PROTOCOL TITLE:

Behavioral Economics Applications to Geriatrics Leveraging EHRs

Short title: BEAGLE

PRINCIPAL INVESTIGATOR:

Stephen Persell, MD, MPH
Division of General Internal Medicine and Geriatrics
Phone: 312-503-6464

Email: spersell@nm.org

Version number: 7

VERSION DATE:

June 6, 2019

Clinicaltrials.gov Identifier: NCT03704389

1.0 Purpose of the Study:

The purpose of this study is to identify and describe clinicians' current clinical practices for ordering of 3 specific tests and treatments in older adults: (1) Ordering of prostate specific antigen (PSA) for prostate cancer screening in older adult men aged 70 years and older (2) Ordering of urinalysis and urine cultures to identify bacteriuria in older women aged 65 years and older and (3) testing and treatment of diabetes in all older adults aged 65 years and older.

Aim 1a: To develop and validate three electronic clinical quality measures of potential misuse related to the care of older adults, specifically (1) ordering of urine studies (e.g., urinalysis and urine culture) and antibiotic treatment for ASB in women ≥ 65 years old, (2) ordering of PSA for prostate cancer screening in men aged ≥ 76 years, and (3) failure to de-intensify anti-hyperglycemic treatment (e.g., insulin and/or oral hypoglycemic) in older adults with a HbA1c of < 7.0.

Aim 1b: To investigate patient and clinician factors associated with these same three clinical quality measures

Aim 1c: To investigate clinic-level variation and performance rates with these same three clinical quality measures across Northwestern Medicine clinics. These data will inform whether we see clinic-level variation similar to clinician-level variation we've identified in Aim 1b. Additionally, these data will help us determine if within the Northwestern enterprise what the power will be to determine significant differences in a clinical trial of interventions targeting these quality measures.

Aim 2: Interview clinicians to determine psychological drivers of treatment use and misuse. Using data from these interviews, design electronic health record (EHR)-delivered nudges to address these three clinical areas (testing for ASB, misuse of PSA, and over-intense treatment of diabetes (DM)

Aim 3: Pilot test the implementation of three decision support tools to reduce misuse in older adults within Northwestern Medicine's EHR to understand technical feasibility, work flow fit, preliminary impact on clinical outcomes and clinician acceptability.

2.0 Background / Literature Review / Rationale for the study:

2.1 By 2050, the United States population will consist of 88.5 million older adults aged ≥ 65 years, and adults aged ≥85 years are the fastest growing age group. Diagnostic approaches and treatments in older adults differ from younger adults, but few primary health care clinicians are educated to provide geriatric-focused healthcare. Diagnostic and therapeutic strategies misapplied to older adults lead to an increase in morbidity and mortality. Despite strong recommendations from the American Geriatrics Society for the Choosing Wisely Initiative, there are well-established examples for which clinicians do not often follow best practices in older adults leading to patient harm. These include: (1) testing and treatment for asymptomatic bacteriuria (ASB) in older women, (2) prostate specific antigen (PSA) testing in older men without prostate cancer, and (3) aggressive treatment with insulin or oral hypoglycemics for type 2 diabetes.

2.2 Clinicians may fail to incorporate best evidence into geriatric clinical for several reasons. First, they may ***underweight downstream harms*** of easily-ordered testing (e.g., a urinalysis for a non-genitourinary sign or symptom) or treatment (e.g., intensifying insulin to achieve tight control). Second, clinicians may ***overweight the risks of not preforming the action*** (e.g., missing cancer diagnosis, failing to diagnosis UTI in an older adult with non-specific symptoms). Third, clinicians may ***respond to real or perceived social norms*** (from patient and their families, other clinicians or

both) that set expectations to behave in specific ways. And fourth, clinicians may form ***habits*** that lead them to reproduce past behavior even if evidence has changed.

