opportunities for about 200 young public school students in the City of Boston at MGH for the summer Support graduates of MGH high school programs to succeed in college with scholarship, as well as mentoring, tutoring and other support.

Expected Long Term Outcomes associated with this priority:

- → Patients report increased Health-related Quality of Life and Wellbeing
  - Source: PROMIS10 questionnaire
- → Patients report decreased food and housing insecurity
  - Source: Social Determinants of Health questionnaire
- → Increase educational achievement for youth participating in CCHI programs, including high school and college graduation.
  - Source: Program data
- → Youth who are exposed to STEM careers will choose to follow a STEM career path
  - Source: Program data

Appendix

Community Health Needs Assessment Committee Members

Revere

Name	Organization/Affiliation
Fanny Araque	Early Childcare Provider
Elle Baker	City of Revere/Revere on the Move
Barbara Bishop	Speaker DeLeo's Office
Kitty Bowman	Revere CARES Coalition
Tania Buck	FKO Afterschool
Diane Colella	City of Revere
Julie Demauro	City of Revere/Revere on the Move
Carol Donovan	City of Revere Health Department
Selene Erazo	Resident
Megan Fidler Carey	Revere Public Schools
Jonina Gorenstein	MGH CCHI/CHA
Carol Haney	Revere Beautification Committee
Kim Hanton	North Suffolk Mental Health Association
Ann Houston	The Neighborhood Developers
Vanny Huot	The Neighborhood Developers
Andie Janota	City of Revere/Revere on the Move
Gurpal Kaur	Youth
Andy Lafontant	Youth
Miles Lang Kennedy	City of Revere Mayor's Office
Judy Lawler	Chelsea District Court
Kenia Maldonado	Youth
Chris Malone	Revere Public Schools
Eileen Manning	MGH CCHI/CHA
Leandro Montoya	Youth
Julia Newhall	City of Revere/WROC/MOAPC
Ira Novoselsky	City Council
Amy O'Hara	Revere Poice Department
Roger Pasinski, MD	MGH Revere HealthCare Center
Dimple Rana	City of Revere/Revere on the Move
George Reuter	The Neighborhood Developers
Ervin Rivera	City of Revere/Revere on the Move
CarrieAnn Salemme	WROC/MOAPC, North Suffolk Mental Heath Association
Ming Sun	MGH CCHI/CHA
Michael Try	City of Revere/Revere on the Move
Carol Tye	Revere Public Schools, School Committee
Joshua Ward	Youth
Joseph Ward	Youth

Chelsea

Name	Organization
Tom Ambrosino	City of Chelsea
Dave Betz	Chelsea Police Department
Roseann Bongiovanni	Chelsea Collaborative
Mary Bourque	Chelsea Public Schools
Michelle Camiel	Cooking Matters
Nancy Ellen Capistran	MGH Chelsea
Margaret Carsley	Chelsea Community Garden
Jim Cunningham	Chelsea Revere Winthrop Elder Services
Jennifer DeCourcey	Soldiers' Home
John DePriest	City of Chelsea Department of Planning and Development
Arlan Dobson	North Suffolk Mental Health Association
Judith Dyer	Resident and CAPIC Board of Directors
Al Ewing	Chelsea Housing Authority
Bonnie Fishman	MGH Chelsea
Ron Fishman	MGH Chelsea/CCHI
Sharon Fosbury	The Neighborhood Developers
Tracie Gillespie	UMass Extension
Kim Hanton	North Suffolk Mental Health Association
Madelyn Herzog	Food Corps
Mary Lyons Hunter	MGH Chelsea
Katie Kalina	Community Substance Abuse Centers
Phyllis Kinson	Chelsea Revere Winthrop Elder Services
Molly Lawrence	Cataldo Ambulance
Tara McCarthy	MGH WIC
Mary McKenzie	City of Chelsea Health Department
Yanya Noor	MGH Chelsea
Paul Nowicki	Chelsea Housing Authority
Sarah Oo	MGH Chelsea Community Health
Ana Perez	MGH Chelsea
Cheryl Poppe	Soliders' Home
Luis Prado	Chelsea Health and Human Services Department
Sylvia Ramirez	Chelsea Collaborative
Toby Raybould	MGH Trauma, Emergency Surgery and Surgical Critical Care
Dan Reindeau	Cataldo Ambulance
Bob Repucci	CAPIC, Inc.
George Reuter	The Neighborhood Developers
Scott Richardson	Project Bread
Ruben Rodriguez	North Suffolk Mental Health Association
Joanne Stone-Libon	CAPIC Head Start
Ming Sun	MGH CCHI/CHA
Francisco Toro	City of Chelsea Veteran's Services
Melissa Walsh	The Neighborhood Developers / Chelsea Thrives
Maryanne Winship	Salvation Army

Charlestown

Name	Organization
Jean Bernhardt	MGH Charlestown HealthCare Center
Miles Byrne	Resident / Corcoran Realty
Peggy Carolan	Charlestown New Health
Sarah Coughlin	Charlestown Substance Abuse Coalition
Lori D'Alluva	Charlestown Adult Education
Johan de Besche	MGH Institute for Health Professions
Lori Deliso	Kids Cooking Green
Crystal Galvin	John F. Kennedy Family Center, Inc./Resident
Sean Getchell	Aid to Rep Daniel Ryan
Tommy Howard	Charlestown Recovery House/Resident
Deborah Hughes	Special Townies Organization/Resident
Rebecca Kaiser	Spaulding Rehabilitation Hospital
Terry Kennedy	John F. Kennedy Family Center, Inc./Resident
John Killoran	Charlestown Boys and Girls Club
Shannon Lundin	Charlestown Substance Abuse Coalition
John McGahan	The Gavin Foundation
William McNicholas	Charlestown Division of Boston Municipal Court
Paul Murphey	MGH Institute for Health Professions
Pete Nash	Charlestown Boys & Girls Club
James Ronan	St. Mary's Catherine of Siena Parish
Jessica Rubin	Charlestown Boys and Girls Club
Kevin Smith	Charlestown Recovery House/Resident
Steve Telesmanick	YMCA
Jim Travers	Charlestown Recovery House/Resident
Gretchen Wagner	Charlestown Substance Abuse Coalition
Rosie Wall	Kids Cooking Green
Rosanne Spinali Walsh	CAPE (Cancer Awareness, Prevention & Education)
Dave Whelan	Charlestown Neighborhood Council/Resident
Phenice Zawatsky	Charlestown Family Support Circle

Attachment/Exhibit

B

2016 Community Health Needs Assessment:

Adolescent Substance Use and Mental Health

Massachusetts General Hospital
Prepared by the Center for Community Health Improvement

MASSACHUSETTS GENERAL HOSPITAL

CENTER FOR COMMUNITY HEALTH IMPROVEMENT

CCHI's Mission:

To improve the health and well-being of the diverse communities we serve

About Us:

Working with our community and hospital partners, the Massachusetts General Hospital Center for Community Health Improvement brings together the people and resources needed to address challenging health problems—and promote policy and systemic change that will foster measurable and sustainable improvement.

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Introduction

This Community Health Needs Assessment (CHNA) focuses on the factors contributing to adolescent substance use and mental health in the communities Massachusetts General Hospital (MGH) serves: Chelsea, Revere, Charlestown, and East Boston.

Approximately 90% of Americans who meet the criteria for addiction started using substances (tobacco, alcohol, or other drugs) before age 18 (CASA, 2011). The total cost of substance use is at least $468 billion per year in America (CASA, 2009). And yet, adolescent substance use, which has consequences including injuries, depression and anxiety, reduced educational attainment, and criminal involvement, is preventable. Likewise, issues surrounding adolescent mental health can disrupt school performance, harm relationships, and lead to substance use disorders and suicide. According to the 2015 National Survey on Drug Use and Health (Center for Behavioral Health Statistics and Quality, 2016), 12.5 percent of adolescents aged 12 to 17 nationally had a major depressive episode in the past year. This percentage has been increasing over the past 15 years. Additionally, the percentage of the adolescents who used substances in the past year was higher among those with a major depressive episode than among those without (31.5 vs. 15.3) nationally.

This report reviews data on the status of mental health and substance use among youth in our communities, the factors that contribute to this problem, the process by which our communities prioritized these factors, and the strategies the MGH Center for Community Health Improvement (CCHI) and its multi-sector community coalitions will employ to prevent and reduce adolescent substance use and address issues related to mental health.

This report was reviewed and approved by the MGH Trustee Board Committee on Community Health on September 20, 2016.

Executive Summary

Problem

The 2015 MGH Community Health Needs Assessment (CHNA) indicated increased community concern about adolescent substance use and mental health. This concern is verified by quantitative data that indicates, in particular, significantly higher rates of adolescent depression in the MGH communities of Charlestown, Chelsea, East Boston, and Revere than other communities statewide. Given high rates of opioid use among older teens and young adults, and the link between mental health issues and substance use, communities felt an urgent need to understand the problem better and to go upstream to develop a comprehensive prevention plan.

Approach

Beginning February, 2016, MGH CCHI worked with its multi-sector community coalitions to review and analyze quantitative data. MGH CCHI then conducted interviews and focus groups with over 200 youth, mental health experts, and those working with youth to provide insight into the issues. We brought that data back to the coalitions and researched the factors in the public health literature that create risk or protection for or against substance use and depression. We then asked the communities over the course of two meetings to prioritize the factors most relevant in their communities. Based on those factors, the coalitions developed strategies to either strengthen the protective factors or reduce the risk factors.

Findings

All Factors in the Public Health Literature that Contribute to Preventing Adolescent Substance Use and Mental Health Issues

Positive Relationships with Adults

Parental & Peer Disapproval of Substance Use

Accessible Extracurricular Activities

Lack of Access to Substances

Perception of Harm from Substances

Addressing & Managing Stress

Executive Summary

Strategies to Address Prioritized Factors	
	Increase job shadowship programs and youth jobs
	Enhance adult capacities for informal and formal mentorships and communication with youth
	Collaborate with organizations to advocate for age-appropriate youth activities in each community
	Engage youth as part of each community coalition
	Increase coping skills of youth and adults to positively manage and reduce stress
	Implement social marketing campaign to increase perception of harm of adolescent marijuana use
	Collaborate with schools and organizations to incorporate a curriculum that addresses substance use and mental well-being

Our Commitment to the Community

MGH has a long legacy of caring for the underserved in the local community. Founded in 1811 to care for the "sick poor," MGH demonstrates that same commitment today by supporting four community health centers (which we have done for almost 50 years), and enlisting a comprehensive approach to addressing the social determinants of health. MGH Trustees affirmed this commitment in 2007 by expanding the hospital's mission to include "...improve the health and well-being of the diverse communities we serve."

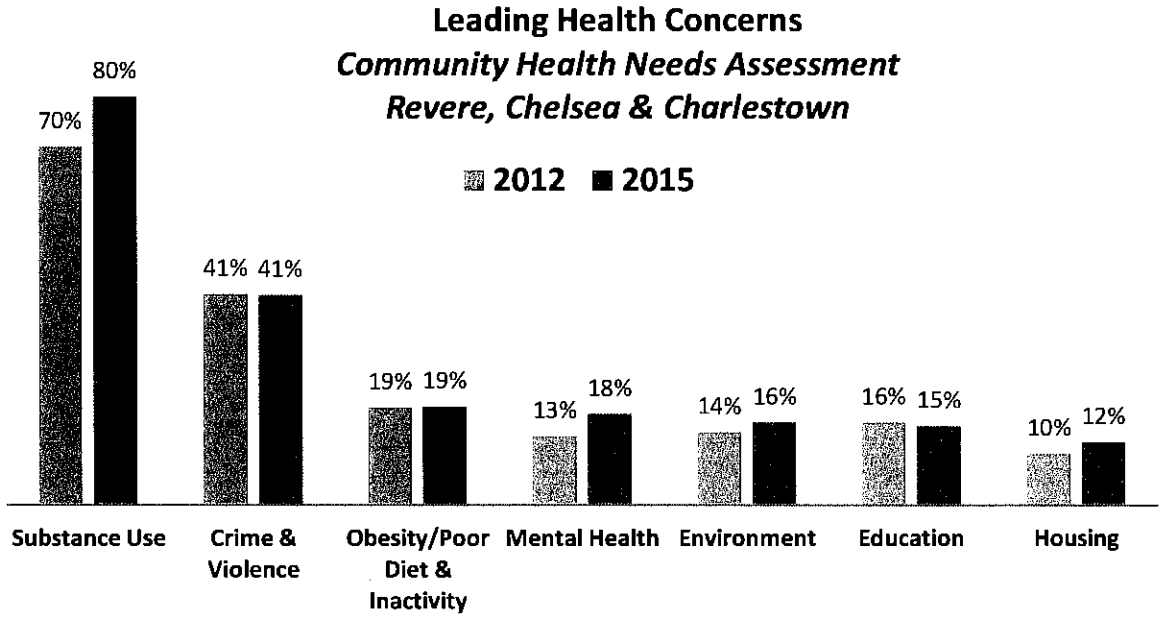
MGH recognizes that access to high quality health care is necessary, but by no means sufficient, to improving health status. We must also engage in deep and transformative relationships with local communities to address the social determinants of health. MGH created the Center for Community Health Improvement (CCHI) in 1995, with the mission of collaborating with communities to achieve measurable, sustainable improvements to key indicators of the communities' health and well-being. Since 1995, MGH has partnered with the low income neighboring communities of Revere, Chelsea, and Charlestown, and more recently East Boston, to make measurable improvements in health. We have done this by routinely conducting health needs assessments and by partnering with leaders of local government, public health officials, schools, police departments, community-based nonprofits, faith based organizations, community development corporations, and community residents. Today, our work is focused on addressing the social determinants of health along the Health Impact Pyramid, developed by the U.S. Centers for Disease Control & Prevention, using the following three approaches:

- ***Building and sustaining multi-sector coalitions in Charlestown, Chelsea, Revere, and East Boston to change policies and systems with a focus on preventing and reducing substance use disorders and obesity***
- ***Developing the assets of almost 1,000 Boston, Chelsea, and Revere public school students by offering opportunities in STEM***
- ***Improving access to care for vulnerable patients through community health workers, navigators, home visitors, and others***

MGH's investment in this work runs deep. We invest more than $15 million in community programs, not accounting for the new substance use disorder initiative (annualized at about $2 million) or the contributions of clinical departments. In total and according to the Massachusetts Attorney General's definition, MGH's investment in community benefits is 5.4% of patient care related expenses. An additional $2 million in grants and gifts is also raised to supplement, never supplant, our ongoing investment to the community. The work is designed to build community and health system capacity, leadership, and to change policies and systems, all of which lead to sustainability.

Purpose of the 2016 Community Health Needs Assessment

In 2015, MGH CCHI conducted its triennial Community Health Needs Assessment (CHNA), which found many of the same concerns as the 2012 CHNA (see previous Community Health Needs Assessment reports). MGH CCHI identified three reasons to conduct another CHNA on the heels of the 2015 assessment.



Source: Quality of Life Survey, MGH CCHI, 2012 & 2015

1. A Growing Concern

The 2015 CHNA identified an increased concern in our communities around adolescent substance use and mental health issues. A goal of that implementation plan was to further explore the reasons associated with this concern.

2. The Benefit of a Regional Approach with Coalitions

The MGH CCHI is the backbone organization for four multi-sector community coalitions in the cities of Revere and Chelsea, as well as Charlestown and East Boston, two neighborhoods of Boston. All four coalitions have a focus on changing policies, systems, and the environment to prevent or intervene early on in substance use disorders. With the hypothesis that youth across these communities are experiencing the same factors that cause substance use and mental health issues, the assessment took a regional approach so the coalitions could work together to employ strategies, thus making a larger impact.

Additionally, as the communities are contiguous, many of the coalitions partner with the same organizations, working across community borders. This provided a seamless way to conduct the assessment as well as an opportunity to identify common strategies.

The four coalitions were an integral part of carrying out the assessment (see Appendix A) and will be responsible for creating work plans with their respective communities to implement the strategies prioritized through this process.

3. Greater Impact by Aligning with Other Boston Hospitals

There are many hospitals in the Boston area, most of which must also complete a CHNA every three years. MGH is a member of the Conference of Boston Teaching Hospitals (COBTH) and several years ago, through COBTH's Community Benefits Committee, committed to working together on community health needs assessments. The hospitals recognized that in many instances they were assessing the needs of the same neighborhood(s) and there would be real benefit, for both the hospitals and the community, to working together. MGH was on a CHNA schedule that differed by one year from most COBTH hospitals. Thus, by conducting a CHNA in 2016, MGH is now on the same schedule as other Boston teaching hospitals. The goal is that by conducting the CHNAs together, the hospitals can identify one to two common areas on which to work. By selecting common issues and strategies, COBTH hospitals could potentially have a greater impact on the Boston area.

A Note about data in this report

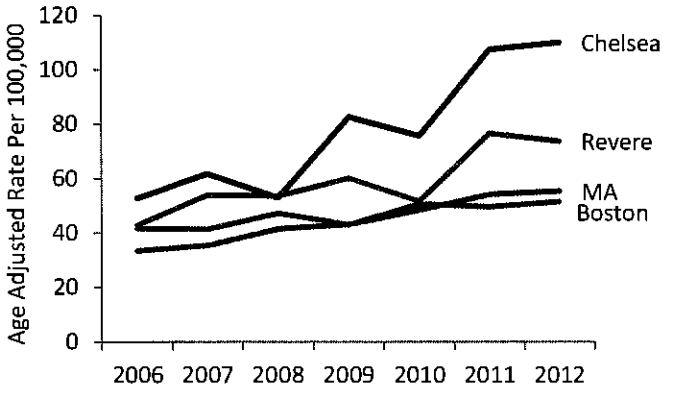
Data in this report are from three main sources: Massachusetts Department of Education, Massachusetts Department of Public Health MassCHIP database, and the Youth Risk Behavior Survey (YRBS) for each community. Due to processes beyond our control, data can be a few years old, and data specific to neighborhoods of Boston are difficult to obtain. In Revere and Chelsea, YRBS is collected every two years in both the middle and high school populations. In Charlestown, it is only collected on middle students every two years. For East Boston, 2015 was the first year we were able to collect data from the East Boston High School. Data presented are the latest available.

The Data: Adolescent Mental Health and Substance Use

Adolescent substance use and mental health issues were identified as a growing concern in the 2015 assessment, and a plan was made to better understand the contributing factors. As a result, quantitative data were gathered and analyzed more closely.

Data from the Massachusetts Department of Public Health indicate that adult hospitalizations and mortality associated with mental health disorders are significantly higher in Chelsea and Revere than in Boston or Massachusetts overall, indicating an opportunity to go upstream and work to prevent these issues before they become so serious.

Adult Mental Disorder Mortality



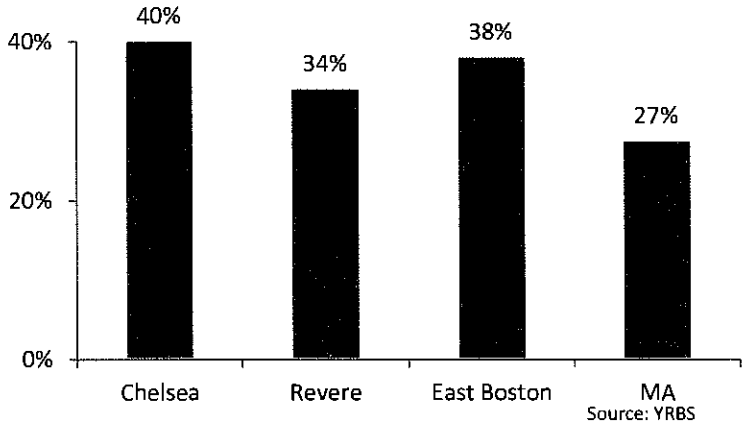
Source: MassCHIP

Adult Mental Disorder Hospitalization

Source: MassCHIP

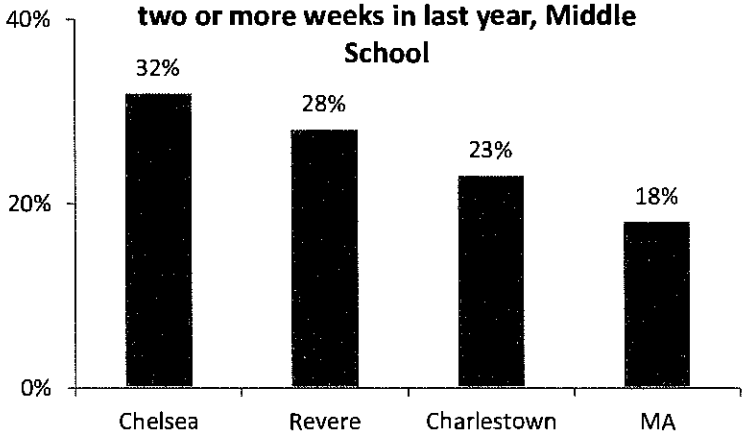
Responses to questions on the Youth Risk Behavior Survey (YRBS) indicated young people feeling depressed at significantly higher rates in Chelsea, Charlestown, East Boston, and Revere than in the state overall. Suicidality, particularly in middle school youth, raises serious concern.

