PARTNERS HUMAN RESEARCH COMMITTEE
PROTOCOL SUMMARY

Answer all questions accurately and completely in order to provide the PHRC with the relevant information to assess the risk-benefit ratio for the study. Do not leave sections blank.

PRINCIPAL/OVERALL INVESTIGATOR

Jeffrey L. Schnipper, MD, MPH

PROTOCOL TITLE

Relative patient benefits of a hospital-PCMH collaboration within an ACO to improve care transitions

FUNDING

Patient-Centered Outcomes Research Institute (PCORI)

VERSION DATE

1/14/15

SPECIFIC AIMS

Concisely state the objectives of the study and the hypothesis being tested.

The specific aims of this study are:

1. To develop, implement, and refine a multi-faceted, multi-disciplinary transitions intervention with contributions from hospital and Patient-Centered Medical Home (PCMH) personnel.

Hypothesis: a collaborative transitions intervention can be designed and implemented within an ACO that reliably provides the components of an ideal transition in care.

2. To evaluate the effects of this intervention on post-discharge adverse events, functional status, patient engagement, and emergency department and hospital utilization within 30 days of discharge.

Hypothesis: compared with usual care, a collaborative transitions intervention will decrease post discharge adverse events, improve post-discharge functional status, increase patient engagement, and reduce emergency department and hospital utilization in the post-discharge period.

3. To understand barriers to and facilitators of successful implementation of this intervention across practices.

Hypothesis: several barriers to and facilitators of implementation can be identified and used to create lessons learned for other health systems to successfully implement this type of intervention.

BACKGROUND AND SIGNIFICANCE

Provide a brief paragraph summarizing prior experience important for understanding the proposed study and procedures.

Each year, there are more than 32 million adult hospitalizations in the United States. Many of these hospitalized patients suffer from chronic conditions, including 61% with 3 or more chronic conditions. Several studies have shown that an estimated 20% of hospitalized patients suffer an adverse event within 30 days of discharge. Approximately two-thirds of these events may be entirely preventable or ameliorable (i.e., reduced in severity or duration) had care been better. Moreover, it is estimated that almost 20% of Medicare patients are readmitted within 30 days of hospital discharge; the cost to Medicare of unplanned hospitalizations in 2004 was estimated at $17.4 billion. Much less studied but equally important are the effects of hospitalization on post-discharge functional and health status; symptoms such as pain and anxiety; out of pocket patient costs and economic effects of time away from work; and caregiver burden.

Multiple studies have shown that processes of care during transitions are suboptimal. For example, Forster and colleagues estimated that 59% of preventable or ameliorable post-discharge adverse events were the result of poor communication between inpatient providers and either patients or ambulatory providers Other studies have shown the generally poor quality and timeliness of discharge documentation, low patient understanding of their post-discharge plans of care or ability to carry out these plans, medication discrepancies and non-adherence after discharge, failure to follow up on test results pending at the time of discharge, failure to schedule needed follow-up appointments and tests, and lack of timely follow-up appointments with outpatient providers. Assuming that only 20% of hospital readmissions were truly preventable (a number that is vigorously debated), more than 1 million readmissions per year would be unnecessary, at a cost of over $1 billion dollars (including non-Medicare patients), in addition to over 4 million preventable or ameliorable post-discharge adverse events as a result of suboptimal transitional care.

Innovation and Potential for Improvement Through Research

Health care organizations lack sufficient information to know what actions to take to reduce readmissions, post-discharge adverse events, and improve patient outcomes after discharge. A recent systematic review of interventions hospitals could employ to reduce readmissions identified several positive studies, but also many negative studies, and there were significant barriers to understanding what works to reduce readmissions. Most of the interventions described in both positive and negative studies were multifaceted, and the authors were unable to identify which components of the interventions were most effective. Also, while several studies have identified risk factors for readmission, few have identified which subgroups of patients benefit most from specific interventions. Finally, few studies have described key contextual factors that lead to successful or failed implementation or the fidelity with which the intervention was implemented.

One promising development in health care reform efforts is the advent of Accountable Care Organizations (ACOs), “groups of doctors, hospitals, and other health care providers who come together voluntarily to give coordinated high quality care to their patients”. Another development is the Patient-Centered Medical Home (PCMH), consisting of patient-oriented, comprehensive team-based care enhanced by health information technology (HIT) and population-based disease management tools. Hospitals and PCMH clinics within ACOs are increasing in number, and both have a vested interest in improving transitions and preventing readmissions. To date, few care transitions initiatives have leveraged this alignment of incentives. Moreover, it is likely that hospital-PCMH collaboration can improve the efficacy of transitional interventions since:

- Optimal communication and collaboration on a discharge plan are more likely when both inpatient providers and clinicians within PCMHs are similarly motivated.
- Continuity of care is improved when PCMH personnel have more availability to contact the patient in the hospital and see the patient shortly after discharge.

As ACOs and PCMHs become more common, it is important to understand how interventions that include both hospital and PCMH personnel may promote optimal transitions for patients. Such interventions are novel, since most interventions studied to date derive either from hospitals or from ambulatory clinics, but rarely from both. Rigorous evidence that quantifies the effects of this type of intervention on important patient outcomes should influence their adoption among health care leaders. If beneficial, the widespread adoption of these interventions would have a large effect on patient outcomes and on health care performance.

Because we plan to use mixed methods to determine barriers to and facilitators of implementation across multiple units at two hospitals involving patients from dozens of PCMH practices, the lessons learned from this study should rapidly lead to the ability to implement these interventions at other similarly organized institutions. Moreover, even if the intervention is shown not to be effective, an in-depth analysis of adverse events and readmissions that occur despite use of the intervention should enable health care leaders and researchers to design future interventions that are more effective.

Increasingly, patients will need to decide which health care organizations to join or affiliate with (for example, PCMHs). While the impact of this intervention on post-discharge outcomes may be only one of several factors helping patients make this decision, it could be a particularly large impact for certain patients, e.g., those who are frequently hospitalized, those shown in our subgroup analyses to benefit most from the intervention.

Impact on Health Care Performance

The findings of our study will improve the evidence base regarding the impact of transitional interventions, facilitated by ACO-PCMH arrangements, on patient outcomes after hospital discharge. If shown to be effective, the study will also provide valuable lessons for how best to implement this type of intervention. The extent of dissemination will depend in part on the number of health care organizations arranged as ACOs and PCMHs. This number is likely to grow exponentially in the next few years as a result of rising health care costs and the Affordable Care Act. If positive, results of this study could promote hospital-PCMH collaborations. If our proposed intervention is then widely adopted, the effects could profoundly impact preventable adverse events, hospital readmissions and their attendant costs, and the overall quality and experience of care.