2.3 Clinical decision support nudges, informed by behavioral economics and social psychology and delivered via electronic health records (EHRs), are promising strategies to reduce the misuse of services.[8] Behavioral economics-informed interventions influence conscious and unconscious drivers of clinical decision making, are low cost to implement and disseminate, and can be incorporated into existing delivery systems. Our team has successfully employed these methods to the overuse of antibiotics for acute respiratory infections and has the necessary expertise in primary care practice, geriatrics, health informatics, social psychology, quality improvement, pragmatic trials and performance measurement to make this project a success. As our population continues to rapidly age, effective strategies to improve clinical care of older adults by reducing misused testing (e.g., urinalysis for ASB, prostate cancer screening with PSA) and treatment (e.g., overly-intense treatment of diabetes with insulin or other oral hypoglycemic) are critically needed.

3.0 Inclusion and exclusion criteria:

3.1 Aim 1 Clinical quality measures/ Electronic Health Record (EHR) Data Collection

1. For ASB measure: All adult women aged 65 years and older with a primary care, geriatrics or immediate care clinic visit at a Northwestern Medical Group (NMG) site from July 1, 2015 – July 14, 2019. All subjects over the age of 89 years will be aggregated into a single category.

2. For PSA measure: All adult men aged 76 years and older with a primary care or geriatrics clinic visit at a NMG site from July 1, 2015 – July 14, 2019. All subjects over the age of 89 years will be aggregated into a single category.

3. For DM measure: All adult aged 75 years and older with a primary care or geriatrics clinic visit at a NMG site from July 1, 2015 – July 14, 2019 with diagnosed diabetes. All subjects over the age of 89 years will be aggregated into a single category.

As of June 2019, we are extending the data look back period for these quality measures to allow us to look at what was happening across the enterprise during the grant period and specifically the pilot period for Aim 3 which was January 14-June 14, 2019. We are focused on the performance rate for each quality measure. We have selected this time period in order to determine baseline rates and study power using data that is close in time to the time-period of the indended subsequent clinic randomized trial.

Exclusion criteria: None

Study wide number of subjects: This is a descriptive study. Our intent is to apply clinical quality measure definition to all adult patients receiving care through NM clinics. We believe that there are < 200,000 patients ≥ 18 years old that may meet numerator or denominator criteria for one of the study measures.

3.2 Aim 2: Clinician interviews (qualitative)

1. Up to 60 (20 per study topic) Northwestern Medicine physicians who provide outpatient care at Northwestern Medical Group practice sites who have been practicing for NMHC for > 1 year
2. Ability to consent to study

Aim 2: Exclusion Criteria:

1. Clinicians managing only patients < 65 years old

3.3 Aim 3: Pilot Study
Inclusion criteria:

- Up to 15 Northwestern Medicine primary care internal medicine physicians who provide outpatient care at Northwestern Medical group practice sites
- Provide informed consent to participate

Exclusion criteria:

- Physician's panel is primarily patients < 65 years old

3.4. None of the following listed below will be included in the interview study:

1. Adults unable to consent
2. Individuals who are not yet adults (infants, children, teenagers)
3. Prisoners
4. Non-English speaking

Study timelines
We plan to work on aim 1 and aim 2 from November 2017 through 2019. We will work on aim 3 October 2018-August 2019.

4.0 Procedures Involved:

Aim 1: EHR data collection

4.1 Patient level characteristics will be collected retrospectively from the electronic data warehouse (EDW) for each eligible participant and include information on age, gender, medications, and comorbid conditions listed at the time of the visit using ICD-10 codes (see variable list). For a sample of cases, we will perform a manual physician chart review of Epic EHR documentation to examine the clinical circumstances that led to the performance of the clinical service (urine testing, PSA testing, or diabetes treatment with insulin or oral hypoglycemic drug).