Youth reporting feeling sad or hopeless for two or more weeks in last year, High School



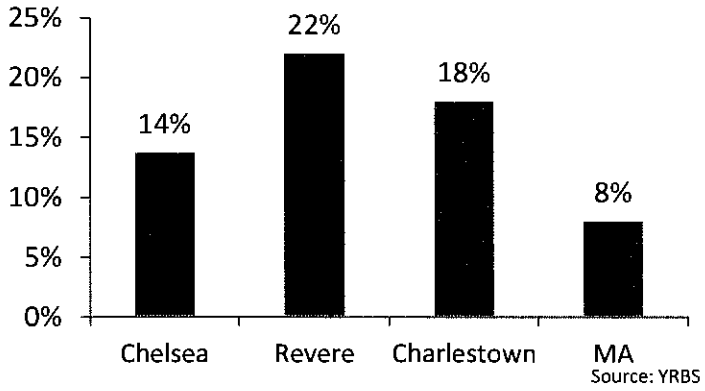
Source: YRBS

Youth reporting feeling sad or hopeless for two or more weeks in last year, Middle School



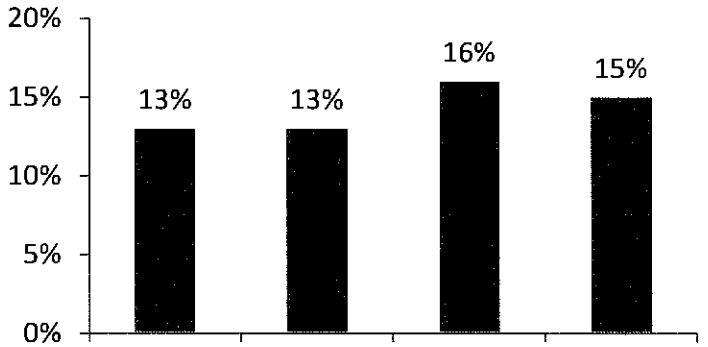
Source: YRBS

Seriously Considered Suicide in the Past Year, Middle School



Source: YRBS

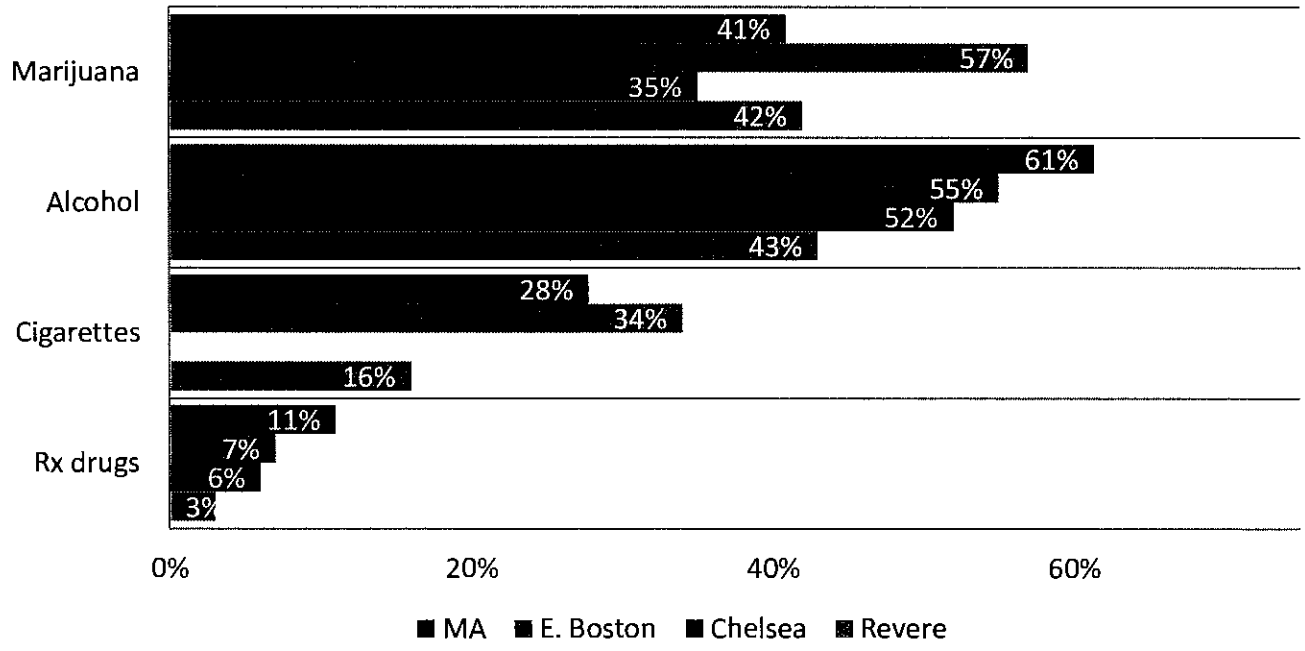
Seriously Considered Suicide in the Past Year, High School



Source: YRBS

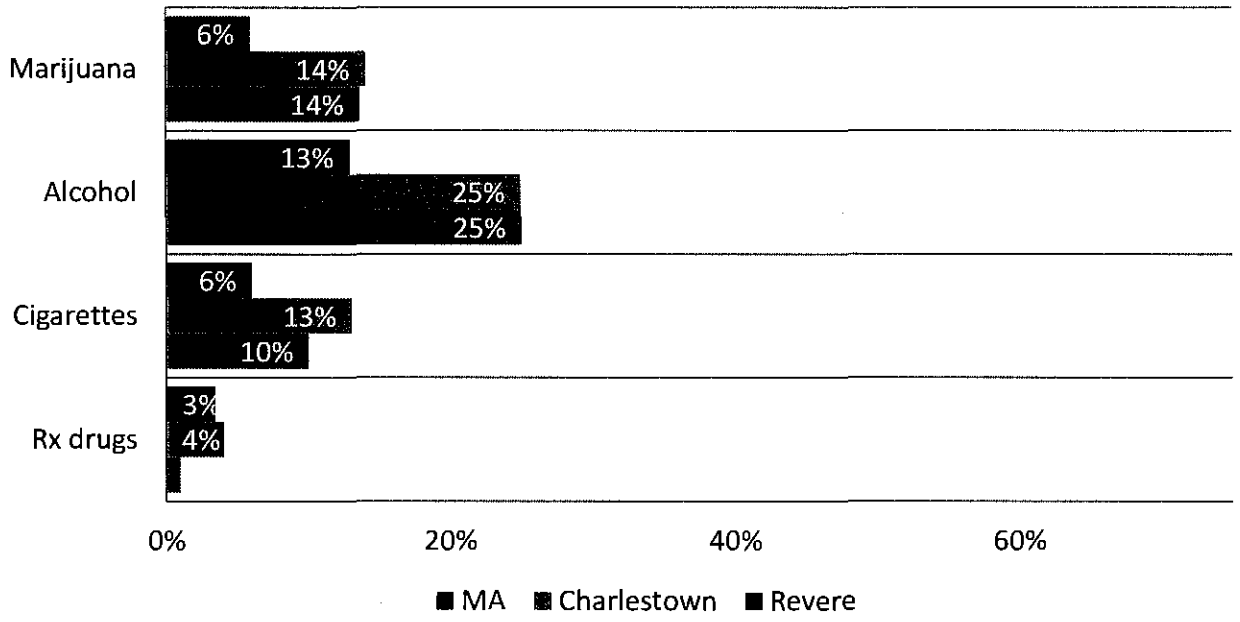
Regarding substance use, high school students are at or below the state for the most common substances, with the exception of marijuana and cigarettes in East Boston. A key factor is most likely the work of the MGH-supported community coalitions to reduce teen substance use. Twenty years ago, Revere had rates of teen substance use, particularly alcohol, far above the state average. Reports of both lifetime and current substance use for middle school youth, however, are significantly higher than state rates. Given the severity of the opioid epidemic in these communities, which usually begins in the late teens, coupled with the increase in mental health issues and suicidality in middle school youth, communities are even more committed to focusing on prevention and early intervention.

Lifetime Youth Substance Use, High School



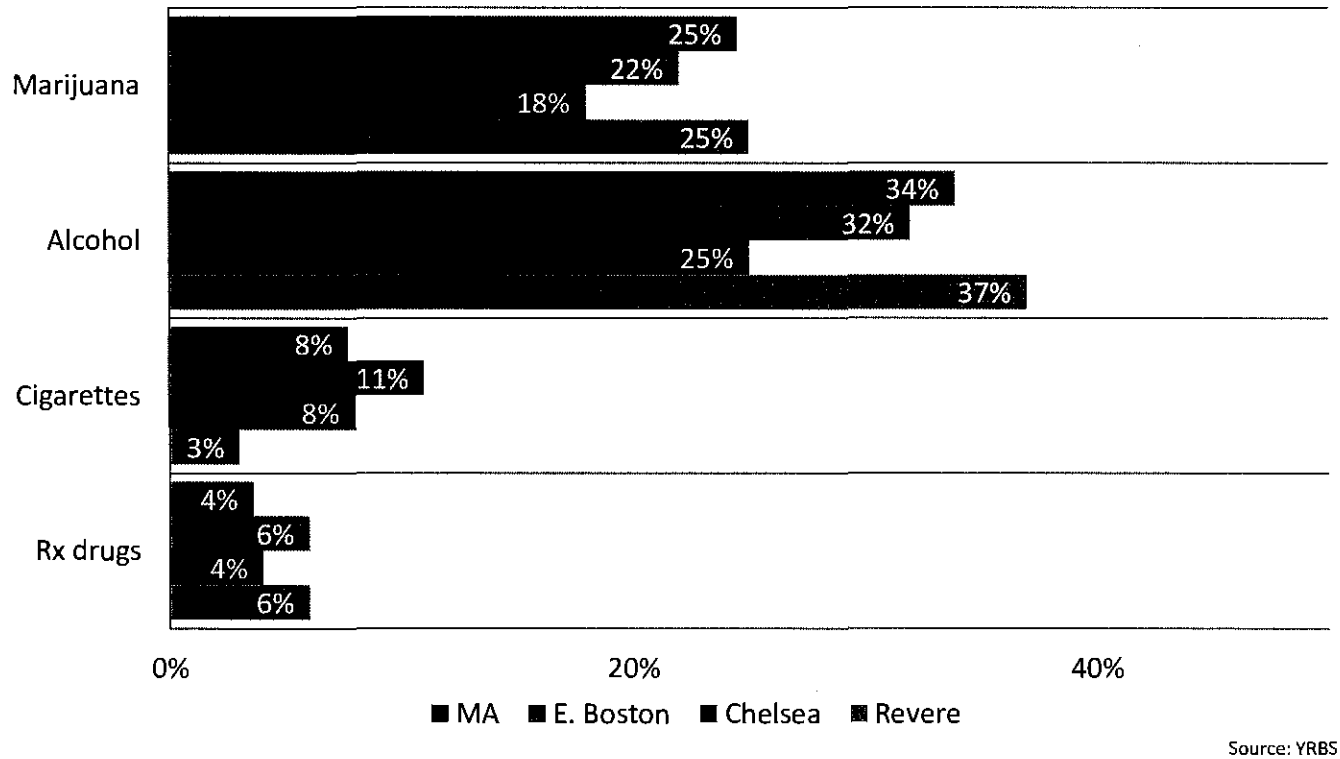
Source: YRBS

Lifetime Youth Substance Use, Middle School

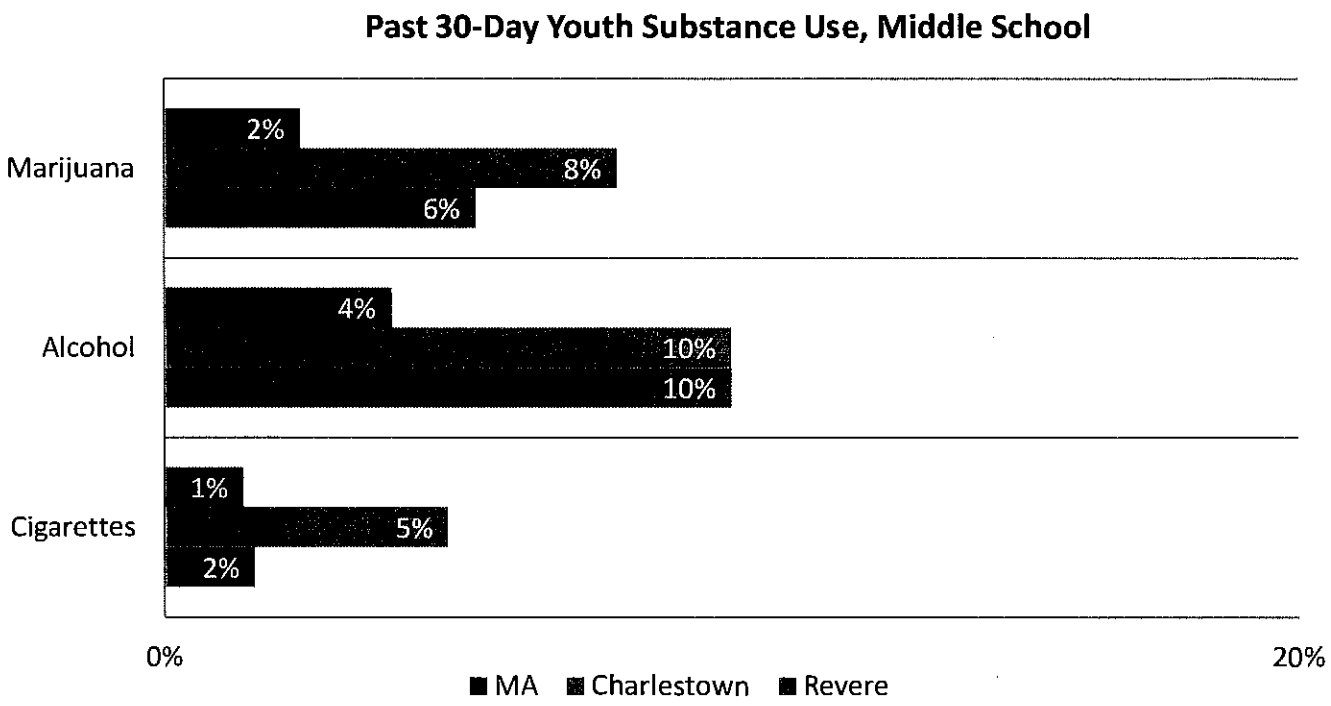


Source: YRBS

Past 30-Day Youth Substance Use, High School



Source: YRBS


Past 30-Day Youth Substance Use, Middle School
Marijuana
2%
8%
6%
Alcohol
4%
10%
10%
Cigarettes
1%
5%
2%
0%
20%
MA
Charlestown
Revere

Source: YRBS

Factors Associated with Adolescent Substance Use and Mental Health Issues

Risk and Protective Factors are a common language among public health experts. A protective factor can be defined as "a characteristic at the biological, psychological, family, or community (including peers and culture) level that is associated with a lower likelihood of problem outcomes or that reduces the negative impact of a risk factor on problem outcomes." Thus, a risk factor would contribute to problem outcomes. The following table contains the most widely recognized risk and protective factors that contribute to youth using substances and mental health issues.

Risk Factors	Protective Factors
Chaotic Home environment	Strong Family bonds
Ineffective parenting	Parental engagement in child's life
Little mutual attachment and nurturing	Clear parental expectations and consequences
Inappropriate, shy, or aggressive classroom behavior	Academic success
Academic Failure	Strong bonds with adults & pro-social institutions
Low academic aspirations	Conventional norms around drugs and alcohol
Poor social coping skills	
Affiliations with deviant peers	
Perceived external approval of drug use (peer, family, community)	
Parental substance use or mental illness	

Source: SAMHSA, 1997

There were specific risk and protective factors associated with substance use and mental health issues among young people that our communities chose to focus on. The following pages will review each factor and the supporting data.

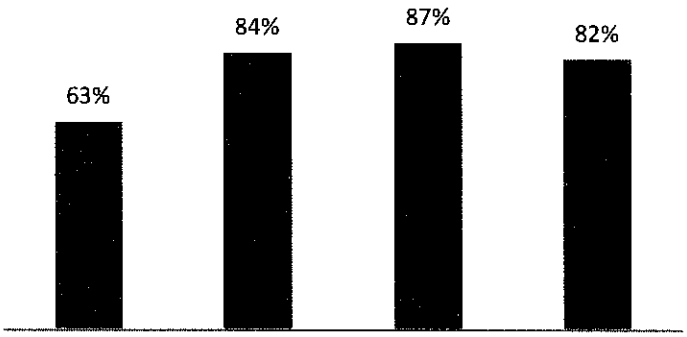
These data on risk and protective factors were gathered from secondary sources, such as the YRBS, as well as primary data collection through interviews and focus groups. Over 200 individuals participated in the CHNA to indentify these factors as well as the strategies to address them. See Appendix A for more in-depth methodology.

Research suggests that young people thrive and flourish when there is one or more caring adult in their lives (Scales, P. C., & Leffert, N., 1999).

Positive Relationships with Adults

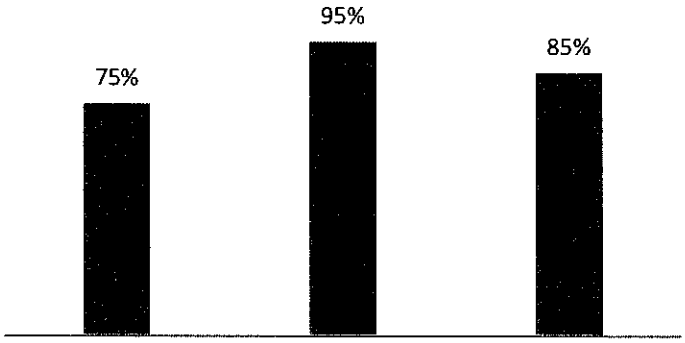
When young people in our focus groups were asked to whom they turn in times of stress, they often mentioned an adult in their lives. This was most often a parent, but teachers, counselors, and coordinators of clubs or after school activities were also mentioned. As seen below, the data on positive adult relationships is favorable for our communities. This is a strength that the implementation plan can harness and build upon.

Youth have at least 1 adult (family or non-family) to talk to, High School

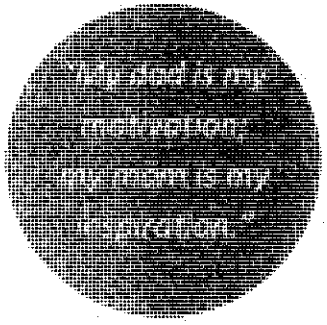


Source: YRBS

Youth have at least 1 adult (family or non-family) to talk to, Middle School

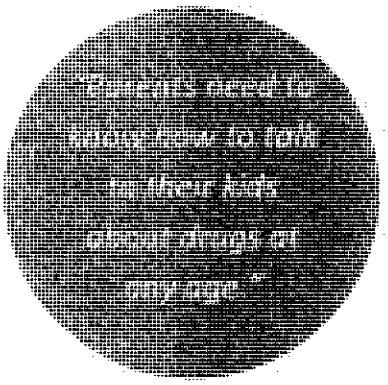


Source: YRBS



When talking to medical doctors, mental health professionals, social workers, school personnel, and other people who work with youth, many also acknowledged the importance of trusting adults in the lives of young people. Since this is a strength in these communities, there is a base to build upon. There is opportunity to build the skills of adults to work with youth, formally or informally, and to increase the number and effectiveness of adults working with youth. This is especially essential for new immigrant youth resettling in MGH communities, many of whom have experienced trauma in the immigration process, a major risk factor for depression and substance use.

For those who use substances or have mental health issues, the absence of positive relationships with an adult was identified as a risk factor. Qualitative data suggest that without adults to turn to in times of need to help problem solve, adolescents might turn to substances to self-medicate, most often marijuana and prescription drugs.



Parental & Peer Disapproval of Substance Use

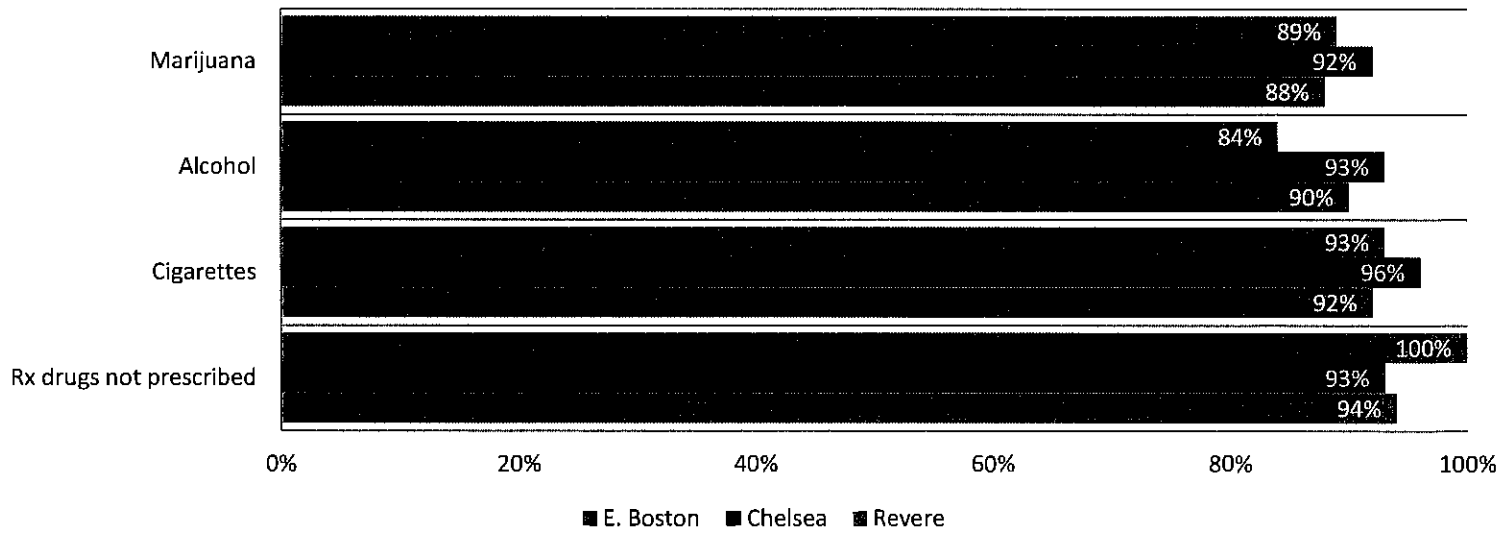
In interviews and focus groups with professionals who work with youth and family members of those in recovery, participants identified parents' inability to talk to their children about substances as a major factor contributing to adolescent substance use. Not knowing what to say, how to say it, or at what age to start was confusing for parents. Many reported that parents feel they have no control over their children beyond a certain age, and just "throw their hands up."