Relevance to Patients

Based on our clinical and research experience and on our engagement of the study's Patient and Family Advisory Council (see Patient Engagement section), patients have a vested interested in the following outcomes after hospitalization:

1. Avoidance of avoidable injury (i.e., a safe transition of care)
2. The speed and completeness of return of functional status compared with prior to hospitalization
3. Ability to return to work, if relevant
4. The extent to which they are a burden to their families and other caregivers
5. Relief from symptoms such as pain, shortness of breath, and anxiety
6. Avoidance of unnecessary health care utilization, including emergency department (ED) visits and rehospitalizations

In this study, we will directly measure the impact of our intervention on these outcomes. Moreover, through continuous patient engagement in the study, we will ensure that our interventions are patient-friendly, our outcomes patient-centered, and our dissemination plan one that maximizes benefits to patients. Finally, as noted above, our study will help patients answer the question "How can clinicians and the health care delivery systems they work in help me make the best decisions about my health and healthcare."

RESEARCH DESIGN AND METHODS

Briefly describe study design and anticipated enrollment, i.e., number of subjects to be enrolled by researchers study-wide and by Partners researchers. Provide a brief summary of the eligibility criteria (for example, age range, gender, medical condition). Include any local site restrictions, for example, "Enrollment at Partners will be limited to adults although the sponsor's protocol is open to both children and adults."

Overview:

Brigham and Women's Hospital (BWH) and Massachusetts General Hospital (MGH) will collaborate with Partners primary care practices as they become PCMH practices. In phase I, a newly designed PCMH, the Brigham and Women's South Huntington Practice (SHP), will pilot test and refine the interventions, and also pilot test our risk stratification and readmission review tools. In phase II, as practices meet PCMH "primed" criteria, they will implement the intervention after a variable amount of time, i.e., a "stepped wedge" design, in which an intervention is sequentially rolled out to different groups (i.e., different primary care practices) at different times. The order of the rollout is randomized to avoid confounding by indication (i.e., those most ready for the intervention will not necessarily get it first). Each group will have a different amount of time in the usual care and intervention arms and serve as its own control.

Inclusion Criteria:

Potential subjects will be adult patients admitted to medical and surgical services at BWH and MGH, likely to be discharged back to the community, and whose PCP belongs to one of the Partners Community Healthcare, Inc. (PCHI) primary care practices that has met "Primed" criteria for being a PCMH, admits at least 2 patients to BWH or MGH, and has agreed to participate. Primed criteria are a standard set of requirements that cover 6 essential building blocks of PCMH practices: electronic health record, patient portal, team-based care, practice redesign, care management, and identification of high-risk patients. We estimate that of the approximately 300 PCHI adult primary care practices, 150 of them will meet PCMH criteria during the study and that 18 of them will qualify and be willing to participate in the study. We estimate that 12,000 such patients will be admitted to BWH and MGH over the 18-month study period. These patients are broadly representative of hospitalized patients and include several vulnerable populations, including the elderly (33% 65 or older), patients with multiple chronic conditions (47% with Elixhauser comorbidity score 5 or more), and racial and ethnic minorities (14% African American, 13% Latino).

Exclusion Criteria:

1. Likely discharge to a location other than home (or to a caregiver's home)
2. Police custody
3. No telephone or homeless
4. Previous enrolment in the study
5. Patient unable to communicate in either English or Spanish

Briefly describe study procedures. Include any local site restrictions, for example, "Subjects enrolled at Partners will not participate in the pharmacokinetic portion of the study." Describe study endpoints.

Phase I

Risk stratification refinement

For approximately 2 months, pilot data will be collected in order to refine risk stratification and readmission review tools.

Intervention development and refinement of data collection tools:

For approximately 2 months, BWH will collaborate with SHP to develop and refine the intervention and refine the data collection tools.

Phase II

Implementing the Intervention:

The proposed intervention will combine elements of other successful care transitions initiatives, including several medication safety interventions evaluated by these investigators. The focus will be on efficient use of resources, risk stratification, optimizing communication between inpatient and outpatient teams, and implementing those interventions most likely to reduce serious adverse events:

1. Inpatient medication safety interventions: an inpatient BWH pharmacist will conduct enhanced medication reconciliation, patient counseling, and development of an illustrated pill card similar to that used in the PILL-CVD study and the IDID study. As in the latter, the intensity of the intervention will vary depending on the complexity of the patient's medication regimen, patient's understanding of his/her medications, and prior medication problems such as non-adherence or side effects.
2. Inpatient "discharge advocate": based on the role from Project RED, a nurse at each of the two hospitals will identify a "responsible outpatient clinician" ("ROC," usually an RN) from the patient's PCMH, identify all inpatient and ambulatory care team members and enter them into the Partners Enterprise Patient Lists (PEPL) application, initiate an ongoing dialogue between inpatient and outpatient teams (e.g., electronic dialogue facilitated by PEPL's group email messaging functionality or via secure, HIPAA compliant, web-based and mobile messaging applications hosted by a Partners approved business associate, CareThread, inc), and facilitate collaborative creation of a discharge plan and scheduling of follow-up appointments and tests within an appropriate time frame. In addition, the discharge advocate will create a calendar with all follow-up appointments, contribute to the inpatient team's patient instructions, and coordinate all patient education activities prior to discharge. As part of these activities, the Discharge Advocate will ask patients and caregivers their most important goals for the post-discharge period, document them, and take steps to maximize achievement of these goals. The ROC will telephone conference or video conference using a HIPAA compliant application provided by CareThread, inc., or comparable modality (i.e. Facetime) with the inpatient attending in the presence of the patient prior to discharge, address any patient concerns about the post-discharge plan, and encourage the patient to attend all follow-up appointments in the PCMH.
3. Visiting nurse (VNA) appointments. Partners Healthcare at Home will provide VNA services to qualifying patients in the week after discharge (i.e., those who are at least temporarily homebound). Unlike routine VNA visits, these will include a structured template to ensure that patients are fully evaluated for their ability to manage their conditions at home. Visiting nurses will have the contact information of the inpatient and PCMH teams and will be encouraged to contact either with questions. They will write structured notes within the ambulatory EMR used by all PCMH practices.
4. A multi-disciplinary post-discharge PCMH clinic visit within 72 hours of discharge. Working as a team, the ROC, PCP, PCMH pharmacist, and other personnel as needed (e.g., social worker) will see all patients within 3 days of discharge. Following a standardized algorithm, each team member will play a role to evaluate the patient's progress along the plan of care, ensure patient safety, and optimize post-discharge outcomes. The ROC will initiate "coaching," based on the Care Transitions Intervention coaching model, so that the patient can manage their conditions at home and effectively

interact with the health care system. The ROC will also conduct 3 additional coaching interventions by phone.

