

Questions for PHS Brigham and Women's Capital Expansion and Required Equipment Project

DON # PHS-17111513-HE

3.a. How was the need for the size and number of bays determined? What will the impact be of the increased size and how will it be measured?

In consultation with an ED strategic planning consultant, the hospital determined the appropriate size and number of bays by analyzing historical volume trends, knowing that the ED is currently undersized for meeting current visit demand. Evidence that the current ED is not appropriately sized to meet demand is shown in the need for frequent provision of care in hallway areas and implementation of surge space in daily operations. As discussed in the Application, the hospital projects modest growth in demand in the first year that is consistent with historical annual rates of volume increases and thereafter, the hospital projects a modest 1% annual growth trend.

The impact of the increased size may be measured by the following metrics provided in the Application:

1. **Access Measure – Walk-Out Rate:** As previously discussed, given overcrowding issues, BWH experienced a walk-out rate of 2.78% in FY16, with an increased rate over the last two years. Through a redesigned physical space and new patient throughput processes, BWH will be able to move patients to exam rooms more quickly, reducing wait time, overcrowding and the walk-out rate.

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

Projections: Baseline: 2.78%; Year 1: 1.20%; Year 2: 1.18%; and Year 3: 1.16%

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

Measure: The amount of time it takes between a patient registering in the ED to being seen by a treating clinician

Projections: Baseline: 24 minutes; Year 1: 15 minutes; Year 2: 15 minutes; and Year 3: 15 minutes

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

3. **Process Measure – The Amount of Care Provided Outside of an ED bay:** Currently, approximately 17% of care within BWH's ED is provided in areas outside of formal exam bays. This measure will be evaluated to determine the impact of the redesigned space and patient flow on overcrowding.

Measure: The number of times care is provided outside of an ED bay.

Projections: Baseline: 16.52%; Year 1: 8.00%; Year 2: 5.00%; and Year 3: 5.00%

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

7. In terms of Public Health Value for the MRI Simulator and LINAC- please explain the incidence rates regarding radiation therapy related toxicity and burns now and their cost impacts. Will you be able to measure and report on this?

Radiation therapy-related toxicity rates and type of toxicity vary based on the location and dose of radiation delivered. Some examples of common toxicities include nausea/vomiting/diarrhea, which can lead to increased cost of care due to hospitalization for patients with abdominal malignancies, and late fibrosis of soft tissues causing chronic swallowing dysfunction in patients with head and neck cancers receiving radiation therapy.

Currently, the hospital measures the impact of these toxicities on patient quality of life (QoL) by collecting validated patient-reported outcome measures (PROMS) from all patients treated in the BWH Department of Radiation Oncology before, during and after radiation therapy. The patient reported outcome measures are tailored to each disease site to appropriately measure the toxicity impact of radiation therapy for a given cancer. We thus have baseline data on thousands of patients with >20,000 QoL data points collected to date, which provides the hospital's center with a baseline of toxicity rates using conventional simulators and conventional linacs that can be compared to rates experienced from treatment with the proposed MRI simulator and MRI LINAC. A comparison of QoL between the conventional and MRI-based radiation therapy will allow the hospital to quantify the quality-adjusted life years benefits from toxicity reduction.

Although difficult to measure avoided costs, with an integrated medical record system across Partners, the hospital can track and estimate the difference in costs related to post-radiation therapy complication management for a given cancer diagnosis.

9 Please expand on your Factor 5 explanation of alternatives considered. What other efficiency measures have been taken to improve throughput and gain efficiencies in the ED other than to reduce the walk out rate by treating patients in the hallways.

The hospital has initiated several other ongoing interdepartmental and interdisciplinary operational projects aimed at gaining efficiencies and improving overall patient throughput. The hospital's focus on reducing ED walkouts through maximizing surge spaces into daily operations has been fully implemented and successful as a temporizing measure until additional rooms become available through the proposed project. This success also supports the need to increase the ED's physical footprint to accommodate both current and future volume needs. We have several other ongoing and planned throughput initiatives.