Additionally, interviewees reported that many young people live in households where family members might be using alcohol and marijuana, and they are getting mixed messages about what is harmful, allowed, or normalized.

Parental disproval is a strong predictor of drug use intentions (Sawyer, T.M., & Stevenson, J.F., 2008).

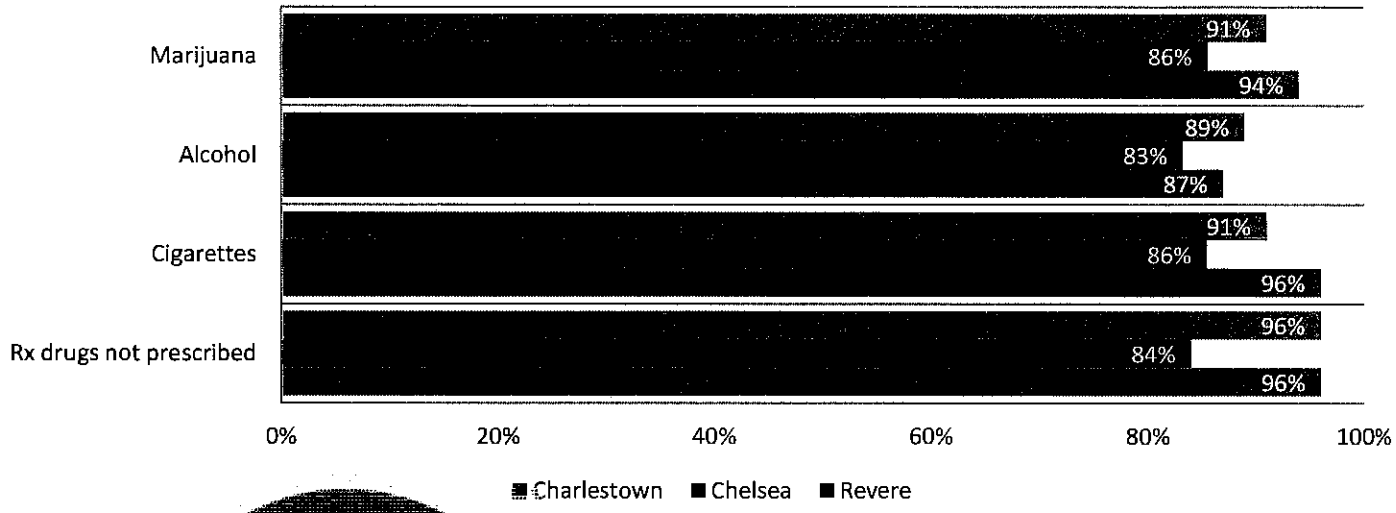
Research suggests that as young people move from middle to high school, peers also have a strong influence on what behaviors youth might engage (Sawyer, T.M., & Stevenson, J.F., 2008). The youth participants in the focus groups reported that marijuana is pervasive and "everyone is doing it." They agreed that there was pressure to smoke marijuana to fit in. However, as seen in the Past 30-Day Use graph above, it does not appear from the quantitative data that everyone is smoking marijuana. Parsing out facts from perception will be key in moving forward among the coalitions when developing strategies in these communities.

Perceived Parental Disapproval: Wrong or Very Wrong to Use Substances, High School

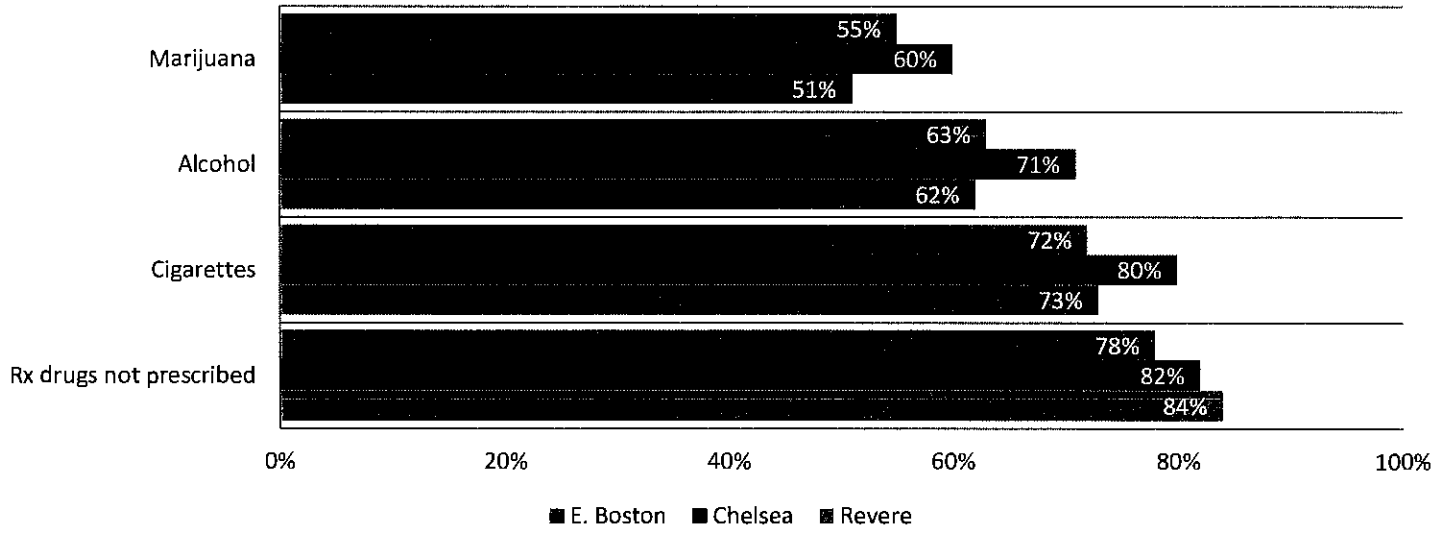


Source: YRBS

Perceived Parental Disapproval: Wrong or Very Wrong to Use Substances, Middle School

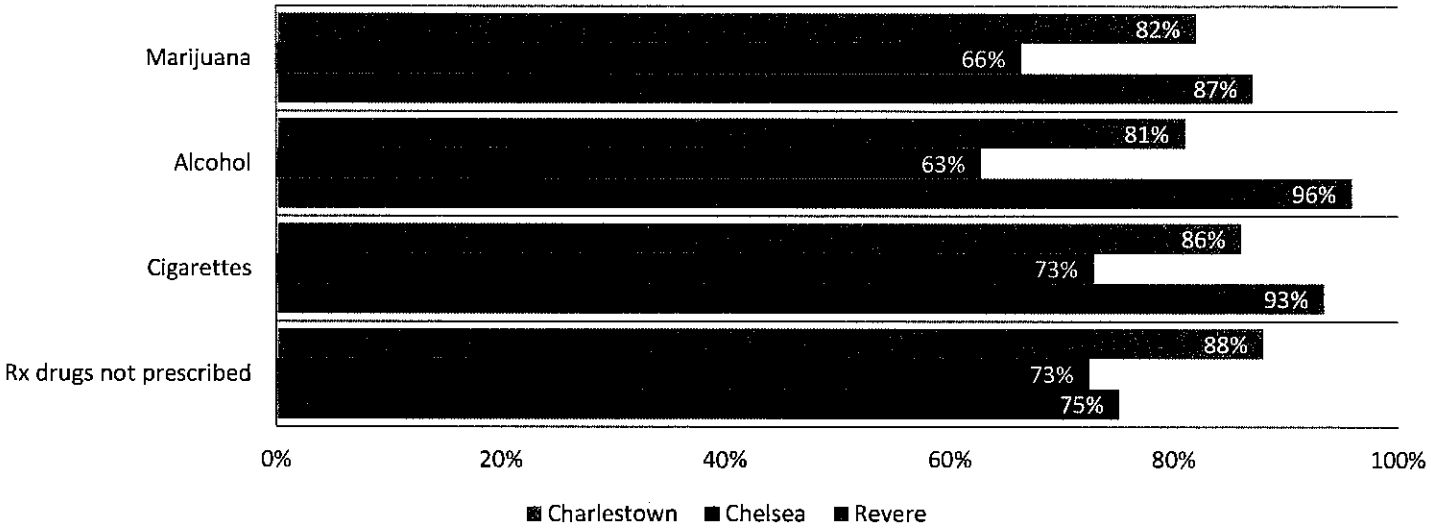


Perceived Peer Disapproval: Wrong or Very Wrong to Use Substances, High School



Source: YRBS

Perceived Peer Disapproval: Wrong or Very Wrong to Use Substances, Middle School



Source: YRBS

From the data above, young people perceive that their parents disapprove more of their using substances than their peers. For high school students, peers are less likely to disapprove of marijuana use than any other substance. In fact, they are more likely to disapprove of alcohol and tobacco, which might contribute to the perception that smoking marijuana is pervasive among young people.

Several studies have found that adolescents who are more likely to be without adult supervision after school have significantly higher rates of alcohol, tobacco, and marijuana use than do adolescents receiving more adult supervision (Mulhall et al. 1996; Richardson et al. 1993).

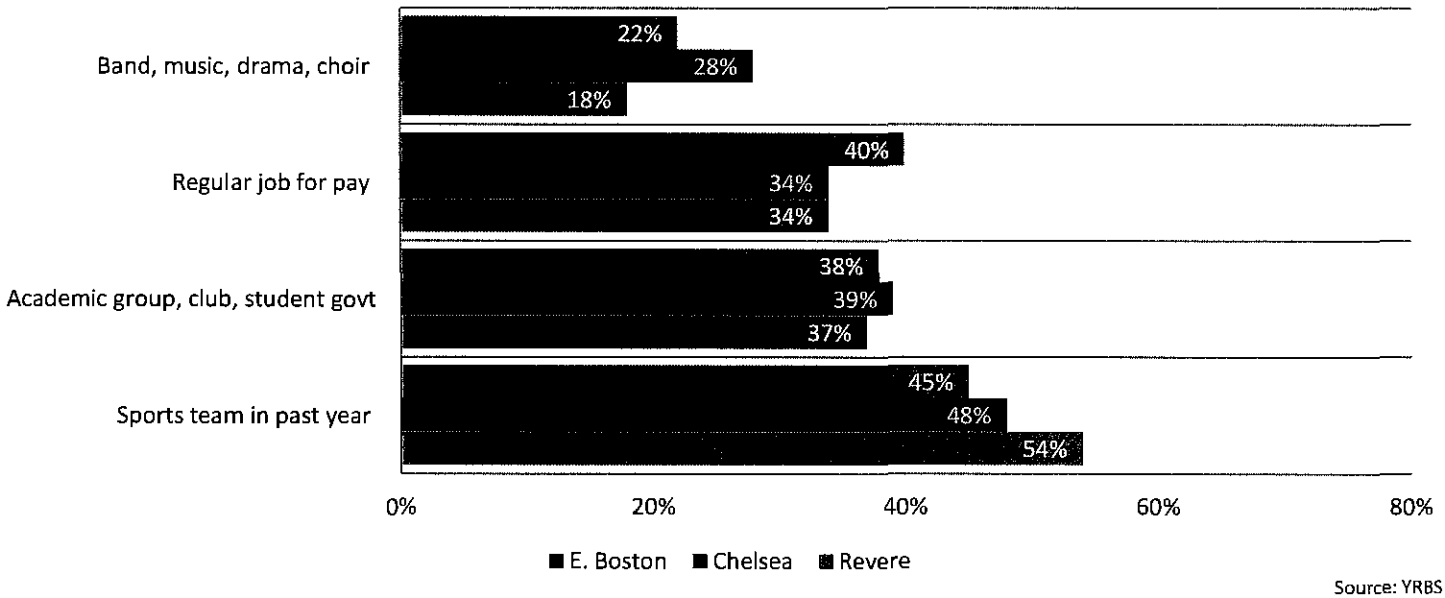
Accessible Extracurricular Activities

Mentioned overwhelmingly in all focus groups and interviews was the need for healthy, pro-social activities and experiences which would keep young people safe and engaged, while reducing negative emotions and isolation. Participants reported that of the out-of-school activities offered, many were expensive, at capacity, or transportation was not readily available.

Many youth, particularly those who participated in the focus groups through the Boys and Girls Clubs or another after school program, reported that the program gave them a safe place to engage with adults and peers. Youth at the Boys and Girls Clubs reported going to the club directly after school and staying there through the evening until a parent or family member picked them up. Unfortunately, not all of our communities have a Boys and Girls Club or comparable organization.

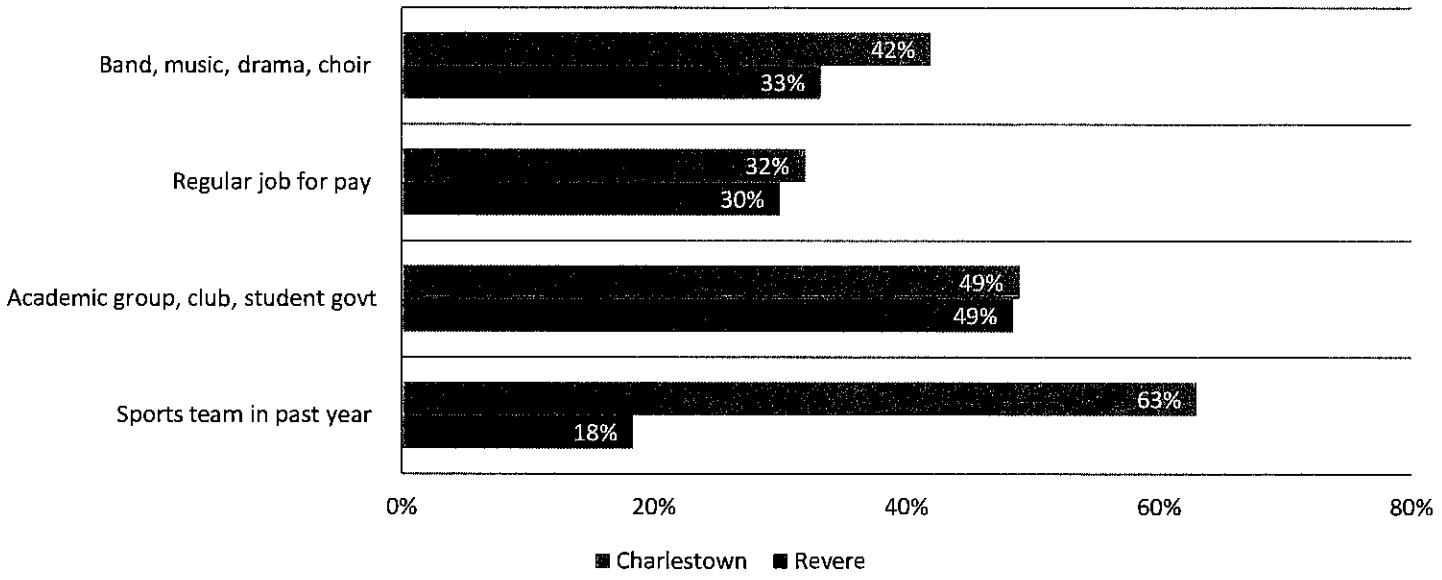
Professionals reported the need for activities to help youth with aggression, refusal skills, positive interactions with adults, and to help build job and vocational skills. Youth reported they want jobs, which would give them something to do, money (for themselves or family), and help build their resumes.

Student Participation in Extracurricular Activities in Past Year, High School



Source: YRBS

Student Participation in Extracurricular Activities in Past Year, Middle School



Source: YRBS

Older youth also reported wanting internships and help with college prep, including financial aid and financial literacy.

Access to Substances

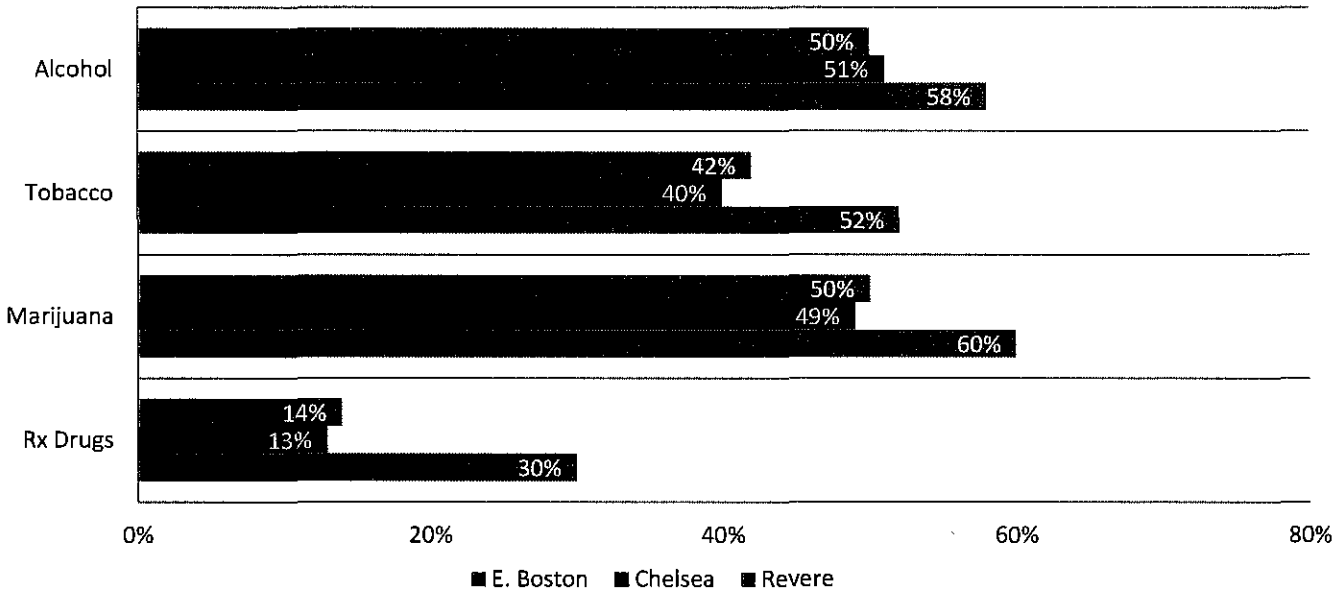
Youth are more likely to use substances that they perceive as easy to obtain (King, K.A, Vidourek, R. A., Hoffman, A.R., 2012).

"Marijuana is easier to get than alcohol; I don't have to get an adult to buy it for me." This sentiment was pervasive among the youth focus group participants, and many professionals also agreed that for adolescents, marijuana is the drug of choice and very easy to obtain. This is confirmed in the data below from the Youth Risk Behavior Survey where youth in all communities report that marijuana is almost as easy, if not easier, to get than alcohol.

Professionals reported that youth are getting marijuana from friends, dealers, or stealing it from their parents.

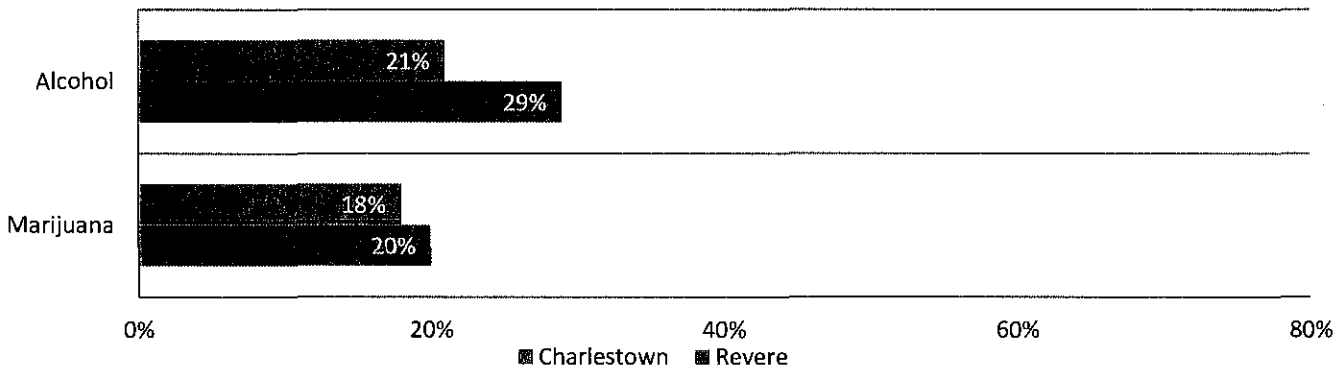
Young people also identified prescription drugs as easy to get, although more prevalent among older adolescents.