5. High-risk patients will receive additional interventions as needed:
   a. A home visit by the ROC to better evaluate the patient's home environment and focus coaching on skills required by patients in their homes.
   b. Enrollment in the Partners integrated Care Management Program (iCMP), which includes intensive and individualized case management.
   c. Enrollment in telemedicine programs, for example, daily monitoring of weights and diuretic dose adjustment for patients with chronic heart failure.
   d. A visiting pharmacist from Dovetail Health, Inc. (an outside company hired by Partners Healthcare), may also see the patient at home to perform medication reconciliation, screen for non-adherence and side-effects, and provide counseling to address any medication problems. The visiting pharmacist would then share a summary of the home visit with the patient's primary care physician.
6. Novel health information technology
   a. A web-based discharge ordering module will help ensure the quality of discharge documentation by auto-importing certain information and by requiring completion of structured data fields.
   b. A novel automated notification system will email inpatient attendings and PCPs of the results of tests pending at discharge as they become available.[27]
   c. As noted above, group email capability to all inpatient and ambulatory care team members, facilitated by the PEPL application, will improve multi-disciplinary communication.
   d. A secure, novel, Partners approved web-based and mobile messaging applications to support patient-centered, multidisciplinary communication.

Table 1 below summarizes each of the components of the intervention and how they relate to each of the domains of the Ideal Transition in Care conceptual model.

Table 1. Components of the Collaborative Transitions Intervention

Ideal Transition in Care Domain	**Intervention Components**
Complete Communication of Information	Web-based discharge ordering module: auto-imported information and required structured fields Discharge Advocate can contribute to the discharge documentation as needed
Availability, Timeliness, Clarity, and Organization of Information	Web-based discharge ordering module: documentation must be completed prior to discharge (BWH only); documentation is available in the Partners EMR and emailed to all providers; structured information is incorporated into easy-to-read documents Automated notification of results of tests pending at discharge emailed to inpatient attendings and primary care providers
Medication Safety	Inpatient pharmacist takes in-depth preadmission medication history, reconciles medications at discharge, edits patient instructions regarding discharge medications, and counsels patient at discharge, especially regarding changes in medications, reasons for changes, and potential side effects to watch for Outpatient pharmacist sees patient at post-discharge clinic visit,

	confirms access to and understanding of discharge medication regimen, screens for non-adherence and side effects, and provides counseling to address any potential medication problems. A visiting pharmacist, from Dovetail Health, Inc. (an outside company hired by Partners Healthcare), may also see the patient at home to perform the tasks above and share a summary of the home visit with the patient's primary care physician.
Educating Patients, Promoting Self-management	Discharge Advocate provides focused education at discharge to patient and any relevant caregivers: major diagnoses, dates of follow-up appointments, self-care instructions, and whom to contact for any problems Discharge Advocate uses teach-back to confirm understanding At post-discharge clinic, responsible outpatient clinician (ROC) continues teaching, reinforces information presented at discharge, and initiates coaching similar to the Care Transitions Program: how to keep a personal health record, medication self-management, danger signs to watch for and how to respond, and timely follow-up ROC makes 3 additional calls over 1 month to continue coaching For high-risk patients, ROC makes one home visit soon after discharge
Monitoring and Managing Symptoms after Discharge	For eligible patients, visiting nurse performs a structured assessment for patients' ability to care for themselves at home and manage their conditions Documentation provides contact information for patient to call if any problems, with 24/7 inpatient attending (or surrogate) and PCP availability by pager Additional disease-specific monitoring provided as needed, for example, use of an existing heart failure telemonitoring service
Enlisting Help of Social and Community Supports	Discharge Advocate works with inpatient care coordinator and ROC to arrange for appropriate home services prior to discharge Discharge Advocate enlists help of caregivers, identifies and enlists help of community supports (e.g., elder services organizations, religious and community service agencies)
Advanced Care Planning	Automatic trigger tool in the hospital for patients with terminal conditions, which leads to palliative care consultation
Coordinating Care Among Team Members	All members of the care team have read- and write-access to a single medical record where all documentation will be stored Discharge Advocate enters all inpatient and outpatient providers into the Partners Enterprise Patient List (PEPL) application, facilitating group email communication Telephone conference or video conference among inpatient attending, patient, and ROC prior to discharge Web-based and mobile 'microblog' messaging application
Discharge Planning	Discharge Advocate facilitates communication between inpatient

	and outpatient providers regarding discharge plan of care • Timely follow-up appointments (including post-discharge clinic visit) scheduled prior to discharge, taking patient's and caregiver's schedule into account

Additional Intervention: Soliciting Patient's Goals and Priorities

In addition to the above interventions, we will provide an additional intervention in a 2x2 factorial design (i.e., half the usual care patients will receive it and half the patients receiving the other interventions described above will also receive it). The goal of this intervention to ask patients about their overall goals for the recovery period, their priorities in terms of health concerns, outcomes, and treatments. This information will then be shared with the members of the care team (see attached patient survey form and email script with providers). Patients will be informed that their answers will be shared with the medical team.

For those patients not receiving the intervention, their opinions will still be solicited but the information will not be shared with providers. This is done to determine concordance between the patients' priorities and the plan of care in both arms of this sub-study. It also fairly evaluates the impact of simply being asked about these priorities.

Qualitative Sub-Study of Patients with Type II Diabetes:

To learn more about the factors that lead to hospitalization in patients with type 2 diabetes, and how they might be prevented in the future, Cherlie Magny-Normilus, the Nurse Practitioner Discharge Advocate on the study at BWH will conduct a brief qualitative study of approximately three patients from the usual care arm. After patients have provided informed written to participate in the main study, Cherlie will approach randomly selected patients from the usual care arm and ask their consent to participate in a 30-60 minute confidential interview (see attached brief consent form). The interview will focus on the reasons why the patient was admitted to the hospital, any behavioral or self-care issues related to their diabetes that might have contributed to the hospitalization, and whether and how any of these issues have been addressed (see attached semi-structured interview guide). Interviews will be recorded and transcribed, and standard qualitative research techniques will be used to derive themes from these interviews. All data will be kept confidential, and patient's identities will never be used. If quotes from individual patients are to be used in any report or manuscript, we will receive prior permission to do so.

