LOCAL IMPLEMENTATION PLAN (LIP)

****NOTE: This protocol refers to a study titled "Screening Parents about Recommended Care for Kids (SPARCK) Study", which is the study name we used to refer to the Screening for Hesitancy to Optimize Talk (SHOT) trial when conducting the trial. The SPARCK Study and SHOT Trial are therefore synonymous, and this protocol is therefore the study protocol for the SHOT trial.**

PART I

***Fill in header information.**

Key:
(Text highlighted throughout form are hyperlinks to these types of information)

Investigator Help (includes background information and/or sample answers)
Federal Regulations
Seattle Children's Policy

Type in text as appropriate (for text boxes, etc.)

Instructions:

- **This form is required for new study submissions; it should be submitted with the Institutional Review Board (IRB) – Institute of Translational Health Sciences (ITHS) Application and any relevant Supplements.**
- Answering the questions posed in this form, provide a summary of your Local Implementation Plan (LIP). The purpose of this document is to provide a summary of how your study will be implemented at Seattle Children's.
- The LIP is considered a "living" document that should be updated and submitted to the IRB with each modification or renewal that involves change to the LIP.

Note: There are two (2) Parts to this form

- Part I must always be completed.
- Part II must be completed if there is no protocol provided. If a protocol is attached, then Part II may be skipped.
- Please note that protocol templates have been developed for optional use. These are available on the IRB Web site.

1. Summary of the Research (1 to 1 ½ pages or less)

1.1. Concise Description

Using lay language, please provide a concise summary outlining the purpose of the research, the rationale for this study and the general study design (how the aims of the study will be

accomplished). The description should be detailed enough to allow someone who is not an expert in the field to understand the context of the research question(s) being asked.

Parental refusal or delay of childhood vaccines due to vaccine concerns is an important contributor to under-immunization[1,2] and a growing public health problem.[3-5] Non-medical exemption rates from required school entry vaccines are rising[6,7] and vaccine refusal increases the risk of developing and transmitting vaccine-preventable diseases (VPD).[8-12] Consequently, it remains a national priority to sustain and improve childhood vaccine coverage.[14]

Important candidates for targeted interventions to improve acceptance of vaccines are vaccine hesitant parents (VHPs),[15] a large, heterogeneous group of parents who refuse or delay ≥1 vaccines.[16,17] Compared to parents who completely reject vaccines, VHPs may be more amenable to behavior change because they hold less negative vaccine attitudes and beliefs[16-20] and they consider their child's pediatric provider to be influential in their decision-making about vaccines and their child's health.[1,16-18,21] Parents initially hesitant to accept a vaccine have changed their mind after their child's provider addressed their concerns, provided them with additional information, or gave them reassurance.[17,21,22]

Several barriers, however, exist to optimizing provider-parent vaccine discussions. Both parents and providers cite insufficient time to discuss parental vaccine concerns during health supervision visits.[23-28] Parents also have difficulty openly discussing their vaccine concerns[29,30] and providers struggle to accurately identify VHPs and their specific vaccine concerns.[31] As a result, parental vaccine concerns are often neglected[16] and opportunities to improve vaccine uptake are missed.

The primary goal of this project is to evaluate the effectiveness of an innovative intervention designed to address barriers to parental acceptance of vaccines—the Screening Parents about Recommended Care for Kids (SPARCK) intervention—in improving provider-parent vaccine discussions and increasing vaccine acceptance. The SPARCK intervention involves administering a validated parent-report measure, the Parent Attitudes about Childhood Vaccines (PACV) survey[32-34] (Appendix A), to parents and communicating their score and item-specific responses to their child's provider before their child's 2 and 6 month health supervision visits (Appendix C). The PACV contains 15 questions regarding Health Belief Model concepts that influence parent vaccination behavior and has been shown to predict under-immunization. We hypothesize that using the PACV to solicit parental vaccine concerns and hesitancy status prior to health supervision visits in which vaccines are administered will improve providers' ability to adequately address parental vaccine concerns and increase parental vaccine acceptance.