Perception of Ease of Obtaining Substances— Fairly or Very Easy, High School



Source: YRBS

Perception of Ease of Obtaining Substances— Fairly or Very Easy, Middle School



Source: YRBS

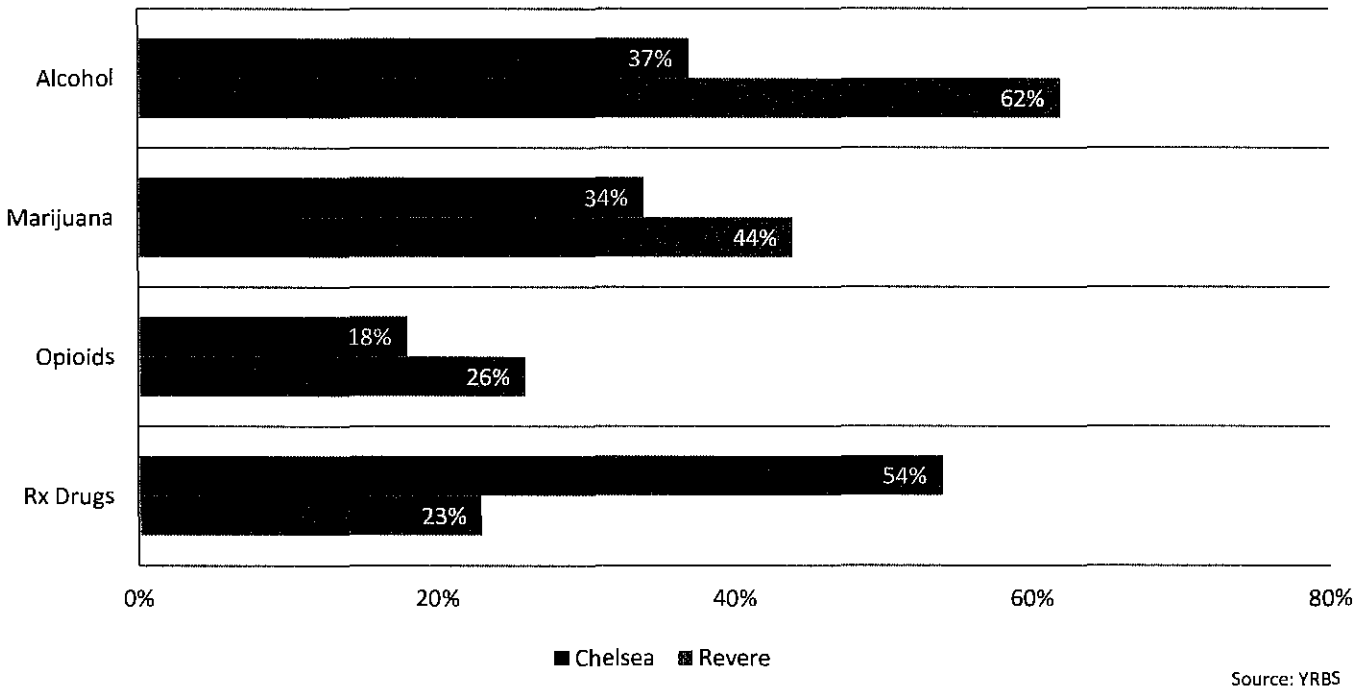
Youth are more likely to use substances that they perceive as less harmful (King, K.A, Vidourek, R. A., Hoffman, A.R., 2012).

Perception of Harm from Substances

Youth are getting mixed messages about the dangers of marijuana; as legislation changes, youth do not see marijuana as illegal or dangerous and think it is socially acceptable. When asked what drugs they know people use, youth seemed to dismiss marijuana and not think it was a big deal. "Marijuana is more casual now, like smoking a cigarette." As the data below show, about one-third of the youth perceive marijuana to be of little or no risk. Of even greater concern is the proportion of youth who report opioid or prescription drugs as having little or no risk.

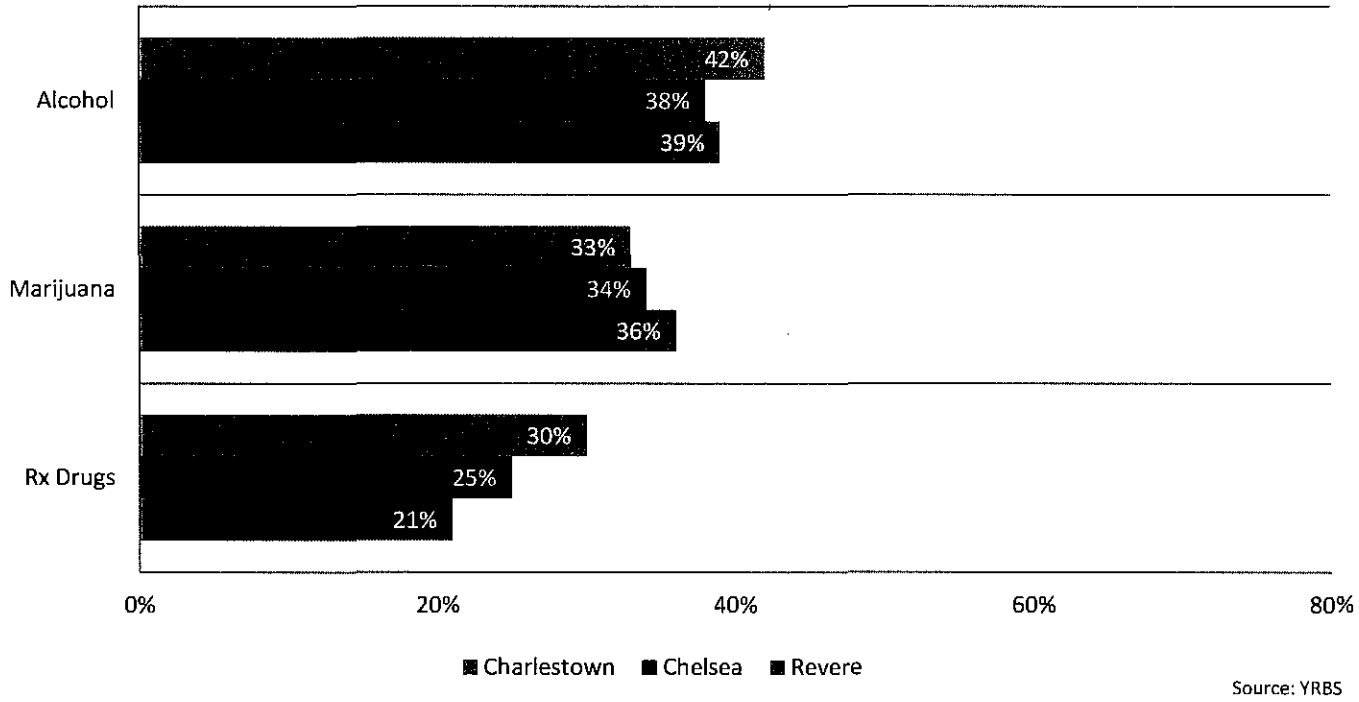
Even the professionals interviewed were confused about what to say in terms of use and harms of substances, especially around marijuana and prescription drugs, as those can be prescribed by a doctor and are viewed as helping people.

Perceived Risk of Substance Use—No or Small Risk, High School

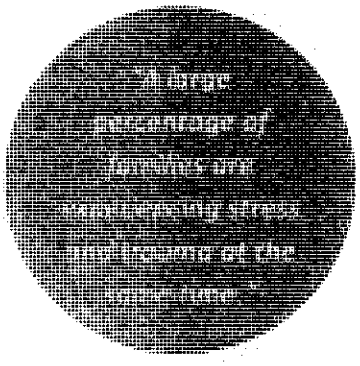


Source: YRBS

Perceived Risk of Substance Use—No or Small Risk, Middle School



Source: YRBS



Stress

When asked what stresses them out, youth promptly listed school, peer pressure and fitting in, personal safety, bullying, and homework.

The pressure to do well in school was mentioned in all youth focus groups. Many reported that this pressure might lead to depression and using drugs, especially if a youth does not have someone to talk to. Some youth admitted to using marijuana in the mornings before school, "to take the edge off." Additionally, youth want to fit in, so they succumb to peer pressure to smoke marijuana or take pills with friends. Youth admitted they are not sure how to positively deal with stress and that talking to mental health counselors can lead to being labeled as "crazy."

Bullying in school and on-line are very real stressors as well. Youth reported they see it happen more often in middle school, and bullying can lead to depression and suicide.

Younger youth and young women in the focus groups mentioned a fear of safety when out in their communities, especially after dark. Professionals agreed that many youth do not feel safe in their

communities after dark, and this limits opportunities for activities that might run late, causing stress for youth who need to leave a program before sunset.

Having a current diagnosis for depression is associated with increased risk of prescription opioid misuse (Ford,& Rigg, 2015).

Professionals reported they see many youth dealing with family trauma, especially families in Chelsea, Revere, and East Boston where there has been an increase in unaccompanied minors from Central America. These youth have experienced multiple traumas, including violence while crossing the border and having to live with unknown family members. Some youth reported being worried that their parents or family members might be deported. Additionally, some youth are approached by gang members and pressured to join gangs that are associated with their home countries.

This stress can lead to depression, other mental health issues, and drug use.

Summary of Factors that Prevent Adolescent Substance Use and Mental Health Issues:

Positive Relationships with Adults
Parental & Peer Disapproval of Substance Use
Accessible Extracurricular Activities
Lack of Access to Substances
Perception of Harm from Substances
Reducing & Managing Stress

Prioritization of Factors to Address in Prevention Strategy

Presentations of the above factors took place with each community coalition, as well as any organizations who requested a presentation, including the Community Health Improvement Team at MGH Chelsea HealthCare Center. Participants at each presentation were divided into groups to prioritize the factors for their communities. Prioritization was based on the importance of the factor to the community and how changeable the factor was, given the readiness and resources of the community.

To help prioritize, participants were given the following grid to use and asked to discuss amongst themselves how they viewed each factor in the context of their community.

Prioritization Matrix		Changeability	
		High	Low
Importance	High		
	Low		

Each group reported out what factors ended up as both High Importance and High Changeability. Factors were tallied, and agreement was sought from the group that the prioritized factors were indeed the ones the communities wanted to work on.

Not surprisingly, as the factors are similar across Revere, Chelsea, Charlestown, and East Boston, so, too, were the top prioritized factors from each community.

Below are the prioritized factors from each presentation.

Revere Cares	Healthy Chelsea	The Charlestown Coalition	EASTIE Coalition	MGH Chelsea CHI Team	MGH CCHI Coalition Staff
Adult Relationships	Adult Relationships	Adult Relationships	Adult Relationships	Adult Relationships	Adult Relationships
Extracurricular Activities	Extracurricular Activities	Extracurricular Activities	Extracurricular Activities	Extracurricular Activities	Extracurricular Activities
Stress	Stress	Perception of Harm from Substances	Perception of Harm from Substances	Perception of Harm from Substances	Stress

Factors to be addressed by MGH CCHI & Coalitions:

Adult Relationships

Extracurricular Activities

Stress

Perception of Harm from Substances

Strategies & Next Steps

Participants were then asked to review each prioritized factor and consider strategies that they could implement across the region. Participants were asked to take into account feasibility, reach and populations affected, and buy-in when considering strategies. Below are the overall strategies to address the prioritized factors for adolescent substance use and mental health.

Between October 1, 2016, and December 31, 2016, the MGH CCHI Coalitions will work together to create a three year work plan to implement these strategies.

Factor	Strategy
Adult Relationships	Increase job shadowship programs and youth jobs
	Enhance adult capacities for informal and formal mentorships and communication with youth
Extracurricular Activities	Build infrastructure to connect youth and families to activities
	Collaborate with organizations to advocate for age-appropriate youth activities in each community
	Strengthen youth component of each community coalition
Stress	Increase coping skills of youth and adults to positively manage and reduce stress
	Create youth photo voice project to highlight positive stress management
Perception of Harm from Substances	Implement social marketing campaign to increase perception of harm of adolescent marijuana use
	Collaborate with schools and organizations to incorporate an evidence-based curriculum that addresses substance use and mental health

Appendix A: Methodology

This CHNA includes both quantitative and qualitative data sources. Quantitative data from the 2015 Youth Risk Behavior Survey (YRBS) and the Quality of Life Survey from the 2015 CHNA were gathered and reviewed, in addition to community data from sources such as the Boston Public Schools, the American Community Survey, and the Massachusetts Department of Public Health. Data from these sources were utilized to create data placemats that visually depicted community-specific demographic information, educational attainment, poverty rates, and substance use and mental health indicators. The data placemats were brought to interviews and focus groups to provide community context and frame conversations about adolescent substance use and mental health with both professional and youth participants.

Qualitative data were collected through interviews and focus groups. Interview and focus group guides were created for facilitators and note takers with standard questions for both professional and youth participants. CCHI coalition staff reviewed initial questions in February and provided feedback. After the interview and focus group guides were finalized in March, CCHI evaluators traveled to each community to facilitate data collection with coalition staff.

Coalition staff identified focus group and interview participants from relevant community and youth groups, as well as organizations who work with youth in schools, health centers, and non-profit organizations. A total of 19 focus groups and 8 interviews were completed between April and June with a combined total of 235 professionals, young people, people in recovery, and families of people in recovery across Charlestown, Chelsea, Revere, East Boston, and Roxbury. Each interview/focus group lasted approximately 45 to 60 minutes. Youth participants received a $20 gift card at the end of the focus groups as compensation for their participation.

During interviews and focus groups, participants were asked about substance use and mental health among adolescents, as well as the strengths and available resources in their communities. Upon completion of all focus groups and interviews, the notes were reviewed and categorized to identify common themes regarding substance use and mental health among youth across all communities, particularly to inform risk and protective factors associated with adolescent substance use and mental health issues.

The next page summarizes the interviews and focus groups conducted.

Interview/Focus Group	Type	Who	Number of Participants
Interview	Professional	East Boston High School Nurse	1
Interview	Professional	Clinical Director, Youth Connect	1
Interview	Professional	Social Worker at Seacoast Alternative School, Revere	1
Interview	Professional	Nurse Practitioner, Revere School Based Health Center	1
Interview	Professional	Community Based Clinician, North Suffolk Mental Health	1
Interview	Professional	Social Workers at Garfield Middle School, Revere	2
Interview	Professional	Superintendent, Revere Schools	1
Interview	Professional	Administrative Director of Mental Health & Mental Health Clinician at School Based Health Center, East Boston	2
Interview	Professional	Medical Director, MassGeneral Hospital for Children	1
Focus Group	Professional	Charlestown Child Team	10
Focus Group	People in Recovery	Young Adults in Recovery, Charlestown	7
Focus Group	Youth	Turn it Around Basketball Tournament Participants	75
Focus Group	Professional	Family Support Circle Task Force, Charlestown	4
Focus Group	Professional	Chelsea High School Social Workers	5
Focus Group	Professional	Chelsea School Based Health Center Staff	4
Focus Group	Youth	Chelsea Boys and Girls Club	7
Focus Group	Youth	Roca Participants, Chelsea	12
Focus Group	Professional	Roca Staff, Chelsea	5
Focus Group	Youth	REACH, Chelsea	10
Focus Group	Professional	Behavioral Health Staff, MGH Chelsea	20
Focus Group	Youth	Salesian Boys & Girls Club Middle School Boys, East Boston	6
Focus Group	Youth	Salesian Boys & Girls Club Teen Girls, East Boston	6
Focus Group	Youth	Salesian Boys and Girls Club Teen Boys, East Boston	10
Focus Group	Families of those in Recovery	North Suffolk Mental Health Support Group, East Boston	20
Focus Group	Youth	Yawkey Boys and Girls Club Young Men	14
Focus Group	People in Recovery	Recovery Community in Revere	6
Focus Group	Youth	Seacoast High School Students, Revere	5
Focus Group	Professional	North Suffolk Mental Health Staff	4

Appendix B: References

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Attachment/Exhibit

C

CHNA/CHIP Self-Assessment Form Cover Page

As discussed within the Community Health Initiative ("CHI") Narrative and approved by Mr. Ben Wood at the Department of Public Health, Massachusetts General Hospital and its Community Advisory Board will utilize the 2019 community health needs assessments ("CHNAs") and community health improvement plans ("CHIPs") developed by the Boston CHNA-CHIP Collaborative and the North Suffolk Public Health Collaborative to determine the Health Priorities and Strategies for the Determination of Need ("DoN") – CHI.

However, prior to participating in these CHNAs with these Collaboratives, the Massachusetts General Hospital – Center for Community Health Improvement staff completed the attached CHNA/CHIP Self-Assessment Form based on the Hospital's previous CHNAs (developed in 2015 and 2016). Consequently, Mr. Wood requested that we submit this Form with the Determination of Need application.

Attachment/Exhibit

D

Addendum Revised Community Engagement Plan Form

Section 3: Please briefly describe your overall plans for the CHI engagement process and specify how this effort will build off of the CHNA/CHIP community engagement process as is stated in the *Determination of Need ("DoN") Community -Based Health Initiative Planning Guideline.*

The Massachusetts General Hospital's Trustee Committee on Community Health ("MGH Trustee Committee") advises the Hospital, as well as the MGH – Center for Community Health Improvement ("CCHI") leadership on focal points of community health. The MGH Trustee Committee is tasked with: (1) Reviewing and approving the Community Health Needs Assessment ("CHNA") and Community Health Improvement Plan ("CHIP") processes and their results; (2) Advising on strategies and programming; (3) Serving as ambassadors of the Hospital's community health agenda within MGH, as well as local communities; and (4) Where appropriate, assisting with the identification and cultivation of funding opportunities.

MGH's Community Advisory Board ("CAB") works with Joan Quinlan, MPA, Vice President for Community Health at MGH and Leslie Aldrich, Executive Director of CCHI at MGH. Ms. Quinlan and Ms. Aldrich report to the MGH Trustee Committee on the progress of the CAB with Determination of Need ("DoN") – Community Health Initiatives ("CHIs"). In general, the CAB is tasked with reviewing the DoN sub-regulatory guidelines, outlining roles and responsibilities for the group, and reviewing past CHNAs and CHIPs to determine health priorities for DoN – CHIs. For this DoN – CHI, the CAB will be responsible for selecting the health priorities and strategies for the Hospital.

Moreover, MGH has an Executive Committee on Community Health ("ECOCH"). ECOCH is tasked with promoting community health improvement and ensuring health equity. ECOCH leverages the four components of MGH mission's: (1) patient care, (2) teaching, (3) research and (4) community health to address community health improvement. To improve health across populations and ensure race equity, ECOCH has a focus on social and economic determinants of health, access to care for low-income patients and collaborating with MGH's Diversity and Inclusion Committee around issues of race and racism.

MGH also places an emphasis on community engagement through community coalitions. Within MGH's target communities of Charlestown, East Boston, Revere & Chelsea, CCHI serves as the backbone to four multi-sector coalitions using a collective impact framework. Hospital staff work in the noted communities and convene local stakeholders, as well as community residents in assessing the health needs of the communities and developing programmatic solutions. In these instances, CCHI acts as a community convener and facilitator, implementing best practices, providing evaluation support, and accessing a range of resources in the community to ensure accurate processes.

For its next CHNA, MGH is partnering with other members of the Conference of Boston Teaching Hospitals ("COBTH"), as well as other healthcare providers and organizations to conduct two comprehensive and collaborative CHNA/CHIP processes. The first process will be conducted by the Boston CHNA-CHIP Collaborative ("Collaborative") and the second process is being carried out by the North Suffolk Public Health Collaborative ("North Suffolk").

Boston CHNA-CHIP Collaborative

The Boston CHNA-CHIP Collaborative comprises a number of stakeholders, including community organizations, health centers, hospitals and the Boston Public Health Commission. This group was formed to undertake the first city-wide CHNA and CHIP for the City of Boston. This innovative Collaborative aims to achieve the benefits of broad partnership around a Boston-based CHNA and CHIP, including deeper engagement of key community and organizational stakeholders; enhanced alignment of defined priorities and strategies; maximum allocation of resources; coordination of implementation strategies for collective impact and a healthier Boston.

To carry out robust CHNA and CHIP processes, the Boston CHNA-CHIP Collaborative has created a formal administrative infrastructure with a larger Steering Committee comprised of leadership from each participating organization. The Collaborative's Steering Committee provides strategic direction and policy for the CHNA-CHIP processes. Moreover, the Steering Committee manages work plans and the accountability of all work groups. The Operations Committee is charged with addressing issues within the CHNA-CHIP processes that require immediate attention and providing direction and oversight to administrative staff. The Collaborative also formed three sub-committees/work groups to the Steering Committee ("work groups"), including:

- Community Engagement Work Group: This work group is responsible for developing a sound community engagement strategy to assess the needs and resources of the various neighborhoods within Boston. This work group also is tasked with providing input on primary data collection methods, as well as providing support and logistics for primary data collection.

- Secondary Data Work Group: This work group is tasked with providing guidance on a secondary data approaches and indicators for the CHNA. This group also is responsible for fostering connections with key networks and groups to provide relevant data for the CHNA.

- Implementation Planning (CHIP) Work Group: Members of this work group are responsible for working with Health Resources in Action ("HRiA"), the Collaborative's third party evaluator and convener for the CHNA, to develop an overall CHIP that chooses effective policies and procedures and act on the health priorities that are important for Boston.

To ensure proper oversight of these processes, MGH's CAB, as well as the MGH Trustee Committee will be kept abreast of developments around the Boston CHNA-CHIP Collaborative's activities, strategies and work group progress by Joan Quinlan, who serves on the Boston CHNA-CHIP Steering Committee and is the Co-Chair for the Community Health Improvement Plan Work Group of the Boston CHNA-CHIP Collaborative, as well as Leslie Aldrich and Danelle Marable from CCHI, who also serve on various Boston CHNA-CHIP Collaborative work groups.

The vision of the Boston CHNA-CHIP Collaborative is "A healthy Boston with strong communities, connected residents and organizations, coordinated initiatives, and where every individual has an equitable opportunity to live a healthy life." To implement this vision, the Collaborative's Mission is "To achieve sustainable positive change in the health of Boston by collaborating with communities, sharing, knowledge, aligning resources and addressing root

causes of health inequities." The Collaborative will achieve this mission by engaging with the community to:

- Conduct a joint CHNA for Boston every three years discussing the social, economic, and health needs and assets in the community;
- Develop a collaborative CHIP for Boston to address issues identified as top priority and identify opportunities for shared investment;
- Implement efforts together (where aligned) and track individual organizational activities where appropriate;
- Monitor and evaluate CHIP strategies for progress and impact to continuously inform implementation;
- Communicate about the process and results to organizational leadership, stakeholders, and the public throughout the assessment, planning and implementation time period;
- Monitor and evaluate Collaborative structure and processes to continuously improve effectiveness and results.

Given these goals, as well as the required structure of the CHNA-CHIP processes outlined in the Department of Public Health's *Community Engagement Standards for Community Health Planning Guideline*, the Collaborative's CHNA will *access the needs and resources* of Boston's neighborhoods, *focus on what's important* through a prioritization process. Additionally, the CHIP will allow the Collaborative to *choose effective policies and programs* in terms of health priorities and *act on what's important* by implementing programs that address the DoN health priorities and the Executive Office of Health and Human Services ("EOHHS") focus areas.