Primary outcome: Adverse events within 30 days of discharge. We chose this as the primary outcome for several reasons:

- Safety is a prerequisite for all other components of quality of care.
- Patients have a right to expect that the transitions process will be as safe as possible.
- Adverse events, i.e., injuries due to medical care rather than the disease process, are by definition unpleasant to patients, involving unpleasant symptoms, loss of function, and/or additional medical care.
- Our patient/caregiver representative confirmed that this is a reasonable primary outcome.
- Adverse events are relatively sensitive to change.

Secondary outcomes:

1. Functional Status. During the inpatient enrollment period, patients will complete a modified Medical Outcomes Survey Short Form-12 (SF12) regarding functional status and health-related quality of life 1 month prior to admission. Thirty days after discharge, SF12 questions will be repeated so that functional status can be compared

to prior to admission. This methodology was effectively employed as part of the Multi-center Hospitalist Study. In the hospital, we will add questions regarding the patient/caregiver's most important goals for post-discharge recovery; during follow-up, we will ask the extent to which the patient achieved those goals.

2. Patient engagement and Opinions of the Discharge Process. Also during the follow-up phone call, we will ask patients about their participation in, understanding of, and ability to carry out the post-discharge plan. These questions will include the Care Transitions Measure 3 (CTM-3) questions, questions from the Interpersonal Processes of Care survey, and several additional questions from the HOMERUN study of readmitted patients.
3. Post-Discharge Health Care Utilization. We will measure ED visits and hospital readmissions within 30 days of discharge using a combination of administrative data for all Partners Hospitals plus patient report for all utilization outside the Partners system. Previously studies have shown that this is effective in capturing almost all admissions for patients discharged from BWH, and we have no reason to expect otherwise for MGH.
4. Provider satisfaction with care team communication/collaboration. We will measure inpatient and ambulatory provider experience and satisfaction with care team communication approximately 48-72 hrs post-discharge using a survey instrument.

See **Table 2** below for a description of all outcomes and how they will be collected.

Table 2. Study Outcomes

Outcome	Timing	Data Sources	Time Required	Data Collection Process	Form of Analytic Variable
Primary Outcome					
Post-Discharge Adverse Events	Continuously during the preadmission and intervention periods. Eligibility begins for any practice once they become a PCMH	Patient interview 30 days after discharge followed by physician adjudication (900 patients each admitted to BWH and MGH over 18 months)	15 minutes per interview; 30 minutes for each physician in teams of two (1800 total physician-hours)	Standard patient interview form administered by phone; standard adjudication form completed using interview responses and medical records	Patients with at least one post-discharge adverse event; same for preventable adverse events; duration of ameliorable adverse events
Secondary Outcomes					
Functional Status 30 days after discharge compared with prior to admission	Survey administered in the hospital and 30 days after discharge	Modified SF12 survey regarding health status one month prior to admission and again one month after discharge (during the previous week)	5 minutes per survey	Inpatient surveys administered in person by a research assistant; post-discharge survey administered by phone by a research assistant	Total SF12 score post-discharge minus total SF12 score pre-admission; mental and physical component sub-scores

Patient engagement and opinions of the discharge process	Survey administered 30 days after discharge	CTM-3 questionnaire; Survey regarding participation in, understanding of, and ability to carry out care plan	5 minutes per survey	Post-discharge survey administered by phone by a research assistant	CTM-3 score; proportion of patients who positively respond to each question
Health Care Utilization	As with the primary outcome	Administrative data for all utilization within Partners; patient interview 30 days after discharge for other utilization	5 minutes per survey	Post-discharge survey administered by phone by a research assistant	Patients with at least one ED visit or hospital readmission within 30 days; readmissions only
Provider satisfaction with care team communication/collaboration	Provider survey administered approximately 48-72 hrs after patient discharge	Provider survey regarding experience identifying care team and using various communication modalities	3 minutes per survey	Web-based survey administered to providers via RedCap	Proportion of patients whose providers favorably respond to each question

Mixed Methods:

One limitation of much systems improvement research is insufficient attention to the extent and reasons for implementation success and failure. Thus, when outcomes are not improved, it is difficult to know whether it is due to lack of efficacy of the intervention or failure of implementation. Furthermore, opportunities to learn how to best implement an intervention are lost. To address these deficiencies, we plan to accompany our quantitative evaluation of outcomes with mixed methods program evaluation, similar to that being conducted for the MARQUIS medication reconciliation study, an AHRQ-funded 6-site study led by Dr. Schnipper.

Intervention Fidelity

We will use a scoring system to measure the extent to which each patient receives each component of the ideal transition, regardless of study arm (0-4 points for each component). It is based on tools being used for the MARQUIS study and also on a 14-site study of discharge processes being conducted by the Hospital Medicine Re-engineering Network (HOMERUN; BWH is a participating site in the study, and Dr. Schnipper is leading investigator on the study). The score will be completed by a trained research assistant at each hospital blinded to study arm, as is currently done for HOMERUN.

Evaluation of Readmitted Patients

Based on previous studies and on a tool already developed by HOMERUN (Hospital Medicine Reengineering Network), we will identify study patients currently hospitalized with a readmission. A trained research assistant (RA) will interview the patient and family to identify possible reasons for the readmission, including possible problems with the transitions process and the patient's readiness to manage the post-discharge care plan. The RA will also email a survey to the teams that cared for the patient during the original admission and the readmission and the patient's PCP regarding possible deficiencies with the transitions process. Teams of two physician adjudicators will then review this information, the medical record, and the scoring system of the transition process from the index admission, and complete an instrument to determine the preventability of the

readmission (including contributing factors), which if any deficiencies in the transitions process contributed to the readmission, and possible interventions that might have prevented them. This information will be fed back to the inpatient and outpatient intervention teams and will allow for iterative refinement of the intervention.

Measures of Environmental Context

We will measure the context in which the intervention was implemented in order to identify possible barriers to and facilitators of implementation. These factors will first be measured quantitatively using previously validated surveys. For example, safety and teamwork culture on each unit of each hospital and at each PCMH practice will be measured using portions of the AHRQ Hospital Survey on Patient Safety. We have had success administering these surveys to front line clinicians as part of the MARQUIS study.