4.2 A retrospective chart review is the most appropriate study design for this portion of the proposal because this will help us identify the variability of clinical tests ordered for older adults and help to identify frequent clinician misusers. This data pull will also provide variables for aim 1b which aims to understand characteristics of patients that receive these tests/treatments and the clinicians who order them.

4.3 Analysis of data from the EDW will occur on a secure Northwestern server.

Aim 2: Qualitative/Interview study

4.4 A member of the research team will contact a potentially eligible clinician by email using a Northwestern Medicine email account. The recruitment email script is attached within eIRB. We will follow-up with eligible clinician up to three times if we do not receive a response. If

the clinician is interested in participating, a member of the research team will schedule a time to meet with the participant for an interview, either in-person or by phone. In-person interviews will occur in the participant's office or in the office of a member of the research team, whichever is most convenient for the participant. The study team will ensure the interview (either by phone or in-person) is completed in a quiet, private location. Before the interview, the participants will be given detailed informed consent information via email. The research team will obtain permission to record the interview using an audio-device. A participant may decline consent to recording and remain in the study. The participant will be required to provide verbal consent to complete the interview and to record the interview. The verbal consent script that will be shared and reviewed with participants is attached within eIRB.

4.5 The content of the interview will include asking physicians how they would approach clinical scenarios that address the clinical topics of interest, ask them to explain the thought process behind their chosen actions, then ask them discrete questions asking them to indicate levels of agreement or disagreement with specific statements using Likert-type scales. The interview guides are attached within eIRB. Each interview will last 10-15 minutes. A qualitative study is the most appropriate study design for assessing knowledge, beliefs, and clinical decision making processes.

4.6 After 10-20 interviews for each topic, we will examine the responses and discuss with the multidisciplinary investigative team. If there are wide variations in responses and little consensus, we will survey additional physicians. If the surveyed physicians identify only one or a few candidate factors as having high importance, those will be selected for the intervention design.

4.7 After enrollment in this aim is completed, we will query the EDW for data related to consented providers' clinical business (e.g., number of annual patient visits and number of unique patients). Variables we intend to collect for this aim are included in separate variable list.

4.8 We anticipate that the qualitative study will take approximately 9 months with an estimated completion date prior to 12/1/2018.

4.9 Participants will only need to participate in the study for the duration of the interview. No follow-up data collection or interviews will be necessary.

Aim 3: Pilot Test

We'll recruit eligible physicians using the recruitment materials within eIRB+. We'll selectively recruit physicians that have an older patient panels (higher percentages of patients >= 65 years old). We'll identify eligible clinicians from an EDW query and obtain email addresses for eligible clinicians from NM Directory. See additional recruitment details below.

If possible, we'll email a copy of the written informed consent form ahead of scheduled meeting to discuss consent allowing participant more time to review and consider. Study enrollment visit will last less than 15 minutes and be at the location each clinician prefers. At scheduled study meetings, study staff will go over the informed consent form with potential clinician participants and obtain written consent from those who chose to participate. At this visit, study staff will share screenshots of what study clinical decision support alerts look like

as well as discuss workflows for the decision support. Consenting clinicians will be given a copy of signed informed consent document and additional card with contact details in the event they have questions or concerns about the study clinical decision support . We will confirm their Epic credentials and inform clinician of the anticipated date that we'll turn on the study decision support alerts .

The study follow-up period is 6 months. As mentioned above, each consenting clinician will be presented with the three study clinical decision support alerts when conditions are meet within a patient's chart based on decision support logic. Additional details are provided in supporting document about the clinical decision support logic.

Briefly, the three clinical decision support tools are:

(1) Clinical guidance when ordering prostate specific antigen (PSA) for prostate cancer screening in men aged 76 years and older
(2) Clinical guidance when ordering of urinalysis or urine culture to identify bacteriuria in women aged 65 years and older and
(3) Clinical guidance to prevent hypoglycemia in diabetes in all adults aged 75 years and older treated with insulin or an oral hypoglycemic whose hemoglobin A1c is below 7.0.