North Suffolk Public Health Collaborative

North Suffolk is developing a CHNA and CHIP for the cities of Revere, Chelsea and Winthrop by bring together chief executives, municipal leaders, community-based organizations, community coalitions, residents, and health care providers to review the needs of the communities. Through this CHNA and CHIP process, the partners will gather primary and secondary data with a focus on the social determinants of health to describe regional and community needs and themes. North Suffolk is focused on what policies, systems and environmental changes may be implemented or scaled to address community needs.

To coordinate the CHNA/CHIP processes, North Suffolk has developed an administrative infrastructure with a Steering Committee and Sub-Committees. The Sub-Committees, include:

- Instrument Review Sub-Committee: Tasked with reviewing survey and focus group/interview instruments from the Boston CHNA-CHIP Collaborative processes. Additionally, the group will make suggestions on how to change the instruments to make them specific to North Suffolk communities.
- Community Outreach Sub-Committee: Charged with survey distribution and focus group coordination, arranging community forums and supporting communication efforts.
- Data Analysis Sub-Committee: Tasked with collating collate all collected data and highlighting common data trends.
- Report Writing Sub-Committee: Tasked with guiding the report writing, including what should be highlighted.

- Implementation Plan and Measures of Success Sub-Committee: Assists in guiding the CHIP. Additionally, helps identify measures of success over the next three years.

Danelle Marable from CCHI is helping to lead the North Suffolk CHNA and CHIP processes and Leslie Aldrich serves as a member of the Steering Committee for North Suffolk.

Similar to the Boston CHNA-CHIP Collaborative's processes, the North Suffolk CHNA will access the needs and resources of its target communities, focus on what's important through a prioritization process. Additionally, the CHIP will allow North Suffolk to choose effective policies and programs in terms of health priorities and act on what's important by implementing programs that address the DoN health priorities and the Executive Office of Health and Human Services ("EOHHS") focus areas. Accordingly, this Community Engagement Plan focuses on each of the aforementioned stages of the CHNA-CHIP processes.

North Suffolk with implement the following community engagement efforts:

- Leadership and Resident Meetings: These meetings will be used to gather qualitative and quantitative data.

- Quality of Life Survey – A community survey to gather resident experiences. This Survey will be broadly distributed to garner a convenience sample. The Survey will be translated into Spanish, Portuguese, and Arabic (the most common languages spoken within the target communities. The Survey will be available in hardcopy and online. The Survey will be two pages with the opportunity to answer additional questions if the respondent chooses to answer additional questions.

- Focus Groups and Interviews – these meetings will be used to gather additional qualitative and quantitative data.

Section 11: Engaging the Community at Large. Which of the stages of a CHNA/CHIP process will the MGH 2019 CHI focus on? Please describe specific activities within each stage and what level the community will be engaged during the MGH 2019 CHI. While the step(s) you focus on are dependent upon your specific community engagement needs as a result of your previous CHNA/CHIP work, for tier 3 applicants the CHI community engagement process must at a minimum include the "Focus on What's Important," "Choose Effective Policies and Programs" and "Act on What's Important" stages.

Described below are the methods that MGH will employ to meet each of the stages of the CHNA/CHIP processes, as well as the associated level of engagement for each stage.

A. Assess Needs and Resources

First, to assess the needs and resources of Boston's various populations, the Boston CHNA-CHIP Collaborative and North Suffolk will conduct primary data collection, including:

- Community surveys: Through this data collection activity large groups of residents from various neighborhoods in Boston will be surveyed on their experiences and perceptions on key topics, as well as residents from Chelsea, Revere and Winthrop. A specific focus will be placed on surveying populations that are not typically represented in surveillance systems. To ensure a wide response to the community survey, the Boston CHNA-CHIP Collaborative will:
    - Translate the survey into multiple languages; and

- Obtain a convenience sample by conducting online and in-person surveys, as well as disseminating the survey via social media.

- Boston CHNA-CHIP Collaborative – Focus groups: The members of the Community Engagement Work Group were surveyed to determine which groups should be included in the focus groups. Based on feedback provided by members during the survey process, the Community Engagement Work Group determined that twelve focus groups representing diverse population segments would be appropriate. Consequently, the following focus groups will be carried out (please note, further neighborhood specificity will be solidified once the Community Engagement Work Group engages with organizations who can recruit for these meetings):
  - Female low-wage workers (e.g. housekeepers, child care workers, hotel service workers, etc.);
  - Male low-wage workers (e.g. janitorial staff, construction, etc.);
  - Seniors (ages 60-75) with complex, challenging issues (e.g. homebound, medical complications);
  - Residents who are housing insecure (no permanent address or close to eviction) in Dorchester, Mattapan, or Roxbury;
  - Latino residents in East Boston;
  - LGBTQ youth (ages 14-18 years), homeless or at risk of being homeless;
  - Immigrant parents of school age children (5-18 years) (especially parents who have newly arrived/in past few years);
  - Survivors of violence; family members who have been impacted by violence;
  - Parents who live in public housing in Dorchester or Hyde Park;
  - Chinese residents living in Chinatown;
  - Middle income residents/households who are right above eligibility, so they do not qualify for services geared towards low income residents; and
  - Haitian residents living in Mattapan.

If these aforementioned focus groups do not materialize for some of the noted populations, then the following groups will be pursued as alternatives:

- Residents in recovery, actively in substance use recovery services;
- Parents of school age children (5-18 years) with special needs; and
- Residents of color with a physical disability.

- Key Informant interviews: HRiA will carry out forty key informant interviews with individuals that represent a cross-section of roles and positions – from grassroots staff to community leaders and executives. Based on feedback from the Community Engagement Work Group, the following individuals were selected for interviews:

Organization	Name	Title or Role	Sector/ Area of Focus
Action for Boston Community Development (ABCD)	Yvonne Jones	Board Chair, representing Dorchester and community leader	Community development; early childhood
Boston Chinatown Neighborhood Center	Yoyo Yau	Director of Family & Community Engagement Programs	Neighborhood focus
Boston Public Schools	Marilyn Morrisse	Nurse at Young Achievers Science and Mathematics School (K-8th school)	Youth; educational system
Black Ministerial Alliance	Sharyn Halliday	Teen Cafe Coordinator & Interim Director of Education, Victory	Faith community; youth

Organization	Name	Title or Role	Sector/ Area of Focus
		Generation Out-of-School Time Program	
Boston Area Rape Crisis Center	Patrick Donovan	Interim Director of Community Awareness and Prevention Services	Violence/trauma
Boston Center for Independent Living	Bill Henning	Executive Director	Disability community
Boston City Council	Andrea Campbell	President of Boston City Council	Government
Boston Healthcare for the Homeless	Georgia Thomas-Dias,	Director, Family Team	Housing/homelessness; healthcare
Boston Medical Center	Dr. Megan Sandel	MD, Associate Director of GROW clinic at BMC	Housing/homelessness; healthcare
Boston Police Department	Superintendent Nora Baston	Bureau Chief, Bureau of Community Engagement	Public safety
Boston Private Industry Council	Alysia Ordway	Employment Engagement Director	Business/workforce development
Boston Public Health Commission	Monica Valdes Lupi	Executive Director	Government; public Health
Boston Public Schools Homeless Coordinator	Mary William	District Liaison, Homeless Education Resource Network (HERN)	Youth; educational system; housing/homelessness
Boston Re-entry Initiative	Jen Maconochie	Director, Strategic Initiatives & Policies, Office of the Police Commissioner	Public safety; social service; workforce development
Bowdoin Street Health Center	Dr. Juan Alves	Physician (works a lot with Cape Verdean community)	Healthcare; specific populations
Casa Myrna	Joanna Garcia	Bilingual Counselor	Violence/trauma
Climate Ready Boston	Bud Ris	Senior Advisor on Climate, Barr Foundation	Environment
Community Servings	Jean Terranova	Director of Food and Health Policy	Food insecurity
Department of Children and Family Services	Amanda Harmon	Social Worker	Youth; social services
Dimock Health Center	Myechia Minter-Jordan	President and CEO	Healthcare; neighborhood focus
Economic Mobility Pathways (EMPath)	Ashley Winning, ScD	Vice President of Research & Evaluation	Workforce development
Ethos	Dale Mitchel	CEO	Senior population; expert in LGBTQ seniors
Fenway Health	David Todisco	Acting Director of Behavioral Health	Healthcare, neighborhood focus; LGTBQ community
Grayken Center for Addiction at BMC	Michael Botticelli	Executive Director, Grayken Center for Addiction at BMC	Substance use
Greater Boston Food Pantry	Rachel Zach	Epidemiologist	Food insecurity; social services
Green Justice Coalition	Rev. Mariama White-Hammond,	Minister for Ecological Justice at Bethel AME Church in Boston and a fellow with the Green Justice Coalition	Environment; faith community

Organization	Name	Title or Role	Sector/ Area of Focus
Horizons for Homeless Children	Sheila O'Neil	Executive Director, Community Children's Centers & Family Partnerships	Housing/homelessness; youth
Islamic Society of Boston Cultural Center	Yusufi Vali	Director of Strategic Relations & Public Affairs and Interim Director of Operations	Faith community
Massachusetts Department of Public Health	Monica Bharel	Commissioner	Government; public health
Metropolitan Area Planning Council (MAPC)	Eric Bourassa	Transportation Director	Transportation
Mother's for Justice and Equality	Monalisa Smith	President	Violence/trauma
Osrisis Institute	Larry Higginbottom	CEO/ Founder of the Osiris Institute	Mental health
Pine Street Inn	Lyndia Downie	President	Housing/homelessness
Project Bread	Miriam Avila	Community Relation Coordinator, Child Nutrition Outreach Program	Food insecurity
Prostate Health Education Network (PHEN)	Tom Farrington	President and Founder of Prostate Health Education Network (PHEN)	Chronic disease; cancer
Rosie's Place	Sandy Mariano	VP of Internal Programs	Housing/homelessness
SEIU	Peter Mackinnon	President	Labor/workforce development
South Cove Community Health Center	Eugene Welch	Executive Director	Healthcare; neighborhood focus
The Boston Foundation	Paul Grogan	President and CEO	Philanthropy
VIET-AID	Lisette Le	Executive Director	Community development; neighborhood focus; specific populations

If interviews do not materialize for some of the individuals outlined in the aforementioned list, then the following organizations will be pursued as alternatives:

- Alternatives for Community and Environment in Roxbury;
- Baraka Community Wellness;
- Boston Public Schools Parent Site Council;
- Community Relations Departments within local universities/colleges (e.g. Boston University, Northeastern University, etc.);
- Federal Reserve - community engagement section;
- Mayor's Office of New Bostonians;
- Mel King Institute of Community Building;
- Nurtury Boston;
- Teen Empowerment Boston; and/or
- YMCA of Greater Boston.

The Boston CHNA-CHIP Collaborative also will utilize secondary data to complete the CHNA and assess needs and resources. To develop a list of potential data indicators, members of the

Secondary Data Work Group provided suggestions of indicators and data sources on the established priorities. Based on this feedback, an identified list of secondary indicators was amalgamated. The following criteria guided these conversations:

- Falls within the topics identified as primary/already priority topics;
- Valid, reliable, or standard indicator for the topic;
- There is a known data source or a starting point for looking for data;
- Relatively current data available;
- Delves deeper or builds off of previous Health of Boston report (not just replication);
- Data source is methodologically strong or provides very unique perspective;
- Feasible to acquire within current resources for project; and
- Is not too duplicative of other data being acquired.

Please note: Indicators did not need to meet a specific number of criteria. Instead, these criteria provided a framework for discussion on the various indicators.

Accordingly, MGH will meet the "Consult" level of engagement for the *Assess Needs and Resources* component of engagement by conducting community meetings, focus groups, key informant interviews and providing community surveys.

B. Focus on What's Important

The Boston CHNA-CHIP Collaborative will ensure that Collaborative members are focused on the most important health needs of Boston's diverse populations by having members of the Steering Committee participate in a prioritization meeting where they rank health priorities based on specific criteria, including the priority's relevance, appropriateness, impact and feasibility. A similar process will occur with the North Suffolk CHNA.

Accordingly, for this phase, MGH will reach the "Collaborate" level of engagement.

C. Choose Effective Policies and Procedures

Based on the selected health priorities, both Collaboratives will develop their CHIPs. The CHIPs will include two to four priority areas for action with aspirational goals, measurable objectives, strategies to address the goals, and metrics to define success. The CHIPs aim to identify opportunities for partnership, new ideas, and leveraging existing efforts to enhance collective impact. Priority areas will be based on consensus building and participatory decision making. Feedback also will be sought from MGH's Trustee Committee, CAB members, faculty members and other staff in regard to the health priorities and focus areas.

For this phase, MGH will reach the "Collaborate" level of engagement.

D. Act on What's Important

To ensure the MGH is acting on appropriate health priorities and carrying out the CHI process, the hospital will take the following steps:

- Hold regular meetings of the CAB: This Committee is tasked with providing input on the CHNA/CHIP processes. Additionally, the CAB will determine innovative strategies beyond a request for proposal ("RFP") process to disburse funds.

- Develop an Allocation Committee: This Committee is charged with facilitating a transparent RFP process and disbursing funds to selected organizations.
    - This Committee is tasked with developing a sound solicitation process including a Bidders Conferences that allows MGH to provide potential applicants with information on the RFP. Additionally, the Allocation Committee will ensure that technical assistance resources are available during the RFP process. The Allocation Committee also will ensure there are no conflicts of interest with the distribution of funds.
    - This Committee will review innovative strategies, other than a solicitation process, and determine how these strategies may be implemented.

For this phase, MGH will also work with local leaders to be part of the process to build public will and mobilize community groups around monies for specific priorities/strategies.

For the procurement aspect of this phase, MGH will reach the "Involve" level of engagement. Additionally, for the CHI implementation aspect of this phase, where CHI funds are distributed to organizations and CHI projects are implemented, MGH will again reach the "Collaborate" level of engagement. Finally, in regard to the disclosure process by CAB members to disclose conflicts of interest, MGH will reach the "Involve" level of engagement.

E. Evaluate Actions

MGH will work with an internal or external evaluator to collaborate with the Hospital on the CHI process. The evaluation team will be tasked with monitoring and evaluating the community partners on an ongoing basis and reporting progress to MGH on CHI activities on an annual basis. Post-review, these reports will be submitted to the Department of Public Health.

For this phase, MGH will reach the "Collaborate" level of engagement.

Attachment/Exhibit

E

The Massachusetts General Hospital Main Campus Determination of Need
Community Health Initiative Narrative

I. Community Health Initiative Monies

The breakdown of Community Health Initiative ("CHI") monies for the Proposed Project at the Massachusetts General Hospital ("MGH") is as follows:

- Maximum Capital Expenditure: $102,204,696.00
- Community Health Initiative: $ $5,110,234.80 (5% of Maximum Capital Expenditure)
- CHI Administrative Fee to be retained by MGH: $102,204.70 (2% of the CHI monies)
- Overall CHI Money – less the Administrative Fee: $5,008,030.10

- CHI Funding for Statewide Initiative: $1,252,007.52 (25% of CHI monies – less the administrative fee)
- CHI Local Funding: $3,756,022.58 (75% of CHI monies – less the Administrative Fee and the Evaluation Monies)
- Evaluation Monies to be retained by MGH: $375,602.26 (10% of the CHI Local Funding).

II. Background Information

The Community Health Initiative ("CHI") processes and community engagement for the proposed Determination of Need ("DoN") Project[1] will be conducted by staff at the Massachusetts General Hospital – Center for Community Health Improvement ("CCHI"). CCHI brings together people and resources to address challenging health problems and foster sustainable improvement. Focusing on the social determinants of health, CCHI seeks to eliminate health inequities based on socioeconomic status, race and ethnicity. Staff leverage prevention, early intervention and treatment approaches that are measurable and have proven impact.

Collaborating with Communities to Create Positive Impact: CCHI builds relationships and works with community partners to make measurable, sustainable improvement on some of the areas' toughest health problems. Good health begins with healthy communities that have access to healthy foods, safe places for children to play and positive activities for teens. Communities must also have access to a health care system with programs to prevent, screen for and treat conditions such as asthma, obesity, cancer, domestic violence and substance use. Achieving these ends takes a collaborative approach. Consequently, CCHI works with multiple partners to bring prevention efforts and programming to the communities that its serves.

CCHI's Communities and Populations: CCHI carries out its work in Chelsea, Revere and Charlestown, where MGH has maintained health care centers for more than forty years. CCHI programs also work with Boston youth and special populations, such as the homeless,

[1] The DoN application requests approval for the following: (1) renovation and expansion of the electrophysiology lab; (2) renovation and expansion of the emergency department; (3) renovation and expansion of the endoscopy service; (4) acquisition of a PET/MR unit for part-time PET/MR clinical use and part-time MRI-only use; and (5) other renovation and conservation projects to maintain and improve existing services and facilities (collectively, the "Proposed Project").

immigrants and refugees to improve their health status. Since 1995, CCHI has partnered with the communities that it serves to assess needs and to create programs that:

- Reduce and prevent substance use disorders;
- Intervene in the cycle of violence;
- Tackle the obesity epidemic by increasing access to healthy food and physical activity
- Increase access to care for vulnerable populations, such as immigrants and refugees, seniors and homeless people;
- Prevent cancer through early detection and screening; and
- Generate interest in science and health careers among youth

Community Health Needs Assessment Process: To ensure that MGH's outreach activities and programs are meeting the health needs of the community, staff from CCHI are currently participating in two robust community health needs assessment ("CHNA") processes, including the Boston CHNA-CHIP Collaborative and the North Suffolk Public Health Collaborative CHNA/CHIP processes.

The Boston CHNA-CHIP Collaborative is an exciting new initiative being carried out by a number of stakeholders, including community-based organizations, health centers, hospitals and the Boston Public Health Commission. This group was formed to undertake the first city-wide CHNA and Community Health Improvement Plan ("CHIP") for the City of Boston. This innovative Collaborative aims to achieve the benefits of broad partnership around a Boston-based CHNA and CHIP, including deeper engagement of key community and organizational stakeholders; enhanced alignment of defined priorities and strategies; maximal allocation of resources; coordination of implementation strategies for collective impact and a healthier Boston. This CHNA is set to be complete during the Summer of 2019 with a CHIP finalized by early Fall 2019.

The North Suffolk Public Health Collaborative also is in the midst of developing an integrated 2019 CHNA for the cities of Chelsea, Revere and Winthrop. These CHNA and CHIP processes bring together municipal leaders, community coalitions, residents, and healthcare providers to gather data and resources to assess the social determinant of health and health care needs of each city. This CHNA and CHIP are following a similar timeline to the Boston CHNA-CHIP Collaborative's processes, with a finalized CHNA by the end of the Summer and a finalized CHIP by Fall 2019.

- <u>Boston CHNA-CHIP Collaborative – CHNA Methodology:</u>

  The Collaborative's CHNA process is based on the Association for Community Health Improvement's Community Health Assessment Toolkit. Consequently, the stages of this CHNA, include: (1) Reflect and strategize on previous assessments; (2) Identify and engage stakeholders through a clear engagement plan; (3) Define the community by developing geographic boundaries and identifying populations to participate in the processes; (4) Collect and analyze data – applying quantitative and qualitative research principles to the processes; (5) Prioritize community health issues through clearly identified criteria; (6) Document and communicate results of the assessment to the community; (7) Plan implementation strategies by engaging in strategic partnerships with internal and external partners; (8) Implement strategies through an implementation committee and (9) Evaluate progress to determine the impact of interventions.

- North Suffolk Public Health Collaborative – CHNA Methodology:

  The North Suffolk Public Health Collaborative is guided by the Mobilizing for Action through Planning and Partnerships ("MAPP") process for its CHNA. MAPP is a community-driven strategic planning process for improving community health. Facilitated by public health leaders, this framework helps communities apply strategic thinking to prioritize public health issues and identify resources to address them. MAPP is not an agency-focused assessment process; rather, it is an interactive process that can improve the efficiency, effectiveness, and ultimately the performance of local public health systems.[2]

III. Oversight of CHI Processes

To ensure accountability and appropriate implementation, CCHI staff will work with the following groups:

- **Community Advisory Board ("CAB"):** The CAB was established to provide oversight and advise on the Attorney General and DoN community engagement processes, priorities and CHIP initiatives. MGH's CAB is comprised of nineteen members from Boston, Charlestown, East Boston, Chelsea and Revere that meet the required constituencies designated by the Department of Public Health for a DoN – CHI. These individuals work with Joan Quinlan, MPA, Vice President for Community Health at MGH and Leslie Aldrich, Executive Director of CCHI at MGH. Ms. Quinlan and Ms. Aldrich report to the MGH Trustee Committee on the progress of the CAB with Determination of Need ("DoN") – Community Health Initiatives ("CHIs"). Additionally, Ms. Quinlan and Ms. Aldrich keep CAB members apprised of the processes being undertaken by the Boston CHNA-CHIP Collaborative and the North Suffolk Public Health Collaborative. In the coming years, CCHI staff expect to increase the size of this CAB to twenty-five individuals, including participation by individuals in additional sectors within the community, including safe place, faith-based organizations, small business, etc. This expanded CAB will ensure even more robust efforts to engage and work with community groups and coalitions.

  In general, the CAB is tasked with reviewing the DoN sub-regulatory guidelines, outlining roles and responsibilities for the group, and reviewing past CHNAs and CHIPs to determine health priorities for the DoN – CHI. For the DoN – CHI, the CAB will be responsible for selecting the health priorities and strategies for the Hospital. Post-selection of health priorities and strategies, CAB members will participate in a conflict of interest process, with those individuals without conflicts participating in an Allocation Committee to disburse CHI funding.