Another contributor to implementation success is how satisfied users are with the intervention. During the pre-implementation period and after starting the intervention (after a 3 month "burn in" period), we will ask approximately 300 inpatient and outpatient providers to complete a short survey measuring their global satisfaction with the transitions process. Respondents will include inpatient attendings, residents, physician assistants, pharmacists, nurses, care coordinators, and therapists; and outpatient PCPs, nurses, pharmacists, care coordinators, and social workers in each PCMH. Post-implementation, based on other surveys developed by these investigators, we will also ask questions regarding clinicians' opinions of the intervention, its effects on their workflow and on the perceived quality of transitions in care, communication, teamwork, and patient outcomes.

Qualitative Information

Focus groups will be facilitated by a co-investigator (Anuj Dalal) and qualitative researcher (Elyse Park) during the post-intervention time period, using a similar design to those being used for MARQUIS. We will use a stratified random sampling design by role to ensure fair and broad representation. Focus groups will be conducted with 6-8 individuals for each clinician type (inpatient and outpatient physicians, nurses, pharmacists, and care coordinators, approximately 65 participants in total). We will use a semi-structured focus group guide to standardize data collection across all groups. Domains will include:

- Description, expectations, and engagement with the transitions process as currently designed
- Perceptions of the intervention's effects on workflow and on patient care
- Aspects of the intervention felt to be most and least beneficial and explanations as to why
- Difficulties implementing the intervention
- Co-interventions
- Recommendations for improvements
- Each focus group session will last approximately 60 minutes. They will be audio-recorded and transcribed. Themes will be identified with data coding (see qualitative analysis plan).

Once the program evaluation is completed, we will combine our survey and interview results to answer questions about implementation success and failure. For example, where outcomes do not improve, is it because of poor intervention fidelity? If the problem is one of low intervention fidelity, what were the contributing causes (e.g., poor patient safety culture on that unit, low engagement with the tool, perception that the intervention does not improve patient care)? Conversely, where the intervention was successful, can we determine what factors led to success?

Two patient focus groups will be facilitated by Maureen Fagan, Director of the BWH Center for Patients and Families during the post-intervention time period, using a similar design to those being used for the MARQUIS study conducted by these same investigators. Patients

will be contacted to volunteer to participate if they recently received the intervention arm of the study and if they are greater than thirty-day post-discharge. Focus groups will be conducted with 6-8 patients, one facilitator, and three Patient Family Advisory Council members. We will use a semi-structured focus group guide to standardize data collection across both groups (seeattached). Domains will include:

- Intervention components received
- Perceptions of the intervention's effects on patient care
- Aspects of the intervention felt to be most and least helpful and explanations as to why
- Recommendations for improvements

Each focus group session will last approximately 90 minutes. They will be audio-recorded and transcribed. Themes will be identified with data coding (see qualitative analysis plan). Results will then be fed back to intervention team, co-investigators, and steering committee so that possible changes to the intervention can be made. The purpose of these focus groups is to refine the intervention so that it is more patient- and caregiver-centered.

Analysis:

All study patients will receive the intervention (except those involved exclusively during Part 2, pilot data collection).

General

To rigorously analyze the effects of the intervention while adjusting for temporal trends and PCMH-specific differences and baseline performance, we will use the stepped wedge methodology and a random effects analysis on 1800 patients across the two sites. The analysis will also control for pertinent patient characteristics that may vary over time or across sites.

The patient will serve as the unit-of-analysis and the primary outcome will be the presence of any post-discharge adverse events. A logistic regression model will be used to analyze this outcome, to compare the rate of total adverse events between the pre-intervention and the intervention period. The independent predictors in the model will be month (to adjust for temporal trends) and intervention arm. The GLIMMIX procedure in the SAS 9.3 statistical package (Cary, NC) will be used to carry out the analysis since it is capable of capturing multi-level random effects. Random effects will be included to account for clustering at the level of the hospital nursing unit and PCMH practice (due to common patient populations, practice styles or institutional culture), discharging provider and PCP (due to individual practice styles). We will not need to include random effects in the model for clustering at the level of the patient, as random selection of patients for the study will exclude duplicate patients.

In addition to the primary predictors outlined above, our analysis model will also include patient characteristics that may confound the intervention effects. Potential confounders will include characteristics previously demonstrated to be associated with post-discharge adverse events or hospital readmissions. Variables from administrative data sources will include patient age and sex, admission service, acute diagnoses and procedures performed during the hospitalization, acuity of the admission (i.e., non-elective), hospital length of stay, discharge sodium and hemoglobin, Elixhauser comorbidity score, number of elective and urgent admissions in the previous year, and number of ED visits in the previous 6 months. To improve the model, we will also adjust for several other variables, known to be important in determining post-discharge outcomes, asked during the intake patient questionnaire, including functional status (using the SF12 as noted above), depression (using the Center for Epidemiologic Studies Depression Scale 10-item version (CES-D10)), health literacy (using the s-TOFHLA), cognitive impairment (using the mini-cog), primary language, and degree of social supports (using the ENRICHD Social Support Inventory; intake survey).

Other process and secondary outcome measures will be analyzed in a similar way. Presence of at least one preventable adverse event will be analyzed in the same manner as total adverse events. Duration of ameliorable adverse events will be analyzed similarly but using a gamma distribution in GLIMMIX (appropriate for survival data). Change in functional status (SF12 total score, physical and mental component scores) from prior to admission to 30 days post-discharge will be analyzed by linear regression using the MIXED procedure. Individual questions from the patient opinion surveys will be presented as dichotomous outcomes (agree versus disagree), and analyzed using logistic regression models. ED or readmission within 30 days (and readmission alone) will be analyzed as a dichotomous outcome using logistic regression.

Subgroup Analyses

One of the goals of this research is to determine if there are any patient subgroups that preferentially benefit from this type of intervention. Therefore we will conduct several subgroup analyses and use interaction terms (i.e., subgroup*intervention) to determine effect modification. A priori chosen subgroups will include:

- Elderly (over age 65 years)
- Patients with inadequate or marginal health literacy using the s-TOFHLA score
- Patients with multiple chronic conditions based on Elixhauser comorbidity scores
- Patients at high risk for potentially avoidable readmissions using the HOSPITAL score

On-treatment Analysis

As described above, we will perform a secondary analysis in which receipt of each component of the ideal transition in care is introduced into the model, along with all the covariates noted above, to estimate the adjusted effects of variable adherence with the intervention on outcomes, measure intervention fidelity, help determine the most important components of the intervention, and identify contamination and co-interventions.