We will query the EDW approximately every 4 weeks during the follow-up period to collect data around when the study decision support alerts fire for consenting clinicians. At the end of the six month period, we'll send clinicians an online REDCAP link to complete a <10 minute survey about their experience with study clinical decision support and any suggestions they have for improvement. We have attached survey instrument within eIRB+ file. Clinicians will only receive survey items related to the clinical BPAs they received during the study period (e.g., if they never encounted the PSA BPA they will not be presented survey items related to PSA). Upon IRB approval, we plan to field the survey in June 2019 tied with the end of the six month study period.We may send survey reminders to clinicians up to three times if they fail to respond to initial survey invitation.

Participating clinicians will be given $100 cash at study enrollment visit and $150 cash at end of follow-up period. We will work to schedule convenient times to deliver study close out letter along with $150 cash for each clinician.

5.0 Multiple sites:

N/A

The study will only be conducted only at Northwestern University and Northwestern Medicine. Faculty collaborators at the University of Southern California, University of California Los Angeles, and RAND will not perform data collection or have access to identified participant data.

6.0 Incomplete Disclosure or Deception: N/A

7.0 Recruitment:

7.1 Aim 1: Not applicable. No recruitment for retrospective data analyses.
Aim 2: We will recruit physicians from Northwestern Medical Group (Central and North Regions). Eligible participants will receive an email about the study (attached within eIRB). If we do not

hear a response by email, we may call the potential participant's office to inquire about participation. We may follow up with a potential participant 3 times if no response to earlier attempts. If we hear a response from email, we will schedule a follow-up phone call to discuss details of participation.
Aim 3: Eligible clinicians will receive an email about the study (attached within eIRB). If we do not hear a response by email, we may call the potential participation's office to discuss participation. We may follow-up with a potential participant 3 times if no response to earlier attempts. If a clinician is interested, we'll email them a copy of informed consent document and arrange an in-person meeting.

8.0 Consent Process

Aim 1: Electronic Health Record (EHR) Data Collection portion of the study

8.1 We are requesting a waiver of HIPAA Authorization for the EHR data collection, as this a retrospective database study. Contacting and consenting all patients who previously underwent diagnostic testing is not feasible. Furthermore, the research questions of interest cannot be answered if the study were limited to consented patients only. No additional data will be collected from patients for this portion of the study. All data with identifying information will be destroyed at the earliest opportunity in a secure shredding box in a Northwestern University building, consistent with conduct of the research. Data sets containing coded identifiers linked to study ID numbers will be deleted from NU servers once data collection is completed. We have reviewed HRP-441 checklist-HIPPA waiver of authorization and believe our request meets all statements and requirements. We have provided the variables we will extract from EDW for this aim and have the identified variables in a separate list. Each variable requested is required to answer our research question and to ensure our clinical quality measures are defined most accurately. All identified information will be destroyed prior to the end of the research study. The use or disclosure of protected health information involves no more than minimal risk to the privacy of individuals. We have an adequate plan to protect the identifiers from improper use or disclosure. We have an adequate plan to destroy the identifiers at the earliest opportunity consistent with the conduct of our research. We will not share, reuse, or disclose the protected health information to any other non-study personnel person or entity, except as required by law, for authorized oversight of the research study. As described above, due to applying the quality measure definition to the entire patient population it would not be possible to practically conduct this aim without the wavier. This aim could not be conducted without access to and use of the protected health information.

8.2 We are requesting a waiver of consent for aim 1 as this research study presents no more than minimal risk of harm to participants and involves no procedures for which written consent is normally required outside of the research context. The waiver will not adversely affect the rights and welfare of participants. The research could not practically be conducted without the waiver. Participants will not be provided with additional pertinent information after participation. We have reviewed HRP-410 Checklist (Wavier or alteration of consent process) and summarize details below:

- This study is not FDA-regulated, does not involve non-viable neonates, or newborn dried blood spots.
- This is a minimal risk study.
- The waiver does not adversely affect the rights or welfare of the subjects.
- We could not carry out this study without the waiver due to applying quality measure definitions to the entire patient population.