For example, one of the major process change initiatives that has been implemented is to improve throughput for ED Observation patients. The hospital has implemented a multidisciplinary approach to reducing time for patient movement from the ED treatment bays

to ED Observation units. The hospital is focused on reducing the time interval between the ED Observation bed request to patient arrival on an observation unit. In doing this, it opens capacity for incoming emergency patients. The ED clinical leadership has reviewed the operational processes associated with each major sub-interval, including bed request to bed assign, bed assign to handoff completion, and handoff completion to arrival on observation unit and determined where there are areas of opportunity in each interval to reduce the patient movement interval overall. The first sub-interval focuses on the “just in time” bed request by the provider and timely bed assignment, which also acts as a measurable surrogate for disposition decision. The second and third sub-interval focus was around the opportunity to incorporate parallel processing into the current serial processes. To do this staff worked on reducing the time to verbal handoff through direct communication of bed assignments to the provider groups. In addition, transport was initiated at the time of bed assignment as an impetus for clinicians to expedite handoff and improve throughput by combining the second and third sub-intervals into parallels to reduce the intervals overall. The hospital has seen moderate success with this initiative, with a goal target to meet the 80th percentile. Prior to the start of implementation, the hospital typically met the goal between the 20th and 30th percentile and since implementation the metrics have reached the 40th to the 50th percentile. Operationally, what this means to the throughput of the department is reducing the amount of time that a patient remains in the ED and ED Observation bed assignment. During this period the patient is essentially occupying two beds and the reduction in this interval increases the capacity for earlier initiation of care of incoming emergency patients.

A second example is the ED’s ongoing work with its clinical pathology lab colleagues to reduce lab turnaround time. Through focused workflow changes and efficiencies in the core lab the ED has been able to reduce the turnaround of urine pregnancy to a sustained median of 6 minutes, where historically regular turnaround was in the 30 to 60-minute range. Currently, the ED is working on a broader project to reduce lab turnaround time with infrastructure and workflow changes to reduce the turnaround time for a battery of common labs needed for emergency patients. In addition to reducing lab turnaround, the hospital expects that this will reduce the interval between when care is initiated and a disposition decision is made.

10. Please explain how you will measure and track improved continuity and coordination of care described in F1.c of your Application.

For ED: The hospital may track the rate of ambulatory referral “success” post-discharge from the ED, as well as and “no show” rates to ambulatory referrals. This measure may indicate how successful post-ED visit linkages to care are implemented. Also, the hospital tracks its 72-hour ED revisit rate, 14-day ED observation revisit rate, which are both indirectly impacted by continuity and connected post-visit care.

For the MRI Simulator and MRI Linac: The hospital will measure continuity and coordination of care using BWH’s electronic health record (“EHR”) to share images and provide follow-up information to a patient’s medical oncologist and primary care physician. Currently, at the completion of radiation therapy, the radiation oncologist is required to document a radiation therapy summary note in the EHR, which includes details regarding treatment technique, dose, patient tolerance /toxicity, and a follow-up plan (including return visits with other cancer specialists). These notes are distributed by the radiation oncologists via the EHR to primary

care physician, referring physicians, and other cancer specialists, and the EHR will also allow the department to track compliance of this critical coordination of care with patients treated on the MRI-guided radiation therapy program.

Another continuity of care metric that the department will use, as described in F.1.b.ii, is the ability of the MRI-simulator to consolidate care in a single Department (and in a single day visit) for cancer patients. The department will be able to compare its existing MRI utilization (which involves patients obtaining a MRI scan at another department or institution and then traveling to the Department of Radiation Oncology for consultation and simulation). With a dedicated MRI Simulator in the Department of Radiation Oncology, the hospital will be able to provide patients with a single visit location to have a consultation with the radiation oncologist and MRI simulation for radiation planning. This can be measured through the proportion of clinically eligible patients whose treatment was planned on the RT-MRI simulator as part of same-day radiation planning compared to number of patients who had treatment planning on a traditional MRI scanner, and then compare it against historical data.

For the 7T MRI: The radiology department will measure continuity and coordination of care using BWH's EHR to provide access to images and the professional interpretative reports created by Brigham radiologists for all examinations performed using the 7T MRI to the referring physician and the patient's care team. For all radiologic imaging modalities (including the 7T MRI) and environments (inpatient, outpatient and emergency department) and locations, timeliness of access for care providers to patients' finalized diagnostic radiology reports in the EHR is a key measure of quality and safety, and serves the key metric for care continuity and coordination. The department measures and reports on this timeliness on a weekly basis through an automated dashboard, with reports reviewed by radiology and hospital administration. As of April 2017, Brigham Health adopted a performance target for this metric requiring report signature time of 6 hours or less for at least 90% of all reports. The performance by each radiologist is posted monthly and direct feedback is provided by the Radiology Vice Chair for Quality and Safety to each radiologist who misses the target in any month, with escalation to the Radiology Chair as needed. The dashboard of metrics is available to all physicians in the department, as well as radiology and hospital administration.