Program Evaluation

The number and types of components of the ideal transition received by each patient in both arms of the study will be analyzed descriptively. In the intervention arm, this will serve as a proxy for intervention fidelity, i.e., the extent to which the intervention is implemented as intended. Analysis of safety culture and teamwork will be reported descriptively: as mean composite scores with standard deviations or medians with interquartile ranges as appropriate. Individual questions from the clinician satisfaction surveys (with the transitions process in general and with the intervention) will be presented descriptively.

Qualitative Analysis

Elyse Park, an experienced qualitative researcher at MGH who has worked with Dr. Schnipper on previous projects, will lead the qualitative content analysis of the focus group data, coding and analyzing data by themes. The transcribed data will be uploaded into NVivo 10 (QSR, Melbourne, 2012), a computer-assisted qualitative data analysis application. Two coders (Dr. Dalal and Dr. Crevensten) will independently code data into discrete categories based on “grounded theory,” an inductive approach in which the categories used for analysis are derived from the data. Analysis will be conducted across groups of clinicians (e.g. attending physicians, nurses) and sites (BWH and MGH, e.g., in determining barriers to and facilitators of implementation). The 2 coders will meet with Dr. Park at each stage of the coding process. Discrepancies in themes and codes will be resolved through discussions of interpretations and comparisons to raw data. Coding will continue until coder reliability (kappa>0.80) is achieved. Dr. Park will review themes and emerging findings during regularly scheduled analysis discussions with Dr. Schnipper and other investigators. This iterative, analytic and reflective process will be ongoing as transcripts become available, thus allowing us to modify the coding scheme as well as assure that thematic saturation (the point at which no new data emerge) is reached.

Mixed Methods: Linking Context, Fidelity, and Intervention to Outcomes

Although there are only 2 participating hospitals, there are a number of different user types (attending physicians, PCPs, residents, PAs, inpatient and outpatient nurses and pharmacists), approximately 30 different inpatient nursing units and approximately 18 PCMH clinics where the intervention will be implemented. We can use mixed methods to look at differences among sites and user types and develop hypotheses regarding possible reasons for our findings. For example, if specific facets of the intervention are consistently associated with improved patient outcomes and are implemented with high fidelity, then it is likely that those interventions are effective features of an ideal transition. On the other hand, if outcomes improve on one unit but not others, or in one PCMH practice but not others, then we should be able to determine whether the lack of success was due to low intervention fidelity or ineffective features of the intervention; the reasons for these findings can be further explored (e.g., contextual differences in safety culture and team climate). These could be derived from both quantitative measures such as the team climate survey and from focus groups with representative users. A combination of qualitative and quantitative data will also be useful for exploring how user satisfaction, perceived effects on workflow, and perceived effects on patient care correlate with intervention fidelity.

Timeline:

- ❒ Part 2, Pilot Data Collection: Sept 2012 – Jun 2013
- ❒ Intervention development: Jan-June 2013
- ❒ Pilot testing: Jul 2013
- ❒ Patient enrolment: Aug 2013 – Dec 2014
- ❒ Follow-up and adjudication: Sept 2013 – Jan 2015
- ❒ Data Analysis and manuscript preparation: Dec 2014 – Nov 2015

For studies involving treatment or diagnosis, provide information about standard of care at Partners (e.g., BWH, MGH) and indicate how the study procedures differ from standard care. Provide information on available alternative treatments, procedures, or methods of diagnosis.

Once primary care practices become a PCMH, they will likely take several steps on their own to improve transitional care. Therefore, the relevant question is whether patient outcomes can be improved over this "usual care" by providing sites with a standard set of intervention components, informed by the medical literature and a conceptual model of the ideal transition in care, which leverages their new capabilities and which are combined with interventions on the hospital side designed to facilitate coordinated, patient-centered care. This choice of comparator therefore mimics as closely as possible the choices faced by any practice that has become a PCMH and which works within an ACO or other similarly arranged integrated delivery system.

During the study, we will use a scoring system to measure the extent to which all patients receive each of the components of an ideal discharge, regardless of study arm. This will allow us to look at differential adherence between the comparators and its impact on patient outcomes.

Describe how risks to subjects are minimized, for example, by using procedures which are consistent with sound research design and which do not unnecessarily expose subjects to risk or by using procedures already being performed on the subject for diagnostic or treatment purposes.

Participation in this project will not interfere with usual care during or after the patients' hospitalization in any way. There is a theoretical risk that PHI could become known to unauthorized persons, but we will take all steps necessary to protect PHI (see below). Throughout the study we will use procedures consistent with sound research design and which do not expose subjects to unnecessary risk. Patients can withdraw from the study at any time. Data monitoring will be conducted quarterly (see below).

Describe explicitly the methods for ensuring the safety of subjects. Provide objective criteria for removing a subject from the study, for example, objective criteria for worsening disease/lack of improvement and/or unacceptable adverse events. The inclusion of objective drop criteria is especially important in studies designed with placebo control groups.

This is a minimal risk study. Patients will receive access to a number of services designed to improve their care after discharge. We will monitor study results quarterly to ensure that adverse events (e.g., hospital readmission) are not occurring more commonly in the intervention group than comparable patients from other practices (an unlikely event given that our increased monitoring should make both these outcomes less common in the study subjects – see Data Safety and Monitoring below). Given the minimal risk to patients, our data safety and monitoring procedures, the relatively small sample size, and the need to enroll 1800 patients to ensure our ability to evaluate outcomes, we do not plan on having drop criteria.

FORESEEABLE RISKS AND DISCOMFORTS

Provide a brief description of any foreseeable risks and discomforts to subjects. Include those related to drugs/devices/procedures being studied and/or administered/performed solely for research purposes. In addition, include psychosocial risks, and risks related to privacy and confidentiality. When applicable, describe risks to a developing fetus or nursing infant.

There is a theoretical risk that PHI could become known to unauthorized persons, but we will take steps to minimize this risk (see below).

Patients may find it inconvenient to receive all the planned services after discharge, but they can refuse to participate in any component of the intervention or withdraw from the study at any time.

EXPECTED BENEFITS

Describe both the expected benefits to individual subjects participating in the research and the importance of the knowledge that may reasonably be expected to result from the study. Provide a brief, realistic summary of potential benefits to subjects, for example, "It is hoped that the treatment will result in a partial reduction in tumor size in at least 25% of the enrolled subjects." Indicate how the results of the study will benefit future patients with the disease/condition being studied and/or society, e.g., through increased knowledge of human physiology or behavior, improved safety, or technological advances.