- As cases will not know that they are involved in a research study, no additional information will be provided.

Aim 2: Qualitative/Interview potion of the study

8.3 Verbal consent will take place prior to beginning the scheduled interview. Upon scheduling, the consent information will be emailed to the participant to allow them time to review. At the start of the interview, the interviewer will review the consent information and ask if the participant has any questions or concerns. The participant will have as much time as they need to review and discuss the consent process, we anticipate that reading and discussing the consent script will take approximately 5 minutes. The interviewer will complete and sign the verbal consent form. This will be kept in a locked file cabinet in division offices.

8.4 The participant will have ample time to ask questions about the consent form. Declining to participate will in no way affect their practice, patients, or employment.

8.5 This study will not include cognitively impaired adults or adults who are not able to consent.

Aim 3: Pilot test of clinical decision support tools

8.6 Study staff will share electronic version of consent document prior to meeting in-person to discuss. Clinicians will be given a chance to review the document with study staff and ask any questions they have. If a clinician chooses to participate, study staff will share a copy of the signed consent document with participant.

9.0 Process to Document Consent:

Aim 1: Not applicable.
Aim 2: We are asking for a waiver of documentation of consent. We will obtain and document verbal informed consent. Most of these interviews will be via telephone. We have reviewed HRP-411 Checklist (Wavier of written documentation of consent). Briefly, we've listed below applicable information:

-The written script will be provided via email and read over the phone or in person and all information will include the required and appropriate elements of consent disclosure.

-The research is no more than minimal risk of harm to subjects.

-The research involves no procedures for which written consent is normally required outside of the research context.

-Written information describing the research will be provided via email to the subject.

9.2 Only English speaking participants will be enrolled.

Aim 3: We will collect written informed consent from participating clinicians. The consent form is attached within eIRB.

10.0 Risks to Participants:

10.1 There is a small risk of loss of confidentiality with the collection of data from the EDW for all aims of this project. Every effort will be made to avoid this risk.

10.2 Individuals involved in all aims of this study will be subject to minimal risk through their participation. The study collects information about clinicians' clinical

decision making. While we work to keep this information confidential, there is a risk of loss of confidentiality.

10.3 All efforts will be made to eliminate this risk. In aim 2, subjects may refuse to participate in the study. Whenever appropriate, the subjects will be provided with additional pertinent information after participation.

10.4 In aim 2 and 3, participants can withdrawal from the study at any time. If a participant decides to withdrawal after their interview, but before analysis, we will remove their comments from the analysis. If they want to withdrawal after completion of the analysis, their comments may be used in the final analysis, but will not contact them at any time for any further information. We will turn off study clinical decision support as soon as possible for a clinician that requests to withdraw from aim 3.

10.5 We do not anticipate the need to remove participants from the research study without their approval. This may happen in the rare circumstance of a mechanical problem with the audio recording for aim 2 in which responses could not be fully interpreted or if there is sufficient data to complete the study and additional data may not be needed.

11.0 Potential Benefits to Participants:

11.1 There are no direct benefits to participants in any aim this study. The knowledge gained from this study however, will help clinicians and others in the healthcare industry better understand why clinicians make certain treatment choices. This has the potential to benefit patient care.

12.0 Financial Compensation:

12.1 Aim1: Not applicable
Aim 2: We will provide $50 in compensation to clinicians for participating in the interview. We will mail a $50 Target gift card within 2 weeks of a phone interview and give the card at in-person interviews.
Aim 3: Participating clinicians will receive $100 cash at the enrollment visit and $150 cash at the end of the six month study period.