<u>The specific aims of this project are as follows:</u>
Aim 1: Evaluate the impact of the SPARCK intervention on a child's immunization status. We will use a matched-pair, cluster randomized controlled trial design in which we assign up to 30 primary care clinics in the Seattle area and within the Group Health healthcare delivery system in Western Washington to a control arm or the SPARCK arm and enroll 160 vaccine-hesitant parents whose newborns receive health supervision at study clinics.
Aim 2: Assess how parents' ratings of their vaccine discussions with their child's provider change as a function of the SPARCK intervention. This will be accomplished by

assessing parent visit satisfaction with a questionnaire after their child's 6 month health supervision visit.
Aim 3: Compare pre- and post-study perceptions of barriers to quality vaccine discussions with parents between providers in the SPARCK and control arm. This will be accomplished by having providers complete a survey assessing their perceptions of specific barriers to quality preventive care discussions with parents before the study begins and then again after the study ends.

Investigator Help

2. Local Study Population

Investigator Help

2.1 Approximate Number and Ages of Study Population

Participant Group: Parents/Children			**Age at Enrollment***
	Non-Children's Sites		
	Screen	**Enroll**	**Entire Study**
Healthy Participants/Controls			
Parents	Approximately 2400	Approximately 160	18+ years
Other: Children [indirectly] of enrolled parents	Approximately 2400	Approximately 160	Newborn-8 months

*If participants will be greater than age 21 (not including parents participating with their children), institutional sign-off will be required.

Participant Group: Providers			**Age at Enrollment***
	Non-Children's Sites		
	Screen	**Enroll**	**Entire Study**
Group Health Primary Care Pediatric Providers	Approximately 289	Approximately 200	18+ years
Seattle area Pediatric Primary Care Clinic Providers	Approximately 100	Approximately 85	18+ years

Seattle Children's Policy

3. Recruitment: Screening and Approach of Local Study Population

Screening and Approach

Investigator Help

Seattle Children's Policy

3.1. **Indicate how local team will advertise for/identify potential participants for approach (e.g., medical records, other studies, etc.). Please check all that apply & provide with application:**

☐ Web site ☐ Other studies
☐ Flyer(s) ☐ Advertisement(s)
☐ In person through clinic ☒ Medical records/Clinic schedules (Parents/Children)
☒ Existing databases (Parents/Children) ☒ Other (please explain): We will send clinic leaders at Group Health primary care clinics in a 5 county region in western Washington and other Seattle area pediatric primary care clinics an email that explains the study and invites their clinic to participate (Appendix H). Among those clinics whose leaders agree to participate, all pediatric and family practice providers (MD, DO, ARNP, PA-C) at those clinics will be eligible to participate in the study survey.

3.2. **Once identified as possible participants, describe how individuals will be approached about the research (check all that apply):**

☒ In person (e.g., during clinic visit/hospital stay) (Parents/Children attending Seattle area primary care clinics and Group Health clinics)
☐ By letter
☒ By telephone – investigator initiated (e.g., investigator makes first contact) (Parents/Children attending Group Health clinics only)
☐ By telephone – participant initiated (e.g., potential participant makes first contact)
☒ Other (please explain): Providers at participating clinics will receive an email from the research team that explains the study (Appendix I).

3.3. **Describe who will approach potential participants about the research.**

Parents/Children: A Group Health RA will approach parents at Group Health clinics. A Seattle Children's RA will approach parents at non-Group Health clinics.
Providers: After clinics are enrolled, Drs. Opel, Henrikson, and Dunn will send an email to all providers at that clinic inviting them to participate in the study survey(Appendix I).