- **MGH Trustee Committee on Community Health ("MGH Trustee Committee"):** CCHI is governed by a Committee of the MGH Board of Trustees. This Committee advises the Hospital and CCHI leadership on focal points for community health. This MGH Trustee Committee is tasked with: (1) Reviewing and approving the CHNA processes and their results; (2) Advising on strategies and programming; (3) Serving as ambassadors of the Hospital's community health agenda within MGH, as well as local communities; and (4)

[2] https://www.naccho.org/programs/public-health-infrastructure/performance-improvement/community-health-assessment/mapp

Where appropriate, assisting with the identification and cultivation of funding opportunities.

- **Executive Committee on Community Health:** In addition to the MGH Trustee Committee, MGH also has an Executive Committee on Community Health ("ECOCH") to promote community health improvement and ensure health equity. ECOCH leverages the four components of MGH mission's: patient care, teaching, research and community health to address community health improvement. ECOCH is comprised of twenty-six hospital leaders and is chaired by Katrina Armstrong, MD, physician-in-chief of MGH's Department of Medicine. The Committee's priorities are guided by the findings of the triennial CHNA and the community health strategic plan. To improve health across populations as well as race equity, ECOCH has a focus on social and economic determinants of health, access to care for low-income patients and collaborating with MGH's Diversity and Inclusion Committee around issues of race and racism.

- **Community Engagement through Community Coalitions:** Within the communities of Charlestown, East Boston, Revere & Chelsea, CCHI serves as the backbone to four multi-sector coalitions using a collective impact framework. Hospital staff work in the noted communities and convene local stakeholders, as well as community residents in assessing the health needs of the communities and developing programmatic solutions. In these instances, CCHI acts as a community convener and facilitator, implementing best practices, providing evaluation support, and accessing a range of resources in the community to ensure accurate processes.

IV. Community Advisory Board Duties

The CAB is tasked with the following responsibilities:

- Ensuring appropriate engagement with residents from targeted communities and community partners around the CHI.
- Determining the Health Priorities and Strategies for CHI funding based upon the needs identified in the Boston CHNA and CHIP and the North Suffolk Public Health CHNA and CHIP. The CAB will ensure that all Health Priorities and Strategies are aligned with the Department of Public Health's Health Priorities and the Executive Office of Health and Human Services' Focus Areas.
- Selecting Health Priorities and Strategies.
- Providing oversight to an evaluator that is selected to carry out the evaluation of CHI-funded projects.
- Completing and submitting the Health Priorities and Strategies Selection Form for approval by the Department of Public Health.
- Conducting a conflict of interest disclosure process to determine which members also will comprise the Allocation Committee (a Conflict of Interest Form will be developed).
- Reporting to the Department of Public Health on the DoN – CHI.

V. Allocation Committee Duties

The Allocation Committee will be comprised of CAB members who do not have a conflict of interest, as well as experts in the noted fields who choose to participate in the process. The scope of work that the Allocation Committee will carry out includes:

- Carrying out formal solicitation processes (targeted and untargeted) for the disbursement of CHI funds for the noted Health Priorities and Strategies. This process will include the development of a request for proposal ("RFP") and Bidders Conference (complete with technical assistance resources).
- Development of creative, transparent strategies for disbursing DoN CHI monies.
- Engaging technical assistance resources that can support and assist applicants with their responses to the RFP.
- Disbursement of CHI funding.
- Review and analyze grantee reports on the impact of CHI funding.

VI. Timeline for CHI Activities

Upon a Notice of Determination of Need being issued by the Public Health Council, the External DoN Advisory Committee will commence meeting and begin the CHI Process. The timeline for CHI activities is as follows:

- One to two month post-approval: The CAB will begin selection of the Health Priorities and Strategies for CHI funding.
- Three to fourth months post-approval: The CAB selects Health Strategies for noted Health Priorities and submits the Health Priorities and Strategies Selection Form to the Department of Public Health for review and approval.
- Four to five months post-approval: The CAB conducts a conflict of interest disclosure process to determine which members of the Committee will move on to the Allocation Committee.
- Five to six months post-approval: The CAB is developing the RFP process and determining how this process will work in tandem with CCHI's ongoing community health activities and engagement.
- Seven to eight months post-approval: The RFP for funding is released.
- Eight to nine months post-approval: Bidders conferences are held on the RFP.
- Eleven months post-approval: Responses are due for the RFP.
- Twelve to Fourteen months post-approval: Funding decisions are made, and the disbursement of funds begins.
- Seventeen to Eighteen months post-approval: The evaluator will begin evaluation work on the CHI funded initiatives.

The aforementioned process is longer than the process outlined in the DoN Guidelines for Tier 3 projects. However, given previous experience with similar RFP processes, CCHI staff feel strongly that it will take seven to eight months to develop a RFP process that is transparent, fair and appropriate and that providing three to four months for applicants to respond to the RFP is critical to obtaining thoughtful, well-written and technically accurate RFP responses.

VII. Request for Additional Years of Funding

MGH is seeking additional time to carry out the disbursement of funds for the CHI. Based on previous initiatives conducted by CCHI, the Hospital is seeking to provide potential multi-year

grants with CHI funding that leads to sustainable programs in the target communities. To achieve sustainable programming, MGH is seeking to disburse CHI monies over a three to five-year period to ensure the greatest impact for the largest number of individuals, as well as continued sustainability of specific projects that need additional support.

VIII. Evaluation Overview

MGH is seeking to use up to 10% of all CHI funding ($375,602.26) for evaluation. These monies will allow MGH to engage a third-party evaluator or use internal resources to carry out evaluation of the planning process, as well as assess the overall impact of CHI funding. Through this evaluation, MGH is seeking to learn from each of its grantees and develop a forum for sharing best practices and understanding the feasibility of replicating interventions. The evaluation team will develop annual reports for review by the CAB and post-review, submission to the Department of Public Health.

IX. Justification for Administrative Monies

Applicants submitting a Tier 3 CHI are eligible to obtain 2% of the CHI amount for administrative costs. Consequently, MGH is requesting 2% of the CHI funding ($102,204.70) for administrative expenses to carry out the CHI work. First, administrative monies will be used to offset the development of a robust solicitation process. These monies will pay for internal resources and/or external assistance in developing the RFP, technical assistance resources that will be available to organizations that are submitting grant applications, and publication fees associated with advertising the solicitation process in local papers, as well as other operational costs, such as supplies.

Attachment/Exhibit

6

Public Announcement Concerning a Proposed Health Care Project

Partners HealthCare System, Inc. ("Applicant") located at 800 Boylston Street, Suite 1150, Boston, MA 02199 intends to file a Notice of Determination of Need ("Application") with the Massachusetts Department of Public Health for a substantial capital expenditure and acquisition of new technology by The General Hospital Corporation d/b/a Massachusetts General Hospital ("MGH") located at 55 Fruit Street, Boston, MA 02114. The Application requests approval for the following: (1) renovation and expansion of the electrophysiology lab; (2) renovation and expansion of the emergency department; (3) renovation and expansion of the endoscopy service; (4) acquisition of a PET/MR unit for part-time PET/MR clinical use and part-time MRI-only use; and (5) other renovation and conservation projects to maintain and improve existing services and facilities (collectively, the "Proposed Project"). The total value of the Proposed Project based on the maximum capital expenditure is $102,204,696. The Applicant does not anticipate any price or service impacts on the Applicant's existing Patient Panel as a result of the Proposed Project. Any ten Taxpayers of Massachusetts may register in connection with the intended Application by no later than May 9, 2019 or 30 days from the Filing Date, whichever is later, by contacting the Department of Public Health, Determination of Need Program, 250 Washington Street, 6th Floor, Boston, MA 02108.

Mar 26

PUBLIC HEARING NOTICE
321 CMR 3.02(2)

In accordance with the Massachusetts General Laws, Chapter 131, Sections 5 and 63, and Chapter 30A, Section 2, NOTICE is hereby given of a public hearing to be held on Thursday, April 18, 2019, at 11:00 a.m., at the Division of Fisheries and Wildlife's Field Headquarters, Richard Cronin Building, 1 Rabbit Hill Road, off North Drive, Westborough, Massachusetts, to establish rules and regulations relative to the 2019-2020 migratory game bird seasons. Due to federal requirements for reporting the state's migratory game bird season selections, the Board will vote on the proposed regulations at the close of the hearing, and there will be no written comment period following the public hearing.
Mark S. Tisa, Director

Mar 26

Public Announcement

Concerning a Proposed Health Care Project

Partners HealthCare System, Inc. ("Applicant") located at 800 Boylston Street, Suite 1150, Boston, MA 02199 intends to file a Notice of Determination of Need ("Application") with the Massachusetts Department of Public Health for a substantial capital expenditure and acquisition of new technology by The General Hospital Corporation d/b/a Massachusetts General Hospital ("MGH") located at 55 Fruit Street, Boston, MA 02114. The Application requests approval for the following: (1) renovation and expansion of the electrophysiology lab; (2) renovation and expansion of the emergency department; (3) renovation and expansion of the endoscopy service; (4) acquisition of a PET/MR unit for part-time PET/MR clinical use and part-time MRI-only use; and (5) other renovation and conservation projects to maintain and improve existing services and facilities (collectively, the "Proposed Project"). The total value of the Proposed Project based on the maximum capital expenditure is $102,204,696. The Applicant does not anticipate any price or service impacts on the Applicant's existing Patient Panel as a result of the Proposed Project. Any ten Taxpayers of Massachusetts may register in connection with the intended Application by no later than May 9, 2019 or 30 days from the Filing Date, whichever is later, by contacting the Department of Public Health, Determination of Need Program, 250 Washington Street, 6th Floor, Boston, MA 02108.

Attachment/Exhibit

7

Partners HealthCare System, Inc.

Analysis of the Reasonableness of Assumptions Used For and Feasibility of Projected Financials of Partners HealthCare System, Inc. For the Years Ending September 30, 2019 Through September 30, 2023

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BERNARD L. DONOHUE, III, CPA

One Pleasure Island Road
Suite 2B
Wakefield, MA 01880

(781) 569-0070
Fax (781) 569-0460

April 3, 2019

Mr. Brian Huggins
Partners HealthCare Systems, Inc.
399 Revolution Drive STE 645
Somerville, MA 02145

RE: Analysis of the Reasonableness of Assumptions and Projections Used to Support the Financial Feasibility and Sustainability of the Proposed Capital Projects at Massachusetts General Hospital

Dear Mr. Huggins:

I have performed an analysis of the financial projections prepared by Partners HealthCare System, Inc. ("Partners") detailing the projected operations of Partners including the projected operations of the capital projects listed below at Massachusetts General Hospital ("MGH") . This report details my analysis and findings with regards to the reasonableness of assumptions used in the preparation and feasibility of the projected financial information of Partners as prepared by the management of Partners ("Management"). This report is to be included by Partners in its Determination of Need ("DoN") Application – Factor 4(a) and should not be distributed or relied upon for any other purpose.

I. EXECUTIVE SUMMARY

The scope of my analysis was limited to the five year consolidated financial projections (the "Projections") prepared by Partners as well as the actual operating results for Partners for the fiscal year ended in 2018 ("Base Budget"), and the supporting documentation in order to render an opinion as to the reasonableness of assumptions used in the preparation and feasibility of the Projections with regards to the impact of the following capital projects at MGH:

- Electrophysiology Lab Replacement Project
- PET/MR Project of the Department of Radiology
- MGH Emergency Department Expansion and Renovation Project
- Division of Gastroenterology, Endoscopy Unit Procedural Space Renovation Project
- Other Renovation Projects

The impact of the proposed capital projects as listed above at MGH, which are the subject of this DoN application, represent a relatively insignificant component of the projected operating results and financial position of Partners. As such, I determined that the Projections are not likely to result in a scenario where there are insufficient funds available for capital and ongoing operating costs necessary to support the

ongoing operations of Partners. Therefore, it is my opinion that the Projections are financially feasible for Partners as detailed below.

II. RELEVANT BACKGROUND INFORMATION

Refer to Factor 1 of the application for description of proposed capital projects at MGH and the rationale for the expenditures.

III. SCOPE OF REPORT

The scope of this report is limited to an analysis of the Projections, Base Budget and the supporting documentation in order to render an opinion as to the reasonableness of assumptions used in the preparation and feasibility of the Projections with regards to the impact of certain capital projects involving and ancillary to the projects as listed above at MGH. My analysis of the Projections and conclusions contained within this report are based upon my detailed review of all relevant information (see Section IV which references the sources of information). I have gained an understanding of Partners and the capital projects at MGH through my review of the information provided as well as a review of Partners website, annual reports, and the DoN application.

Reasonableness is defined within the context of this report as supportable and proper, given the underlying information. Feasibility is defined as based on the assumptions used, the plan is not likely to result in insufficient "funds available for capital and ongoing operating costs necessary to support the proposed project without negative impacts or consequences to [Partners] existing patient panel" (per Determination of Need, Factor 4(a)).

This report is based upon historical and prospective financial information provided to me by Management. If I had audited the underlying data, matters may have come to my attention that would have resulted in my using amounts that differ from those provided. Accordingly, I do not express an opinion or any other assurances on the underlying data presented or relied upon in this report. I do not provide assurance on the achievability of the results forecasted by Partners because events and circumstances frequently do not occur as expected, and the achievement of the forecasted results are dependent on the actions, plans, and assumptions of management. I reserve the right to update my analysis in the event that I am provided with additional information.

IV. PRIMARY SOURCES OF INFORMATION UTILIZED

In formulating my opinions and conclusions contained in this report, I reviewed documents produced by Management. The documents and information upon which I relied are identified below or are otherwise referenced in this report:

1. Five-Year Pro-Forma Statements for the fiscal years ending 2019 through 2023, initially provided on May 9, 2018 for the Electrophysiology Lab Replacement Project; updated on January 19, 2019 to include the PET/MR Project; further updated on March 13, 2019 to include the MGH Emergency Department Expansion and Renovation Project and the Division of Gastroenterology, Endoscopy Unit Procedural Space Renovation Project and a final update on April 1, 2019;

2. Electrophysiology Lab Replacement Project PHS Finance Committee report, provided May 1, 2018 and updated on January 21, 2019;

3. PET/MR Project of the Department of Radiology PHS Finance Committee report, provided January 21, 2019;

4. MGH Emergency Department Expansion and Renovation Project PHS Finance Committee report, provided March 13, 2019;

5. Division of Gastroenterology, Endoscopy Unit Procedural Space Renovation Project PHS Finance Committee report, provided March 13, 2019;

6. Multi-Year Financial Framework of Partners Healthcare System, Inc. for the fiscal years ending 2019 through 2023 prepared as of December 6, 2018;

7. Audited Financial Statements of Partners HealthCare System, Inc. and Affiliates as of and for the year ended September 30, 2018, provided December 14, 2018;

8. Company website – www.partners.org;

9. Various news publications and other public information about the Company;

10. Determination of Need Application Instructions dated March 2017; and

11. Draft Determination of Need Factor 1 for each of the above-named projects, provided March 28, 2019.

V. REVIEW OF THE PROJECTIONS

This section of my report summarizes my review of the reasonableness of the assumptions used and feasibility of the Projections. The Projections are delineated between five categories of revenue and six general categories of operating expenses of Partners as well as other non-operating gains and losses for the Organization. The following table presents the Key Metrics, as defined below, of Partners which compares the results of the Projections for the fiscal years ending 2019 through 2023 to Partners historical results for the fiscal year ended 2018.

	Partners, as reported	Change in Key Metric of pro forma results compared to prior year				
	2018	**2019**	**2020**	**2021**	**2022**	**2023**
EBIDA ($)	1,164,519	20,635	123,967	52,267	44,865	58,896
EBIDA Margin (%)	8.8%	0.0%	0.5%	0.0%	-0.1%	0.0%
Operating Margin (%)	2.3%	-0.2%	0.3%	0.0%	0.0%	0.0%
Total Margin (%)	6.2%	-1.7%	0.5%	0.0%	0.0%	0.0%
Total Assets ($)	18,303,531	780,881	859,205	631,967	912,802	942,589
Total Net Assets ($)	8,972,581	741,321	767,246	791,471	821,336	847,623
Unrestricted Cash Days on Hand (days)	212.2	18.6	20.4	14.1	20.1	20.0
Unrestricted Cash to Debt (%)	132.5%	13.8%	17.0%	21.7%	18.9%	19.0%
Debt Service Coverage (ratio)	6.5	(1.8)	1.3	(2.8)	3.2	0.3
Debt to Capitalization (%)	43.3%	-2.3%	-1.8%	-2.8%	-1.5%	-1.4%

The Key Metrics fall into three primary categories: profitability, liquidity, and solvency. Profitability metrics, such as EBIDA, EBIDA Margin, Operating Margin, Total Margin, and Debt Service Coverage Ratio are used to assist in the evaluation of management performance in how efficiently resources are

utilized. Liquidity metrics, such as Unrestricted Days Cash on Hand, and Unrestricted Cash-to-Debt measure the quality and adequacy of assets to meet current obligations as they come due. Solvency metrics, such as Debt to Capitalization, and Total Net Assets, measure the company's ability to service debt obligations. Additionally, certain metrics can be applicable in multiple categories.

The following table shows how each of the Key Metrics are calculated.

Key Metric	Definition
EBIDA ($)	(Earnings before interest, depreciation and amortization expenses) - Operating gain (loss) + interest expense + depreciation expense + amortization expense
EBIDA Margin (%)	EBIDA expressed as a % of total operating revenue. EBIDA / total operating revenue
Operating Margin (%)	Income (loss) from operations / total operating revenue
Total Margin (%)	Excess (deficit) of revenue over expenses / total operating revenue
Total Assets ($)	Total assets of the organization
Total Net Assets ($)	Total net assets of the organization (includes unrestricted net assets, temporarily restricted net assets and permanently restricted net assets)
Unrestricted Cash Days on Hand (days)	(Cash & cash equivalents + investments + current portion investments limited as to use + investments limited as to use - externally limited funds) / ((Total operating expenses - non recurring charges - depreciation & amortization) / YTD days)
Unrestricted Cash to Debt (%)	Unrestricted Cash-to-Debt (%) - (Cash & cash equivalents + investments + current portion investments limited as to use + investments limited as to use - externally limited funds) / (Current portion of long-term obligations + long-term obligations)
Debt Service Coverage (ratio)	Debt service coverage ratio (ratio) - (Excess (deficit) of revenue over expenses + depreciation expense + amortization expense + interest expense) / (Principal payments + interest expense)
Debt to Capitalization (%)	Debt to Capitalization (%) - (Current portion of long-term obligation + long-term obligations) / (Current portion of long-term obligations + long-term obligations + unrestricted net assets)

In preparing the Key Metrics, Management noted the following:

- Partners has a balloon payment on long-term debt maturing in fiscal year ending 2021 and prepared the Projections to include the balloon payment.

1. Revenues

The only revenue category on which the proposed capital projects as listed above at MGH would have an impact is net patient service revenue. Therefore, I have analyzed net patient service revenue identified by Partners in both their historical and projected financial information. Based upon my analysis of the projected results from Fiscal Year 2019 through Fiscal Year 2023, the proposed capital projects as listed above for MGH would represent approximately 0.021% (about 2 one-hundredths of 1%) of Partners operating revenue beginning in FY 2019 to 0.173% (about 2 tenths of 1%) in FY 2023. The first year in which revenue is present for the Emergency Department Expansion and Renovation Project is FY 2019. The Electrophysiology Lab Replacement Project and the PET/MR Project of the Department of Radiology generate revenue beginning in FY 2020. The first year in which revenue is present for the

proposed Endoscopy Unit Procedural Space Renovation Project at the Department of Gastroenterology capital project is FY 2023.

It is my opinion that the revenue growth projected by Management reflects a reasonable estimation based primarily upon the organization's historical operations.

2. Operating Expenses

I analyzed each of the categorized operating expenses for reasonableness and feasibility as it relates to the projected revenue items. I reviewed the actual operating results for Partners for the fiscal year ended in 2018 in order to determine the impact of the proposed capital projects as listed above at MGH on the consolidated entity and in order to determine the reasonableness of the Projections for the fiscal years 2019 through 2023. Based upon my analysis of the projected results from Fiscal Year 2019 through Fiscal Year 2023, the proposed capital projects would represent approximately 0.027% (about 3 one-hundredths of 1%) of Partners operating expenses beginning in FY 2019 to 0.161% (just under 2 tenths of 1%) in FY 2023.

It is my opinion that the growth in operating expenses projected by Management reflects a reasonable estimation based primarily upon the organization's historical operations.

3. Non-Operating Gains/Expenses and Other Changes in Net Assets

The final categories of Partners Projections are various non-operating gains/expenses and other changes in net assets. The items in these categories relate to investment account activity (realized and unrealized), philanthropic and academic gifts, benefit plan funded status, fair value adjustments and other items. Because many of these items are unpredictable, nonrecurring, or dependent upon market fluctuations, I analyzed the non-operating activity in aggregate. Based upon my analysis, there were no non-operating expenses projected for the proposed capital projects as listed above at MGH. Accordingly, it is my opinion that the pro-forma non-operating gains/expenses and other changes in net assets are reasonable.

4. Capital Expenditures and Cash Flows

I reviewed Partners capital expenditures and cash flows in order to determine whether Partners anticipated reinvesting sufficient funds for technological upgrades and property, plant and equipment and whether the cash flow would be able to support that reinvestment.

Based upon my discussions with Management and my review of the information provided, I considered the current and projected capital projects and loan financing obligations included within the Projections and the impact of those projected expenditures on Partners cash flow. Based upon my analysis, it is my opinion that the pro-forma capital expenditures and resulting impact on Partners cash flows are reasonable.

VI. FEASIBILITY

I analyzed the projected operations for Partners and the changes in Key Metrics prepared by Management as well as the impact of the proposed capital projects as listed above at MGH upon the Projections and Key Metrics. In performing my analysis, I considered multiple sources of information including historical and projected financial information for Partners. It is important to note that the Projections do not account

for any anticipated changes in accounting standards. These standards, which may have a material impact on individual future years, are not anticipated to have a material impact on the aggregate Projections.