13.0 Provisions to Protect the Privacy Interests of Participants:

13.1 All email communication will be through the Northwestern email system. Interviews and study enrollment visits will be conducted in a secure quiet location.

13.2 The following study team members will have access to de-identified data produced form this study. The only individuals who will see identified data for Aim 1 are study analysts. The only individuals who will see identified data for Aim 2 and 3 are Rowe, Persell, Lee and Brown.

Team Member	Institution	Expertise
Stephen Persell, MD, MPH	NU	Primary care, internal medicine, clinical informatics, quality improvement, performance measurement, clinical trials
Theresa Rowe, DO, MS	NU	Geriatrics, infectious disease, internal medicine
Craig Fox, PhD	UCLA	Behavioral decision theory, decision under risk and uncertainty
Noah Goldstein, PhD	UCLA	Persuasion, social influence, behavior change

Jeffrey Linder, MD, MPH	NU	Primary care, informatics, antibiotics use, decision support, health system interventions
Jason Doctor, PhD	USC	Behavior change, changing clinician behavior
Daniella Meeker, PhD	USC	Informatics, data science, performance measurement
Mark Friedberg, MD, MPP	RAND	Primary care, performance measurement, program evaluation
Jody Ciolino, PhD	NU	Biostatistics, clinical trials
Darren Kaiser, MS	NMHC	Medical informatics, clinical decision support

14.0 Confidentiality and Data Management:

Aim 1: EHR data collection portion of the study

14.1 Data will come from the EDW. Only designated members of the research team will have access to this data. Only data from eligible subjects will be analyzed. Descriptive analyses including frequency, counts and percentages will be used to summarize the sample. Any investigator receiving data from the EDW for this project must be on the Authorized Personnel listed in the IRB documentation. In the event that the investigator does download data containing PHI (names, dates, SSN, MRNs), the investigator must download and store the data to an encrypted device. The data must be stored as described in the IRB documentation for this project. Emailing of data from the EDW containing PHI is not permitted and will not be done.

For a sample of cases, we will perform a manual physician chart review of Epic EHR documentation to examine the clinical circumstances that led to the performance of the clinical service (urine testing, PSA testing, or diabetes treatment with insulin or oral hypoglycemic drug). These will be conducted only by authorized study personnel who are physicians.

All study personnel will be trained in HIPAA-compliant procedures. Data will be kept on a password protected drive on a secure network, to which study personnel will have access. Transmission of data will not be necessary.

Aim 2: Qualitative/Interview portion of the study

14.2 For qualitative responses, we will perform qualitative analysis with two coders. All audio-recorded interviews will be transcribed and written notes for the interviews that were not audio-recorded will be compiled. The coders will use the inductive approach of latent content and constant comparative analysis on the detailed interview notes to organize the content into operational categories. The coders will initially identify individual focal themes, and then overarching themes, that emerge from response notes. Next, the coders will convene to compare and compile findings; creating a list of categories and major themes, until consensus is obtained and both coders believe that the saturation of themes has been reached. Any discrepancies will be resolved through discussion. Data will be collected on a password-protected, encrypted laptop. Data will only be accessible by members of the research team. Backup data will be kept on a shared drive only accessible by members listed on the IRB protocol. The data will be de-identified and labeled using unique study identifiers. MaxQDA software will be used. The identification key linking study participants to their interview data will be kept on a password protected drive on a secure network or in a locked file cabinet.

- Power analysis: N/A
- Interviewers will ensure that all interviews are captured in full on audio-tape if the subjects provide consent. Subjects may request for the interview not to be recorded from the start or they may request for the audio recorder to be turned off at any point during the interview.

Aim 3: Pilot Study

All outcome data will be obtained from EDW. Only authorized research team members will have access to identified data. No identified data will be shared external to Northwestern University.

15.0 Data Monitoring Plan to Ensure the Safety of Participants:

15.1 The greatest anticipated risk is that of a possible loss of confidentiality; data integrity and security will be monitored to ensure that this is not breached.There are no anticipated untoward events and issues of efficacy in this portion of the study.