3.4. **Describe where (e.g., sites, clinics, units, etc.) potential participants will be approached about the research.**

Parents/Children: Group Health parents will be approached over the telephone or in the waiting room of their child's doctor's office. Non-Group Health parents will only be approached in the waiting room of their child's doctor's office.
Providers: Providers will receive an email (Appendix I) that explains the study.

3.5. **If you are recruiting/approaching potential participants from more than one site/location, do your recruitment/approach strategies differ at each site/location?**

☐ Yes → Describe your recruitment practices at each site/location.
☒ No
☐ N/A

3.6. **Describe when (the timing of) potential participants will be approached about the research.**

Parents: Parents will be recruited at or prior to their child's 2 month check-up.
Providers: Providers at eligible clinics will be emailed to ask for their participation in the study survey only after clinic leadership has agreed to participate in the study.

3.7. **Are recruitment/approach materials attached to the application (e.g., flyers, advertisements, approach letters, telephone script, etc.)?**
☒ Yes → Please list.
1. Parent Eligibility Survey (Appendix F)
2. Clinic leadership recruitment email (Appendix H)
3. Provider study introduction email (Appendix I)
4. Provider study introduction reminder email (Appendix O)
5. Provider study fact sheet (Appendix J)
6. RA in-person recruitment script (Appendix N)
7. RA telephone recruitment script (Appendix P)

☐ No → Please explain why.

Investigator Help
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3.8. **How will the approach protect the privacy of research participants and their families?**
☒ Use of a private room to discuss potential participation.
☐ Use of an intermediary known to potential participant if s/he does not know researcher (usually required).
☒ Other (please explain):
Parents: Parents will be approached in clinic waiting rooms (or over the phone prior to a clinic visit if they are a Group Health parent). If they are approached in the waiting room they will be offered the opportunity to learn more about the study in a private room or private area of the waiting room. Participants will be given a unique study ID that contains their study information. For those newborn/parent dyads who choose not to participate or are ineligible, their names will be the only identifiable information retained until the end of study recruitment to avoid approaching them in the future. This is necessary given the longitudinal nature of the study. Names will not be shared outside the research team.

Providers: Providers will be sent an email that they may view privately which includes a description of the study. Providers who take the survey (the link to which will be included in the email; see AppendicesI and Q), will be given a unique study ID that contains their study information so will not be directly identifiable.

3.9. **What steps will be taken to avoid coercion or undue influence in the approach/recruitment process? Please check all that apply:**
☒ Sufficient time will be allowed to consider participation. Please describe amount of time allowed and rationale.
Parents: It is estimated that the recruitment and consent process will take about 10 minutes to complete. We hope to complete the approach/recruitment process over the phone prior to a clinic visit (for Group Health parents) or while the parent is in the waiting room prior to being called back to the exam room. For Group Health parents

who we screen by phone, we will attempt to contact them up to 3 times total over the phone and leave 1 voicemail. The RA will emphasize that participation is voluntary and that they may stop the study at any time.
Providers: Providers will be allowed several days to weeks to consider participation. Regarding the survey component of the study, providers will not be re-contacted for 3-5 days if no response is received. We will recontact survey non-responders by email up to 3 times(see Appendices O and R-provider reminder email)..

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☒ No individual in a position of authority/influence (e.g., treating physician) will approach potential participants for participation in the study.
☐ Individual(s) in a position of authority/influence (e.g., treating physician) will approach potential participants but there will be steps taken to avoid coercion/undue influence. Please describe those steps and rationale.
☒ Emphasis on concept that deciding not to participate will not impact patient's care.
☐ Other (please explain).

4.. Study Incentives

Investigator Help
Seattle Children's Policy

4.1 Will research participants receive an incentive to take part in the research activity (e.g., gifts, payments, services without charge)?
☒ Yes → Answer the following questions 4.2 – 4.5.
☐ No → Skip to section 4.5.

4.2 Describe the incentive and the reason for this incentive.
Parents will receive a $10 gift card after enrollment and a $15 gift card after they complete the 6 month post-visit satisfaction survey to thank them for participating.