Patients might benefit in terms of better self-management of their illnesses or diseases, better monitoring of their medical conditions, and fewer hospital readmissions. For example, we estimate that patients will have a decrease in their post-discharge adverse event rate from 30% to 23.3%. If this intervention is successful, then the results of this study and future studies would be published and may influence other hospitals, quality improvement

organizations, and possibly regulatory agencies. The long-term results would be improved care (and possibly reduced costs) of patients in the immediate post-discharge period.

EQUITABLE SELECTION OF SUBJECTS

The risks and benefits of the research must be fairly distributed among the populations that stand to benefit from it. No group of persons, for example, men, women, pregnant women, children, and minorities, should be categorically excluded from the research without a good scientific or ethical reason to do so. Please provide the basis for concluding that the study population is representative of the population that stands to potentially benefit from this research.

Women and minorities are fully represented in the eligibility criteria. Our goal is to enroll patients whose characteristics are representative of the entire population of eligible patients. In that way, the study population will be representative of the population that stands to potentially benefit from this research.

Children will not be eligible for this study for several reasons:

1. These interventions are focused on patients who generally care for themselves.
2. BWH does not care for children. The costs of expanding this study to include a pediatric hospital would be prohibitive.

In the future, we advocate that similar studies be conducted with pediatric patients.

When people who do not speak English are excluded from participation in the research, provide the scientific rationale for doing so. Individuals who do not speak English should not be denied participation in research simply because it is inconvenient to translate the consent form in different languages and to have an interpreter present.

Spanish-speaking individuals will be included in the study, and we will provide bilingual services as part of the intervention in order to accommodate them. For this current study, we cannot enroll patients who speak neither English nor Spanish because of the lack of a complete set of services at BWH that would accommodate them. In future studies and interventions, we will strive for a complete set of services that accommodate all patients regardless of language. We recently completed the Pharmacist Intervention for Low Literacy in Cardiovascular Disease (PILL-CVD) study and feel confident that we can provide a full range of discharge services to Spanish-speaking patients, as was done in that study.

For guidance, refer to the following Partners policy:

Obtaining and Documenting Informed Consent of Subjects who do not Speak English
http://healthcare.partners.org/phsirb/nonengco.htm

RECRUITMENT PROCEDURES

Explain in detail the specific methodology that will be used to recruit subjects. Specifically address how, when, where and by whom subjects will be identified and approached about participation. Include any specific recruitment methods used to enhance recruitment of women and minorities.

Patient recruitment will be performed by a trained research assistant or medical student prior to the patient's discharge. Eligible subjects will be identified each morning using the BICS computer system at BWH and PCIS at MGH. Only the "minimum necessary" amount of

information will be gathered prior to patient consent in order to confirm patient eligibility. Before being approached by the research assistant or medical student, patients will be asked by a member of the medical team (i.e. primary nurse or resident) if it is acceptable for him to talk to the patient about the study. We feel that the nurse is an appropriate person to include in the process because he/she will be familiar with the patient's medical history and knows best if the patient is cognitively and physically able to give informed consent for participation in the study at that time. Patients and/or their proxies will then be approached by the research assistant or medical student and asked to participate in the study (see consent procedures, below). If a patient for whom a proxy provided initial consent regains capacity at the post discharge clinic, the study Discharge Advocate will review the consent form with the patient and will ask for the patient's written consent. If patients refused to provide consent at that time, then they will be withdrawn from the study. After informed consent is obtained, we will randomize the order in which eligible patients will be approached in order to avoid any bias in enrollment. We do not plan to use special methods to ensure sufficient enrollment of women and minorities, but if an interim analysis reveals that they are under-represented compared with expected for this patient population, we will over-sample women and minorities as needed.

Provide details of remuneration, when applicable. Even when subjects may derive medical benefit from participation, it is often the case that extra hospital visits, meals at the hospital, parking fees or other inconveniences will result in additional out-of-pocket expenses related to study participation. Investigators may wish to consider providing reimbursement for such expenses when funding is available

Remuneration will not be provided to subjects. We expect their out-of-pocket costs related to the intervention to be small.

For guidance, refer to the following Partners policies:

Recruitment of Research Subjects
http://healthcare.partners.org/phsirb/recruit.htm

Guidelines for Advertisements for Recruiting Subjects
http://healthcare.partners.org/phsirb/advert.htm

Remuneration for Research Subjects
http://healthcare.partners.org/phsirb/remun.htm

CONSENT PROCEDURES

Explain in detail how, when, where, and by whom consent is obtained, and the timing of consent (i.e., how long subjects will be given to consider participation). For most studies involving more than minimal risk and all studies involving investigational drugs/devices, a licensed physician investigator must obtain informed consent. When subjects are to be enrolled from among the investigators' own patients, describe how the potential for coercion will be avoided.

Inpatients at BWH and MGH will be asked by a research assistant (RA) or medical student, on the day of admission (in their hospital rooms), to provide written informed consent and authorization to access limited protected health information. The RA or medical student will

first identify potential subjects on their day of admission by scanning computer-based and paper records for patients admitted to BWH/MGH and with a PCP from a participating PCHI PCMH practice. These records include the computerized sign-outs used by all medical residents, which contains principal diagnosis, medications, and the assessment and plan. The RA or medical student will perform a focused review of the hospital chart to verify other inclusion criteria and the absence of exclusion criteria. Details that cannot be verified from the chart, such as the presence of a caregiver who administers the patient's medications if the patient does not administer them him/herself, will be assessed directly with the patient through a short screening interview.

Patients will generally enroll at the time they are approached, but if patients need more time to consider participation, the RA or medical student will return later that day or the following day. The RA or medical student may also need to postpone the consent process if proxy consent is needed (in which case arrangements will be made for a mutually agreeable time).

It is possible that some patients will be under the care of Dr. Schnipper, the PI, who attends on the general medicine service at BWH 10 weeks a year. In that case, the RA or medical student will take special care to tell the patient that their decision to enroll will have no affect whatsoever on Dr. Schnipper's care (and whenever possible, Dr. Schnipper will not be aware of which patients have been approached or enrolled in the study).

This is a minimal risk study, so it is not required that the RA or medical student be a licensed physician.

In addition, we will ask a representative sample of clinicians from the participating inpatient units and outpatient practices to participate in surveys and focus groups in order to learn about environmental context, provider satisfaction, and other barriers and facilitators of successful implementation. We will explain the study to these clinicians, explain that participation is voluntary (and can end at any time), that their decision to participate will not be known by their supervisors or other hospital staff outside the study, and that results will be presented in aggregate, give them an opportunity to opt out of the study, and explain that they can refuse to answer any question they don't want to answer. After that, consent will be implied by their participation in the data collection activity. Please see the attached sample email explaining the study to inpatient attendings.