15. 2 Review of cumulative data will be monitored on an ongoing basis as interviews will be transcribed as they are done. For the R21 portion of this study (this protocol), we will not have a data safety and monitoring board. We have developed a data safety and monitoring plan and have attached as a supporting document within eIRB+. We have also attached the 2019 Q1 interim safety report within eIRB+.

16.0 Data and if applicable, Specimen Banking:

16.1 All interviews will be audio-recorded if the subject provides consent. The audio recorder may be turned off at the subject's request at any point during the interview. If a subject does not wish to be recorded, then the interview will proceed without any audio record. This data will be de-identified and kept on a password protected drive on a secure network.

Release of these interview data will not be identifiable to other researchers and will not be released to other researchers

17.0 Qualifications to Conduct Research and Resources Available:

17.1 Personnel Qualifications

Northwestern University (NU), Feinberg School of Medicine:

Dr. Stephen Persell (PI): Director of the Center for Primary Care Innovation in the Institute for Public Health and Medicine, is an Associate Professor of Medicine in the Division of General Internal Medicine and Geriatrics and a practicing internist. He and Northwestern team members have performed multiple pragmatic clinical trials and quasi-experimental studies related to changing clinician practice and improving the quality of care including many studies that have used EHR-delivered applications. He has collaborated extensively with collaborators at USC, UCLA and RAND on the Use of Behavioral Economics to Improve Treatment of Acute Respiratory Infections study (1RC4AG039115)

Dr. Jeffrey Linder: Chief of the Division of General Internal Medicine and Geriatrics at Northwestern University.

Dr. Theresa Rowe: Geriatrician with additional clinical expertise in infectious disease.

University of Southern California (USC), Leonard Schaeffer Center for Health Policy and Economics:

Dr. Jason Doctor: Associate Professor in the School of Pharmacy and Director of Health Informatics at the Schaeffer Center. His research focuses on the decision making in healthcare and the application of behavioral economics to healthcare applications. Dr. Doctor is the principal investigator on the Use of Behavioral Economics to Improve Treatment of Acute Respiratory Infections. He will not have access to, or be involved with any protected health information.

Dr. Daniella Meeker: Assistant Professor who directs the Clinical Informatics Program in the Southern California Clinical Translational Sciences Institute who specializes in quality measurement using EHR data. She will not have access to or be involved with any protected health information.

RAND

Dr. Mark Friedberg is a Senior Physician Policy Researcher, the director of RAND's Boston office, and a practicing primary care internist. He was heavily involved in development, execution and evaluation of the Use of Behavioral Economics to Improve Treatment of Acute Respiratory Infections study and has expertise with measure specifications for study outcomes and in the design of EHR-based interventions. He will not have access to or be involved with any protected health information.

***University of California Los Angeles (UCLA) Anderson School of Management's Behavioral Laboratory*:**

Dr. Noah Goldstein is Associate Professor and the Director of the Laboratory and Dr. Craig Fox is the Harold Williams Chair in Management, Professor of Strategy, Psychology and Medicine. Their expertise includes the study of decision making under uncertainty or risk, social persuasion, and behavior change. They helped develop the interventions used in the Use of Behavioral Economics to Improve Treatment of Acute Respiratory Infections study and have collaborated extensively with the other members of the research team on that project. He will not have access to or be involved with any protected health information.

17.2 Facility Qualifications

Northwestern Memorial Healthcare (NMHC): This is the larger organization that currently encompasses 4 regionally located medical groups and 5 hospitals, and continues to enlarge. NMHC includes the North and Central Regions of the Northwestern Medical Group (NMG) which has approximately 25 outpatient primary care clinical locations and the Regional Medical Group (RMG) which includes approximately 30 primary care practice locations. For this study, only NMG clinical sites will be included.