Because the impact of the proposed capital projects as listed above at MGH represents a relatively insignificant portion of the operations and financial position of Partners, I determined that the Projections are not likely to result in insufficient funds available for capital and ongoing operating costs necessary to support the proposed projects. Based upon my review of the Projections and relevant supporting documentation, I determined the projects and continued operating surplus are reasonable and based upon feasible financial assumptions. Therefore, the proposed capital projects listed above at MGH are financially feasible and within the financial capability of Partners.

Respectively submitted,

Bernard L Donohue, III, CPA

Bernard L. Donohue, III, CPA

Attachment/Exhibit

8

The Commonwealth of Massachusetts

OFFICE OF THE MASSACHUSETTS SECRETARY OF STATE
MICHAEL J. CONNOLLY, Secretary
ONE ASHBURTON PLACE, BOSTON, MASSACHUSETTS 02108

ARTICLES OF ORGANIZATION

(Under G.L. Ch. 180)

Examiner

Name Approved

ARTICLE I

The name of the corporation is:

MGH/BRIGHAM HEALTH CARE SYSTEM, INC.

ARTICLE II

The purpose of the corporation is to engage in the following activities:

(i) To organize, operate and support a comprehensive health care system, including without limitation hospital and other health care services for all persons, and education and research for the prevention, diagnosis, treatment and cure of all forms of human illness; (ii) to improve the health and welfare of all persons; (iii) to operate for the benefit of and to support The Massachusetts General Hospital, The Brigham Medical Center, Inc., their respective affiliated corporations and such other charitable, scientific or educational organizations which are or are affiliated with teaching hospitals in the Greater Boston Area; and (iv) to carry on any other activity that may lawfully be carried on by a corporation formed under Chapter 180 of the Massachusetts General Laws which is exempt under section 501(c)(3) of the Internal Revenue Code.

93-349060

C ☐
P ☑
M ☐
R.A. ☐

10
P.C.

Note: If the space provided under any article or item on this form is insufficient, additions shall be set forth on separate 8½ x 11 sheets of paper leaving a left hand margin of at least 1 inch. Additions to more than one article may be continued on a single sheet so long as each article requiring each such addition is clearly indicated.

ARTICLE III

If the corporation has one or more classes of members, the designation of such classes, the manner of election or appointment, the duration of membership and the qualification and rights, including voting rights, of the members of each class, may be set forth in the by-laws of the corporation or may be set forth below:

The designation of classes of members, if any, the manner of election or appointment, the term of office, and the qualifications and rights of members are set forth in the by-laws of the Corporation.

ARTICLE IV

* Other lawful provisions, if any, for the conduct and regulation of the business and affairs of the corporation, for its voluntary dissolution, or for limiting, defining, or regulating the powers of the corporation, or of its directors or members, or of any class of members, are as follows:

See Continuation Sheets IV-A through IV-D attached hereto and incorporated herein by reference.

* If there are no provisions, state "None".

Note: The preceding four (4) articles are considered to be permanent and may ONLY be changed by filing appropriate Articles of Amendment.

IV. Other Lawful Provisions for Conduct and Regulation of the Business and Affairs of the Corporation, for its Voluntary Dissolution, and for Limiting, Defining and Regulating the Powers of the Corporation and of its Trustees and Members.

4.1. The corporation shall have in furtherance of its corporate purposes all of the powers specified in Section 6 of Chapter 180 and in Sections 9 and 9A of Chapter 156B of the Massachusetts General Laws (except those provided in paragraph (m) of said Section 9) as now in force or as hereafter amended, and may carry on any operation or activity referred to in Article 2 to the same extent as might an individual, either alone or in a joint venture or other arrangement with others, or through a wholly or partly owned or controlled corporation; provided, however, that no such power shall be exercised in a manner inconsistent with said Chapter 180 or any other chapter of the Massachusetts General Laws or which would deprive it of exemption from federal income tax as an organization described in Section 501(c)(3) of the Internal Revenue Code.

4.2. The by-laws may authorize the trustees to make, amend or repeal the by-laws in whole or in part, except with respect to any provision thereof which by law, the articles of organization or the by-laws requires action by the members.

4.3. Meetings of the members may be held anywhere in the United States.

4.4. No trustee or officer of the corporation shall be personally liable to the corporation or its members for monetary damages for breach of fiduciary duty as such trustee or officer notwithstanding any provision of law imposing such liability, except to the extent that such exemption from liability is not permitted under Chapter 180 of the Massachusetts General Laws.

4.5.(a) The corporation shall, to the extent legally permissible, indemnify each person who serves as one of its members, trustees or officers, or who serves at its request as a member, trustee or officer of another organization or in a capacity with respeot to any employee benefit plan (each such person being called in this Section 4.5 a "Person") against all liabilities and expenses, including amounts paid in satisfaction of judgments, in compromise or as fines and penalties, and

counsel fees, reasonably incurred by such Person in connection with the defense or disposition of any action, suit or other proceeding, whether civil or criminal, in which such Person may be involved or with which such Person may be threatened, while in office or thereafter, by reason of being or having been such a Person, except with respect to any matter as to which such Person shall have been adjudicated in any proceeding not to have acted in good faith in the reasonable belief that his or her action was in the best interests of the corporation or, to the extent that such matter relates to service at the request of the corporation for another organization or an employee benefit plan, in the best interests of such organization or of the participants or beneficiaries of such employee benefit plan. Such best interests shall be deemed to be the best interests of the corporation for the purposes of this Section 4.5.

(b) Notwithstanding the foregoing, as to any matter disposed of by a compromise payment by any Person, pursuant to a consent decree or otherwise, no indemnification either for said payment or for any other expenses shall be provided unless such compromise shall be approved as in the best interests of the corporation, after notice that it involves such indemnification, (a) by a disinterested majority of the trustees then in office; or (b) by a majority of the disinterested trustees then in office, provided that there has been obtained an opinion in writing of independent legal counsel to the effect that such Person appears to have acted in good faith in the reasonable belief that his or her action was in the best interests of the corporation; or (c) by a majority of the disinterested members entitled to vote, voting as a single class.

(c) Expenses, including counsel fees, reasonably incurred by any Person in connection with the defense or disposition of any such action, suit or other proceeding may be paid from time to time by the corporation in advance of the final disposition thereof upon receipt of an undertaking by such Person to repay the amounts so paid if such Person ultimately shall be adjudicated to be not entitled to indemnification under this Section 4.5. Such an undertaking may be accepted without reference to the financial ability of such Person to make repayment.

(d) The right of indemnification hereby provided shall not be exclusive. Nothing contained in this Section shall affect any other rights to indemnification to which any Person or other corporate personnel may be entitled by contract or otherwise under law.

(e) As used in this Section 4.5, the term "Person" includes such Person's respective heirs, executors and administrators, and

a "disinterested" member, trustee or officer is one against whom in such capacity the proceeding in question, or another proceeding on the same or similar grounds, is not then pending.

4.6.(a) No person shall be disqualified from holding any office by reason of any interest. In the absence of fraud, any trustee, officer or member of this corporation, or any concern in which any such trustee, officer or member has any interest, may be a party to, or may be pecuniarily or otherwise interested in, any contract, act or other transaction (collectively called a "transaction") of this corporation, and

(1) such transaction shall not be in any way invalidated or otherwise affected by that fact; and

(2) no such trustee, officer, member or concern shall be liable to account to this corporation for any profit or benefit realized through any such transaction;

provided, however, that such transaction either was fair at the time it was entered into or is authorized or ratified either (i) by a majority of the trustees who are not so interested and to whom the nature of such interest has been disclosed, or (ii) by vote of a majority of each class of members of the corporation entitled to vote for trustees, at any meeting of members the notice of which, or an accompanying statement, summarizes the nature of such transaction and such interest. No interested trustee or member of this corporation may vote or may be counted in determining the existence of a quorum at any meeting at which such transaction shall be authorized, but may participate in discussion thereof.

(b) For purposes of this Section 4.6, the term "interest" shall include personal interest and also interest as a trustee, officer, stockholder, shareholder, director, member or beneficiary of any concern; and the term "concern" shall mean any corporation, association, trust, partnership, firm, person or other entity other than this corporation.

(c) No transaction shall be avoided by reason of any provisions of this paragraph 4.6 which would be valid but for such provisions.

4.7. No part of the assets or net earnings of the corporation shall inure to the benefit of any member, officer or trustee of the corporation or any individual; no substantial part of the activities of the corporation shall be the carrying on of propaganda, or otherwise attempting, to influence legislation except to the extent permitted by Section 501(h) of the Internal Revenue Code; and the corporation shall not participate in, or

intervene in (including the publishing or distributing of statements), any political campaign on behalf of (or in opposition to) any candidate for public office. It is intended that the corporation shall be entitled to exemption from federal income tax as an organization described in Section 501(c)(3) of the Internal Revenue Code and shall not be a private foundation under Section 509(a) of the Internal Revenue Code.

4.8. If and so long as the corporation is a private foundation (as that term is defined in Section 509 of the Internal Revenue Code), then notwithstanding any other provisions of the articles of organization or the by-laws of the corporation, the following provisions shall apply:

A) the income of the corporation for each taxable year shall be distributed at such time and in such manner as not to subject the corporation to the tax on undistributed income imposed by Section 4942 of the Internal Revenue Code, and

B) the corporation shall not engage in any act of self dealing (as defined in Section 4941(d) of the Internal Revenue Code), nor retain any excess business holdings (as defined in Section 4943(c) of the Internal Revenue Code), nor make any investments in such manner as to subject the corporation to tax under Section 4944 of the Internal Revenue Code, nor make any taxable expenditures (as defined in Section 4945(d) of the Internal Revenue Code).

4.9. Upon the liquidation or dissolution of the corporation, after payment of all of the liabilities of the corporation or due provision therefor, all of the assets of the corporation shall be disposed of pursuant to Massachusetts General Laws, Chapter 180, Section 11A, to The Massachusetts General Hospital and The Brigham Medical Center, Inc. if exempt from taxation as organizations described in Section 501(c)(3) of the Internal Revenue Code or, if both are not, to one or more organizations with similar purposes and similar tax exemption.

4.10. All references herein: (i) to the Internal Revenue Code shall be deemed to refer to the Internal Revenue Code of 1986, as now in force or hereafter amended; (ii) to the General Laws of The Commonwealth of Massachusetts, or any chapter thereof, shall be deemed to refer to said General Laws or chapter as now in force or hereafter amended; and (iii) to particular sections of the Internal Revenue Code or said General Laws shall be deemed to refer to similar or successor provisions hereafter adopted.

MGH/BRIGHAM HEALTH CARE SYSTEM, INC.

Continuation Sheet VII(b)

	Name	Residence or Post Office Address
Officers		
Vice-President	J. Robert Buchanan, M.D.	25 Commonwealth Avenue Boston, MA 02116
President	H. Richard Nesson, M.D.	565 Boylston Street Brookline, MA 02146
Treasurer	Richard A. Spindler	210 Schoolmaster Lane Dedham, MA 02026
Clerk	David M. Donaldson	22 Weston Road Lincoln Center, MA 01773
Trustees	W. Gerald Austen, M.D.	163 Wellesley Street Weston, MA 02193
	Eugene Braunwald, M.D.	75 Scotch Pine Road Weston, MA 02193
	J. Robert Buchanan, M.D.	25 Commonealth Avenue Boston, MA 02116
	Francis H. Burr	44 Prince Street Beverly, MA 01915
	Ferdinand Colloredo-Mansfeld	Winthrop Street Hamilton, MA 01982

MGH/BRIGHAM HEALTH CARE SYSTEM, INC.

Continuation Sheet VII(b)

Name	Residence or Post Office Address
John H. McArthur	Fowler 10 Soldiers Field Boston, MA 02134
H. Richard Nesson, M.D.	565 Boylston Street Brookline, MA 02146
Richard A. Spindler	210 Schoolmaster Lane Dedham, MA 02026

ARTICLE V

By-laws of the corporation have been duly adopted and the initial directors, president, treasurer and clerk or other presiding, financial or recording officers, whose names are set out below, have been duly elected.

ARTICLE VI

The effective date of organization of the corporation shall be the date of filing with the Secretary of the Commonwealth or if a later date is desired, specify date, (not more than 30 days after date of filing).

The information contained in ARTICLE VII is NOT a PERMANENT part of the Articles of Organization and may be changed ONLY by filing the appropriate form provided therefor.

ARTICLE VII

a. The post office address of the initial principal office of the corporation IN MASSACHUSETTS is:

c/o Ropes & Gray, One International Place, Boston, MA 02110

b. The name, residence and post office address of each of the initial directors and following officers of the corporation are as follows:

	NAME	RESIDENCE	POST OFFICE ADDRESS
President:	See Continuation Sheet VII(b) attached hereto and incorporated herein by reference.		
Treasurer:			
Clerk:			

Directors: (or officers having the powers of directors).

NAME	RESIDENCE	POST OFFICE ADDRESS
See Continuation Sheet VII(b) attached hereto and incorporated herein by reference.		

c. The fiscal year of the corporation shall end on the last day of the month of: September

d. The name and BUSINESS address of the RESIDENT AGENT of the corporation, if any, is:

I/We the below-signed INCORPORATORS do hereby certify under the pains and penalties of perjury that I/We have not been convicted of any crimes relating to alcohol or gaming within the past ten years. I/We do hereby further certify that to the best of my/our knowledge the above-named principal officers have not been similarly convicted. If so convicted, explain.

IN WITNESS WHEREOF and under the pains and penalties of perjury, I/WE, whose signature(s) appear below as incorporator(s) and whose names and business or residential address(es) ARE CLEARLY TYPED OR PRINTED beneath each signature do hereby associate with the intention of forming this corporation under the provisions of General Laws Chapter 180 and do hereby sign these Articles of Organization as incorporator(s) this 9th day of December, 19 93

David M. Donaldson

David M. Donaldson

Ropes & Gray
One International Place
Boston, MA 02110

NOTE: If an already-existing corporation is acting as incorporator, type in the exact name of the corporation, the state or other jurisdiction where it was incorporated, the name of the person signing on behalf of said corporation and the title he/she holds or other authority by which such action is taken.

SECRETARY OF STATE
RECEIVED
1993 DEC 15 PM 1:39
CORPORATION DIVISION

449104

THE COMMONWEALTH OF MASSACHUSETTS

ARTICLES OF ORGANIZATION

GENERAL LAWS, CHAPTER 180

I hereby certify that, upon an examination of the within-written articles of organization, duly submitted to me, it appears that the provisions of the General Laws relative to the organization of corporations have been complied with, and I hereby approve said articles; and the filing fee in the amount of $35.00 having been paid, said articles are deemed to have been filed with me this 15TH day of December 1993.

Effective date

Michael Joseph Connolly

MICHAEL J. CONNOLLY
Secretary of State

A PHOTOCOPY OF THESE ARTICLES OF ORGANIZATION SHALL BE RETURNED

TO: David M. Donaldson, Esq.
Ropes & Gray
One International Place, Boston, MA 02110

Telephone: (617) 951-7250

FEE: $15.00

The Commonwealth of Massachusetts

MICHAEL J. CONNOLLY
Secretary of State
ONE ASHBURTON PLACE, BOSTON, MASS. 02108

FEDERAL IDENTIFICATION NO. 00044904

ARTICLES OF AMENDMENT

General Laws, Chapter 180, Section 7

811

This certificate must be submitted to the Secretary of the Commonwealth within sixty days after the date of the vote of members or stockholders adopting the amendment. The fee for filing this certificate is $15.00 as prescribed by General Laws, Chapter 180, Section 11C(b). Make check payable to the Commonwealth of Massachusetts.

We. H. Richard Nesson
David M. Donaldson
, President/Vice President, and
, Clerk/Assistant Clerk of

MGH/BRIGHAM HEALTH CARE SYSTEM, INC.
(Name of Corporation)

located at One International Place, Boston, MA 02110

do hereby certify that the following amendment to the articles of organization of the corporation was duly adopted at a meeting held on March 14, 19 94, by vote of all members/~~shareholders, being the holders of its~~

That the Articles of Organization of this corporation be and they hereby are amended to change the name of the corporation to "Partners HealthCare System, Inc."

Note: If the space provided under any article or item on this form is insufficient, additions shall be set forth on separate 8½ x 11 sheets of paper leaving a left hand margin of at least 1 inch for binding. Additions to more than one article may be continued on a single sheet so long as each article requiring each such addition is clearly indicated.

The foregoing amendment will become effective when these articles of amendment are filed in accordance with Chapter 180, Section 7 of the General Laws unless these articles specify, in accordance with the vote adopting the amendment, a later effective date not more than thirty days after such filing, in which event the amendment will become effective on such later date.

IN WITNESS WHEREOF AND UNDER THE PENALTIES OF PERJURY, we have hereto signed our names this 18th day of March, in the year 1994

H. Richard Nesson ..... President/~~Vice President~~

..... Clerk/~~Assistant Clerk~~

459052

SECRETARY OF STATE
RECEIVED

1994 MAR 18 PM 4:10

CORPORATION DIVISION

THE COMMONWEALTH OF MASSACHUSETTS

ARTICLES OF AMENDMENT

(General Laws, Chapter 180, Section 7)

I hereby approve the within articles of amendment and, the filing fee in the amount of $ 15 having been paid, said articles are deemed to have been filed with me this 18th day of March, 1994

Michael Joseph Connolly

MICHAEL J. CONNOLLY

Secretary of State

TO BE FILLED IN BY CORPORATION

PHOTO COPY OF AMENDMENT TO BE SENT

TO: John E. Beard

Ropes & Gray

One International Place, Boston 02110

Telephone 617-951-7411

Copy Mailed

FEDERAL IDENTIFICATION NO. 04-2303535
Fee: $15.00

Examiner

The Commonwealth of Massachusetts

William Francis Galvin
Secretary of the Commonwealth
One Ashburton Place, Boston, Massachusetts 02108-1512

Name Approved

ARTICLES OF AMENDMENT
(General Laws, Chapter 180, Section 7)

We, Samuel O. Thier, M.D., *President / ~~Vice President~~,

and Ernest M. Haddad, Secretary ~~Assistant Secretary~~,

of Partners HealthCare System, Inc.,
(Exact name of corporation)

located at 800 Boylston Street, Suite 1150, Boston, MA 02199,
(Address of corporation in Massachusetts)

do hereby certify that these Articles of Amendment affecting articles numbered:

II and IV
(Number those articles 1, 2, 3, and/or 4 being amended)

of the Articles of Organization were duly adopted at a meeting held on May 4, 1998, by vote of:

277 members, ~~of the directors~~ ~~shareholders~~

being at least two-thirds of its members/directors legally qualified to vote in meetings of the corporation ~~(or, if applicable, the holders of at least two-thirds of the capital stock having the right to vote)~~

1. Delete Article II and insert in place thereof the following:

Article II

(i) To organize, operate and support a comprehensive health care system, including without limitation hospital and other health care services for all persons, and education and research for the prevention, diagnosis, treatment and cure of all forms of human illness: (ii) to improve the health and welfare of all persons: (iii) to operate for the benefit of and to support The Massachusetts General Hospital, The Brigham Medical Center, Inc., The North Shore Medical Center, Inc., their respective affiliated corporations, such other hospitals, charitable, scientific or educational organizations, and their affiliated corporations that become affiliated with Partners HealthCare System, Inc.

C ☐
P ☐
M ☐
R.A. ☐

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P.C.

*~~Delete the inapplicable words.~~
Note: If the space provided under any article or item on this form is insufficient, additions shall be set forth on one side only of separate 8 1/2 x 11 sheets of paper with a left margin of at least 1 inch. Additions to more than one article may be made on a single sheet so long as each article requiring each addition is clearly indicated.

(collectively, the "Partners Affiliated Corporations") and such other charitable, scientific or educational organizations which are or are affiliated with teaching hospitals in the Greater Boston Area; and (iv) to carry on any other activity that may lawfully be carried on by a corporation formed under Chapter 180 of the Massachusetts General Laws which is exempt under Section 501(c)(3) of the Internal Revenue Code; and in furtherance of the foregoing purposes to:

(a) Serve as the controlling and coordinating organization for the Partners Affiliated Corporations in order to assure the consistency and appropriateness of their respective missions, activities, governance and administration;

(b) Solicit and receive devises of real property and grants, donations and bequests of money and other property to be used to further the foregoing purposes and those of the Partners Affiliated Corporations; and

(c) Support the Partners Affiliated Corporations by loan, lease or donation of funds or other assets, by guaranty of obligations or by other action.

2. Delete Section 4.5. of Article IV.

The foregoing amendment(s) will become effective when these Articles of Amendment are filed in accordance with General Laws, Chapter 180, Section 7 unless these articles specify, in accordance with the vote adopting the amendment, a *later* effective date not more than *thirty days* after such filing, in which event the amendment will become effective on such later date.

[redacted]: _____

SIGNED UNDER THE PENALTIES OF PERJURY, this 29TH day of May, 1998,

_____, *President [redacted]

_____, Secretary
*[redacted]

*Delete the inapplicable words.

THE COMMONWEALTH OF MASSACHUSETTS

ARTICLES OF AMENDMENT

(General Laws, Chapter 180, Section 7)

S19710

SECRETARY OF THE COMMONWEALTH
98 JUN -2 AM 9:52

I hereby approve the within Articles of Amendment and, the filing fee in the amount of $ 150.00 having been paid, said articles are deemed to have been filed with me this 2nd day of June 19 98.