NOTE: When subjects are unable to give consent due to age (minors) or impaired decision-making capacity, complete the forms for Research Involving Children as Subjects of Research and/or Research Involving Individuals with Impaired Decision-making Capacity, available on the New Submissions page on the PHRC website:
http://healthcare.partners.org/phsirb/newapp.htm#Newapp

For guidance, refer to the following Partners policy:
Informed Consent of Research Subjects
http://healthcare.partners.org/phsirb/infcons.htm

DATA AND SAFETY MONITORING

Describe the plan for monitoring the data to ensure the safety of subjects. The plan should include a brief description of (1) the safety and/or efficacy data that will be reviewed; (2) the planned frequency of review; and (3) who will be responsible for this review and for determining whether the research should be altered or stopped. Include a brief description of any stopping rules for the study, when appropriate. Depending upon the risk, size and complexity of the study, the investigator, an expert group, an independent Data and Safety Monitoring Board (DSMB) or others might be assigned primary responsibility for this monitoring activity.

NOTE: Regardless of data and safety monitoring plans by the sponsor or others, the principal investigator is ultimately responsible for protecting the rights, safety, and welfare of subjects under his/her care.

As noted, the PI and project manager will review emergency department visits, and hospital readmissions in the two arms of the study on a quarterly basis. Events among study subjects will be reviewed for possible attribution to the intervention. In the unlikely event that these events are more common than comparable patients in other practices (taking risk-adjustment into account) or directly attributable to the intervention, we will contact the PHS IRB and PCORI immediately and take further action as recommended. We did not plan strict stopping rules. Because potential risk to patients is minimal (i.e., this is an intervention focused on patient behavior and monitoring, without use of novel medications, devices, or procedures), we do not plan to employ a Data Safety Monitoring Board.

Describe the plan to be followed by the Principal Investigator/study staff for review of adverse events experienced by subjects under his/her care, and when applicable, for review of sponsor safety reports and DSMB reports. Describe the plan for reporting adverse events to the sponsor and the Partners' IRB and, when applicable, for submitting sponsor safety reports and DSMB reports to the Partners' IRBs. When the investigator is also the sponsor of the IND/IDE, include the plan for reporting of adverse events to the FDA and, when applicable, to investigators at other sites.

NOTE: In addition to the adverse event reporting requirements of the sponsor, the principal investigator must follow the Partners Human Research Committee guidelines for Adverse Event Reporting

The PI will report any adverse events associated with this project (e.g., based on patient complaints) annually to the Partners IRB as stated in the Adverse Event Reporting guidelines and also as described above under Data Safety/Monitoring.

MONITORING AND QUALITY ASSURANCE

Describe the plan to be followed by the principal investigator/study staff to monitor and assure the validity and integrity of the data and adherence to the IRB-approved protocol. Specify who will be responsible for monitoring, and the planned frequency of monitoring. For example, specify who will review the accuracy and completeness of case report form entries, source documents, and informed consent.

NOTE: Regardless of monitoring plans by the sponsor or others, the principal investigator is ultimately responsible for ensuring that the study is conducted at his/her investigative site in

accordance with the IRB-approved protocol, and applicable regulations and requirements of the IRB.

The PI and Project Managers at BWH and MGH will work together to ensure the validity and integrity of data collection and adherence to the IRB-approved protocol. The project managers will review all data collected from the study (from medical records or obtained by patient questionnaire) on a monthly basis, ensuring accuracy and completeness. They will also verify the presence of proper informed consent forms. The PI will personally train the RAs in methods of informed consent and data collection and personally observe the consent process and medical record abstraction process initially and quarterly.

For guidance, refer to the following Partners policies:

Data and Safety Monitoring Plans and Quality Assurance
http://healthcare.partners.org/phsirb/guidance.htm#13

Reporting Unanticipated Problems (including Adverse Events)
http://healthcare.partners.org/phsirb/guidance.htm#7

PRIVACY AND CONFIDENTIALITY

Describe methods used to protect the privacy of subjects and maintain confidentiality of data collected. This typically includes such practices as substituting codes for names and/or medical record numbers; removing face sheets or other identifiers from completed surveys/questionnaires; proper disposal of printed computer data; limited access to study data; use of password-protected computer databases; training for research staff on the importance of confidentiality of data, and storing research records in a secure location.

NOTE: Additional measures, such as obtaining a Certificate of Confidentiality, should be considered and are strongly encouraged when the research involves the collection of sensitive data, such as sexual, criminal or illegal behaviors.

All information from individuals or entities in the course of these studies that identifies an individual or entity will be treated as confidential in accordance with section 903c of the Public Health Service Act (42 U.S.C.299a-1). This will be done by keeping all personal identifiers in a separate location from the data, and only the research project managers, RAs, and study investigators will have access to the linked data. All machine-readable files will be stored on-line with appropriate security measures (e.g., in a password-protected database), and patients' identifiers and other data collected on paper will be kept in locked filing cabinets. Data collection instruments used during the project and stored on laptop or desktop computers will also be password protected. Printed computer data with PHI will be shredded and disposed of upon completion of the study and any record-keeping requirements. All research staff will be properly trained in the importance of confidentiality of data. The PI will be responsible for the confidentiality and security of all study databases.

These measures should be effective in preventing breaches of confidentiality.

SENDING SPECIMENS/DATA TO RESEARCH COLLABORATORS OUTSIDE PARTNERS

Specimens or data collected by Partners investigators will be sent to research collaborators outside Partners, indicate to whom specimens/data will be sent, what information will be sent,

and whether the specimens/data will contain identifiers that could be used by the outside collaborators to link the specimens/data to individual subjects.

Not Applicable.

Specifically address whether specimens/data will be stored at collaborating sites outside Partners for future use not described in the protocol. Include whether subjects can withdraw their specimens/data, and how they would do so. When appropriate, submit documentation of IRB approval from the recipient institution.

Not Applicable.

RECEIVING SPECIMENS/DATA FROM RESEARCH COLLABORATORS OUTSIDE PARTNERS

When specimens or data collected by research collaborators outside Partners will be sent to Partners investigators, indicate from where the specimens/data will be obtained and whether the specimens/data will contain identifiers that could be used by Partners investigators to link the specimens/data to individual subjects. When appropriate, submit documentation of IRB approval and a copy of the IRB-approved consent form from the institution where the specimens/data were collected.

Not Applicable.