Effective date: _____

William Francis Galvin

WILLIAM FRANCIS GALVIN

Secretary of the Commonwealth

TO BE FILLED IN BY CORPORATION
Photocopy of document to be sent to:

Ernest M. Haddad, Esq.
Partners HealthCare System, Inc.
800 Boylston Street, Ste. 1150
Boston, MA 02199

Telephone: (617) 278-1065

AACR.6

FEDERAL IDENTIFICATION NO. 043230035 V
Fee: $15.00

Examiner

N/A
Name Approved

The Commonwealth of Massachusetts

William Francis Galvin
Secretary of the Commonwealth
One Ashburton Place, Boston, Massachusetts 02108-1512

ARTICLES OF AMENDMENT
(General Laws, Chapter 180, Section 7)

042

We, Samuel O. Thier, M.D. , *President / ~~Vice President~~,

and Ernest M. Haddad , Secretary ~~Clerk / Assistant Clerk~~,

of Partners HealthCare System, Inc. ,
(Exact name of corporation)

located at 800 Boylston Street, Suite 1150, Boston, MA 02199 ,
(Address of corporation in Massachusetts)

do hereby certify that these Articles of Amendment affecting articles numbered:

II
(Number those articles 1, 2, 3, and/or 4 being amended)

of the Articles of Organization were duly adopted at a meeting held on May 3 19 99 , by vote of:

293 members, ~~xxxxxxxxxxxxxxxxx directors or xxxxxxxxxxxxxxxx shareholders~~;

being at least two-thirds of its members/directors legally qualified to vote in meetings of the corporation~~xxxx~~ ~~In the case of a corporation having capital stock, by the holders of at least two-thirds of the capital stock having the right to vote thereon~~)~~x~~

Delete Article II and insert in place thereof the following:

Article II

The purpose of the corporation is to engage in the following activities:

(i) To organize, operate, coordinate and support a comprehensive integrated health care delivery system (the "System") that provides, without limitation, hospital, physician and other health care services for all persons and education and research for the prevention, diagnosis, treatment and cure of all forms of human illness; (ii) to improve the health and welfare of all persons; (iii) to serve as the controlling and coordinating organization for the System and its member institutions and entities including Brigham and Women's/Faulkner Hospitals, Inc., The Massachusetts General Hospital, The North Shore Medical Center, Inc., Newton-Wellesley Health Care System, Inc., and such other hospital, physician, charitable, scientific, educational,

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P ☐
M ☐
R.A. ☐

3

**Delete the inapplicable words.*
Note: If the space provided under any article or item on this form is insufficient, additions shall be set forth on one side only of separate 8 1/2 x 11 sheets of paper with a left margin of at least 1 inch. Additions to more than one article may be made on a single sheet so long as each article requiring each addition is clearly indicated.

research and other institutions and entities that are controlled, directly or indirectly, through sole corporate membership, stock ownership or otherwise, by the Corporation (collectively, the "Affiliated Organizations"); (iv) to assist and support the Affiliated Organizations in fulfilling their respective purposes, missions and objectives in a manner consistent with the purposes, missions and objectives of the Corporation and the System; and (v) to carry on any other activity that may lawfully be carried on by a corporation formed under Chapter 180 of the Massachusetts General Laws which is exempt under Section 501(c)(3) of the Internal Revenue Code; and in furtherance of the foregoing purposes to:

(a) Solicit and receive devises of real property and grants, donations and bequests of money and other property to be used to further the foregoing purposes; and

(b) Support the Affiliated Organizations by loan; lease or donation of funds or other assets; and

(c) Support the Affiliated Organizations by guaranty of the obligations of the Affiliated Organizations or by other action.

The foregoing amendment(s) will become effective when these Articles of Amendment are filed in accordance with General Laws, Chapter 180, Section 7 unless these articles specify, in accordance with the vote adopting the amendment, a *later* effective date not more than *thirty days* after such filing, in which event the amendment will become effective on such later date.

~~Later effective date: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx~~

SIGNED UNDER THE PENALTIES OF PERJURY, this 24th day of May, 19 99,

Paul O Ober, ~~*President/Vice President~~

David M Haddad, Secretary ~~*Clerk/*Assistant Clerk~~

*Delete the inapplicable words.

660922

THE COMMONWEALTH OF MASSACHUSETTS

ARTICLES OF AMENDMENT

(General Laws, Chapter 180, Section 7)

I hereby approve the within Articles of Amendment and, the filing fee in the amount of $ 15.00 having been paid, said articles are deemed to have been filed with me this 26th day of May 19 99.

99 MAY 26 AM 9:24

Effective date: _____

William Francis Galvin

WILLIAM FRANCIS GALVIN

Secretary of the Commonwealth

TO BE FILLED IN BY CORPORATION

Photocopy of document to be sent to:

Mary LaLonde

Partners HealthCare System

Office of the General Counsel
50 Staniford St., 10th floor
Boston, MA 02114

Telephone: 617-726-5315

The Commonwealth of Massachusetts
William Francis Galvin

Minimum Fee: $15.00

Secretary of the Commonwealth, Corporations Division
One Ashburton Place, 17th floor
Boston, MA 02108-1512
Telephone: (617) 727-9640

Articles of Amendment
(General Laws, Chapter 180, Section 7)

Identification Number: 043230035

We, BRENT L. HENRY __ **President** X **Vice President,**

and MARY C. LALONDE __ **Clerk** X **Assistant Clerk ,**

of PARTNERS HEALTHCARE SYSTEM, INC.
located at: 800 BOYLSTON ST., SUITE 1150 BOSTON , MA 02199 USA

do hereby certify that these Articles of Amendment affecting articles numbered:

__ Article 1 X Article 2 __ Article 3 __ Article 4

(Select those articles 1, 2, 3, and/or 4 that are being amended)

of the Articles of Organization were duly adopted at a meeting held on 4/19/2016 , by vote of: 197 members, 0 directors, or 0 shareholders,
being at least two-thirds of its members/directors legally qualified to vote in meetings of the corporation (or, in the case of a corporation having capital stock, by the holders of at least two thirds of the capital stock having the right to vote therein):

ARTICLE I

The exact name of the corporation, ***as amended,*** is:
(Do not state Article I if it has not been amended.)

ARTICLE II

The purpose of the corporation, ***as amended,*** is to engage in the following business activities:
(Do not state Article II if it has not been amended.)

THE PURPOSE OF THE CORPORATION IS TO ENGAGE IN THE FOLLOWING ACTIVITIES: (I) TO ORGANIZE, OPERATE, COORDINATE AND SUPPORT A COMPREHENSIVE INTEGRATED HEAL TH CARE DELIVERY SYSTEM (THE "SYSTEM") THAT PROVIDES, WITHOUT LIMITATION, HOS PITAL, PHYSICIAN AND OTHER HEALTH CARE SERVICES FOR ALL PERSONS AND EDUCATI ON AND RESEARCH FOR THE PREVENTION, DIAGNOSIS, TREATMENT AND CURE OF ALL FO RMS OF HUMAN ILLNESS; (II) TO IMPROVE THE HEALTH AND WELFARE OF ALL PERSONS A ND TO CONDUCT AND SUPPORT EDUCATION, RESEARCH AND OTHER ACTIVITIES RELATIN G THERE TO, (III) TO SERVE AS THE CONTROLLING AND COORDINATING ORGANIZATION F OR THE SYSTEM AND ITS MEMBER INSTITUTIONS AND ENTITIES INCLUDING BRIGHAM AN D WOMEN'S HEALTH CARE, INC., THE MASSACHUSETTS GENERAL HOSPITAL, NSMC HEALT HCARE, INC., NEWTON WELLESLEY HEALTH CARE SYSTEM, INC., PARTNERS COMMUNITY PHYSICIANS ORGANIZATION, INC., PARTNERS CONTINUING CARE, INC., NEIGHBORHOOD HEALTH PLAN, INC. AND SUCH OTHER HOSPITAL, PHYSICIAN, CHARITABLE, SCIENTIFIC, E

DUCATIONAL, RESEARCH AND OTHER INSTITUTIONS AND ENTITIES THAT ARE CONTROLLED, DIRECTLY OR INDIRECTLY, THROUGH SOLE CORPORATE MEMBERSHIP, STOCK OWNERSHIP OR OTHERWISE, BY THE CORPORATION (COLLECTIVELY, THE "AFFILIATED ORGANIZATIONS"); (IV) TO ASSIST AND SUPPORT THE AFFILIATED ORGANIZATIONS IN FULFILLING THEIR RESPECTIVE PURPOSES, MISSIONS AND OBJECTIVES IN A MANNER CONSISTENT WITH THE PURPOSES, MISSIONS AND OBJECTIVES OF THE CORPORATION AND THE SYSTEM; AND (V) TO CARRY ON ANY OTHER ACTIVITY THAT MAY LAWFULLY BE CARRIED ON BY A CORPORATION FORMED UNDER CHAPTER 180 OF THE MASSACHUSETTS GENERAL LAWS WHICH IS EXEMPT UNDER SECTION 501(C)(3) OF THE INTERNAL REVENUE CODE; AND IN FURTHERANCE OF THE FOREGOING PURPOSES TO: (A) SOLICIT AND RECEIVE DEVISES OF REAL PROPERTY AND GRANTS, DONATIONS AND BEQUESTS OF MONEY AND OTHER PROPERTY TO BE USED TO FURTHER THE FOREGOING PURPOSES; AND (B) SUPPORT THE AFFILIATED ORGANIZATIONS BY LOAN, LEASE OR DONATION OF FUNDS OR OTHER ASSETS; AND (C) SUPPORT THE AFFILIATED ORGANIZATIONS BY GUARANTY OF THE OBLIGATIONS OF THE AFFILIATED ORGANIZATIONS OR BY OTHER ACTION.

ARTICLE III

A corporation may have one or more classes of members. ***As amended,*** the designation of such classes, the manner of election or appointments, the duration of membership and the qualifications and rights, including voting rights, of the members of each class, may be set forth in the by-laws of the corporation or may be set forth below:

ARTICLE IV

As amended, other lawful provisions, if any, for the conduct and regulation of the business and affairs of the corporation, for its voluntary dissolution, or for limiting, defining, or regulating the powers of the business entity, or of its directors or members, or of any class of members, are as follows:
(If there are no provisions state "NONE")

The foregoing amendment(s) will become effective when these Articles of Amendment are filed in accordance with General Laws, Chapter 180, Section 7 unless these articles specify, in accordance with the vote adopting the amendment, a *later* effective date not more than *thirty days* after such filing, in which event the amendment will become effective on such later date.

Later Effective Date:

Signed under the penalties of perjury, this 20 Day of April, 2016, BRENT L. HENRY , its , President / Vice President,
MARY C. LALONDE , Clerk / Assistant Clerk.

THE COMMONWEALTH OF MASSACHUSETTS

I hereby certify that, upon examination of this document, duly submitted to me, it appears that the provisions of the General Laws relative to corporations have been complied with, and I hereby approve said articles; and the filing fee having been paid, said articles are deemed to have been filed with me on:

April 20, 2016 04:09 PM

WILLIAM FRANCIS GALVIN

Secretary of the Commonwealth

Attachment/Exhibit

9

Massachusetts Department of Public Health
Determination of Need
Affidavit of Truthfulness and Compliance with Law and Disclosure Form 100.405(B)

Version: 7-6-17

Instructions: Complete information below. When complete check the box "This document is ready to print:". This will date stamp and lock the form. Print Form. Each person must sign and date the form. When all signatures have been collected, scan the document and e-mail to: **dph.don@state.ma.us** Include all attachments as requested.

Application Number: PHS-19040915-HE

Original Application Date: 04/26/2019

Applicant Name: Partners HealthCare System, Inc.

Application Type: Hospital/Clinic Substantial Capital Expenditure

Applicant's Business Type: (•) Corporation ( ) Limited Partnership ( ) Partnership ( ) Trust ( ) LLC ( ) Other

Is the Applicant the sole member or sole shareholder of the Health Facility(ies) that are the subject of this Application? (•) Yes ( ) No

The undersigned certifies under the pains and penalties of perjury:

1. The Applicant is the sole corporate member or sole shareholder of the Health Facility[ies] that are the subject of this Application;
2. I have* ~~read~~ 105 CMR 100.000, the Massachusetts Determination of Need Regulation;
3. I understand and agree to the expected and appropriate conduct of the Applicant pursuant to 105 CMR 100.800;
4. I have* ~~read~~ this application for Determination of Need including all exhibits and attachments, and ~~certify that~~** all of the information contained herein is accurate and true;
5. I have submitted the correct Filing Fee and understand it is nonrefundable pursuant to 105 CMR 100.405(B);
6. I have submitted the required copies of this application to the Determination of Need Program, and, as applicable, to all Parties of Record and other parties as required pursuant to 105 CMR 100.405(B);
7. I have caused, as required, notices of intent to be published and duplicate copies to be submitted to all Parties of Record, and all carriers or third-party administrators, public and commercial, for the payment of health care services with which the Applicant contracts, and with Medicare and Medicaid, as required by 105 CMR 100.405(C), et seq.;
8. I ~~have caused~~** proper notification and submissions to the Secretary of Environmental Affairs pursuant to 105 CMR 100.405(E) and 301 CMR 11.00; will be made if applicable
9. If subject to M.G.L. c. 6D, § 13 and 958 CMR 7.00, I have submitted such Notice of Material Change to the HPC - in accordance with 105 CMR 100.405(G);
10. Pursuant to 105 CMR 100.210(A)(3), I certify that both the Applicant and the Proposed Project are in material and substantial compliance and good standing with relevant federal, state, and local laws and regulations, as well as with all ~~previously issued~~ Notices of Determination of Need~~ and the terms and Conditions attached therein~~;***
11. I have* ~~read~~ and understand the limitations on solicitation of funding from the general public prior to receiving a Notice of Determination of Need as established in 105 CMR 100.415;
12. I understand that, if Approved, the Applicant, as Holder of the DoN, shall become obligated to all Standard Conditions pursuant to 105 CMR 100.310, as well as any applicable Other Conditions as outlined within 105 CMR 100.000 or that otherwise become a part of the Final Action pursuant to 105 CMR 100.360;
13. Pursuant to 105 CMR 100.705(A), I certify that the Applicant has Sufficient Interest in the Site or facility; and
14. Pursuant to 105 CMR 100.705(A), I certify that the Proposed Project is authorized under applicable zoning by-laws or ordinances, whether or not a special permit is required; or,
    a. If the Proposed Project is not authorized under applicable zoning by-laws or ordinances, a variance has been received to permit such Proposed Project; or,
    b. The Proposed Project is exempt from zoning by-laws or ordinances.

Corporation:

Attach a copy of Articles of Organization/Incorporation, as amended

Anne Klibanski, MD — Signature: _____ Date _____

Acting CEO and President for Corporation Name: Scott M. Sperling — Signature: _____ Date _____

Board Chair for Corporation Name: — Signature: — Date

*been informed of the contents of
**have been informed that
***issued in compliance with 105 CMR 100.00, the Massachusetts Determination of Need Regulation effective January 27, 2017 and amended December 28, 2018

Massachusetts Department of Public Health
Determination of Need
Affidavit of Truthfulness and Compliance with Law and Disclosure Form 100.405(B)

Version: 7-6-17

Instructions: Complete information below. When complete check the box "This document is ready to print:". This will date stamp and lock the form. Print Form. Each person must sign and date the form. When all signatures have been collected, scan the document and e-mail to: **dph.don@state.ma.us** Include all attachments as requested.

Application Number: PHS-19040915-HE

Original Application Date: 04/26/2019

Applicant Name: Partners HealthCare System, Inc.

Application Type: Hospital/Clinic Substantial Capital Expenditure

Applicant's Business Type: (•) Corporation ( ) Limited Partnership ( ) Partnership ( ) Trust ( ) LLC ( ) Other

Is the Applicant the sole member or sole shareholder of the Health Facility(ies) that are the subject of this Application? (•) Yes ( ) No

The undersigned certifies under the pains and penalties of perjury:

1. The Applicant is the sole corporate member or sole shareholder of the Health Facility[ies] that are the subject of this Application;
2. I have* ~~read~~ 105 CMR 100.000, the Massachusetts Determination of Need Regulation;
3. I understand and agree to the expected and appropriate conduct of the Applicant pursuant to 105 CMR 100.800;
4. I have* ~~read~~ this application for Determination of Need including all exhibits and attachments, and** ~~certify that~~ all of the information contained herein is accurate and true;
5. I have submitted the correct Filing Fee and understand it is nonrefundable pursuant to 105 CMR 100.405(B);
6. I have submitted the required copies of this application to the Determination of Need Program, and, as applicable, to all Parties of Record and other parties as required pursuant to 105 CMR 100.405(B);
7. I have caused, as required, notices of intent to be published and duplicate copies to be submitted to all Parties of Record, and all carriers or third-party administrators, public and commercial, for the payment of health care services with which the Applicant contracts, and with Medicare and Medicaid, as required by 105 CMR 100.405(C), et seq.;
8. I** ~~have caused~~ proper notification and submissions to the Secretary of Environmental Affairs pursuant to 105 CMR 100.405(E) and 301 CMR 11.00; will be made if applicable
9. If subject to M.G.L. c. 6D, § 13 and 958 CMR 7.00, I have submitted such Notice of Material Change to the HPC - in accordance with 105 CMR 100.405(G);
10. Pursuant to 105 CMR 100.210(A)(3), I certify that both the Applicant and the Proposed Project are in material and substantial compliance and good standing with relevant federal, state, and local laws and regulations, as well as with all ~~previously issued~~ Notices of Determination of Need*** ~~and the terms and Conditions attached therein;~~
11. I have* ~~read~~ and understand the limitations on solicitation of funding from the general public prior to receiving a Notice of Determination of Need as established in 105 CMR 100.415;
12. I understand that, if Approved, the Applicant, as Holder of the DoN, shall become obligated to all Standard Conditions pursuant to 105 CMR 100.310, as well as any applicable Other Conditions as outlined within 105 CMR 100.000 or that otherwise become a part of the Final Action pursuant to 105 CMR 100.360;
13. Pursuant to 105 CMR 100.705(A), I certify that the Applicant has Sufficient Interest in the Site or facility; and
14. Pursuant to 105 CMR 100.705(A), I certify that the Proposed Project is authorized under applicable zoning by-laws or ordinances, whether or not a special permit is required; or,
    a. If the Proposed Project is not authorized under applicable zoning by-laws or ordinances, a variance has been received to permit such Proposed Project; or,
    b. The Proposed Project is exempt from zoning by-laws or ordinances.

Corporation:

Attach a copy of Articles of Organization/Incorporation, as amended

Anne Klibanski, MD	Signature:	4/25/19
Acting CEO and President for Corporation Name: Scott M. Sperling		
Board Chair for Corporation Name:	Signature:	Date

*been informed of the contents of
**have been informed that
***issued in compliance with 105 CMR 100.00, the Massachusetts Determination of Need Regulation effective January 27, 2017 and amended December 28, 2018

Attachment/Exhibit

10

DATE					CHECK NO
04/08/2019					0006021157
VOUCHER INVOICE NUMBER	INVOICE DATE	PO NUMBER	GROSS AMOUNT	DISCOUNT	NET AMOUNT
27710652 MGH-DON-MARCH2019	03/31/2019		204,409.39	0.00	204,409.39
MGH Planning & Construction, 16 Blossom St., West End					

MM Client Services (617) 726-2142	AP	1200	MG1434	716545	TOTAL AMOUNT	DISCOUNT	NET AMOUNT
					204,409.39	0.00	204,409.39

To Remove Document Fold and Tear Along This Perforation

VERIFY THE AUTHENTICITY OF THIS MULTI-TONE SECURITY DOCUMENT. CHECK BACKGROUND AREA CHANGES COLOR GRADUALLY FROM TOP TO BOTTOM.

PARTNERS. HealthCare

Bank of America, N.A.
South Portland,ME

52-153
112 ME

DATE
04/08/2019

0006021157

AMOUNT
$204,409.39

PAY **Two Hundred Four Thousand Four Hundred Nine and 39/100 Dollars**

TO THE ORDER OF **COMMONWEALTH OF MASSACHUSETTS**
DPH DIV OF HEALTH CARE QUALITY
99 CHAUNCY STREET 11TH FLOOR
BOSTON MA

AUTHORIZED SIGNATURE

VOID IF NOT CASHED WITHIN 90 DAYS

[redacted]

See Reverse Side For Easy Opening Instructions

PARTNERS. P.O. Box 9127
Boston, MA 02129-9127

COMMONWEALTH OF MASSACHUSETTS
DPH DIV OF HEALTH CARE QUALITY
99 CHAUNCY STREET 11TH FLOOR
BOSTON MA 02111

Attachment/Exhibit

11

The Commonwealth of Massachusetts
HEALTH POLICY COMMISSION
50 MILK STREET, 8TH FLOOR
BOSTON, MASSACHUSETTS 02109
(617) 979-1400

STUART H. ALTMAN
CHAIR

DAVID M. SELTZ
EXECUTIVE DIRECTOR

December 29, 2017

Sree Chaguturu
Partners HealthCare System, Inc.
800 Boylston Street, 11th Floor
Boston, MA 02199

RE: ACO Certification

Dear Dr. Chaguturu:

Congratulations! The Health Policy Commission (HPC) is pleased to inform you that Partners HealthCare System, Inc. meets the requirements for ACO Certification. This certification is effective from the date of this letter through December 31, 2019.

The ACO Certification program, in alignment with other state agencies including MassHealth, is designed to accelerate care delivery transformation in Massachusetts and promote a high quality, efficient health system. ACOs participating in the program have met a set of objective criteria focused on core ACO capabilities including supporting patient-centered care and governance, using data to drive quality improvement, and investing in population health. Partners Healthcare System, Inc. meets those criteria.

The HPC will promote Partners HealthCare System, Inc. as a Certified ACO on our website and in our marketing and public materials. In addition, a logo is enclosed for your use in accordance with the attached Terms of Use. We hope you will use the logo to highlight the ACO Certification to your patients, payers, and others.

The HPC looks forward to your continued engagement in the ACO Certification program over the next two years. In early 2018, HPC staff will contact you to discuss any updates to your submission and to plan a site visit for later in the year.

Thank you for your dedication to providing accountable, coordinated health care to your patients. If you have any questions about this letter or the ACO Certification program, please do not hesitate to contact Catherine Harrison, Deputy Policy Director, at HPC-Certification@state.ma.us or (617) 757-1606.

Best wishes,

David Seltz
Executive Director