Investigator Help

4.3 Describe who will receive the incentive payment (child, parent, etc.).
See 4.2

4.4 Describe the amount, method (check or gift cards), and timing (schedule) of the incentive payments. See 4.2

Investigator Help

4.5 Are there any plans to provide incentives to persons who help in recruiting participants for the study?
☐ Yes → Please Explain.
☒ No

Investigator Help
Seattle Children's Policy

5. Study Conduct

Data Collection

5.1 Indicate the manner in which data will be recorded (check all that apply):

☒ Forms → Attach all data collection forms.

☐ Audio/Video/Photograph data → The recordings should be described in the consent form, or in a separate addendum consent.
☐ Participant diary → Attach a sample form.
☒ Surveys, questionnaires, interview scripts → Attach at the time of initial review.

The following recruitment and data collection materials are attached:

1. Parent SPARK intervention survey (Appendix A)
2. Parent placebo survey (Appendix B)
3. Parent post-study survey (Appendix E)
4. Parent Eligibility Survey (Appendix F)
5. Parent demographic survey (Appendix G)
6. Clinic leadership recruitment email (Appendix H)
7. Provider study introduction email (Appendix I)
8. Provider study fact sheet (Appendix J)
9. Provider baseline survey (Appendix K)
10. Provider follow-up survey (Appendix L)
11. Parent in-person recruitment Script (Appendix N)
12. Provider study introduction reminder email (Appendix O)
13. RA telephone recruitment script (Appendix P)
14. Provider post-study follow-up email (Appendix Q)
15. Provider post-study follow-up reminder email (Appendix R)
16. Vaccine data collection form for Allegro Pediatrics sites (Appendix S)

☐ Other → Describe and attach:

5.2 Please provide a complete list of all questionnaires/assessments below that will be used for the study. As noted above, copies only need to be provided at initial review, except if the questionnaires are modified after study approval, in which case updated versions should be submitted with the modification request.

Name of Questionnaire/Instrument	**How will the questionnaire/instrument be administered?** (Examples: study personnel, self-administered, computer, etc.)	**Who answers the questionnaire?** (Examples: parent, child)	**If modified after initial approval, note current revision date:**

Name of Questionnaire/Instrument	**How will the questionnaire/instrument be administered?** (Examples: study personnel, self-administered, computer, etc.)	**Who answers the questionnaire?** (Examples: parent, child)	**If modified after initial approval, note current revision date:**
Parent SPARCK intervention survey (Appendix A)	Self-administered on iPad®	Parent	
Parent SPARCK Placebo Survey (Appendix B)	Self-administered on iPad®	Parent	
Parent post-visit satisfaction survey (Appendix E)	Self-administered on paper	Parent	
Parent Eligibility Survey (Appendix F)	Study personnel verbally	Parent	
Parent demographic survey (Appendix G)	Self-administered on paper	Parent	
Provider Baseline Survey (Appendix K)	Self-administered electronically	Provider	
Provider Follow-Up Survey (Appendix L)	Self-administered electronically	Provider	
Vaccine data collection form for Allegro Pediatrics sites	Study personnel	Study personnel	

Duration of Study

5.3 Explain how long the study visits will last for individual research participants, and how long they will participate in the overall study.

Parent/child participation for each study visit will be confined to the day of the child's 2 and 6 month health supervision visits.
Providers will participate for the duration of the study (approximately 15 months).

Investigator Help

6. Research and Test Results

6.1. **Plan re Sharing Overall Research Results with Participants: In relation to the sharing of "overall, collective" research results, explain what information participants will receive at what point in the research, and who will convey the information to participants. In the alternative, please explain why such overall study results will not be shared.**

Return of overall study results: Parents and providers will be told that they can receive copies of publications resulting from the study by contacting the PI.

Investigator Help

6.2. **Plan re Sharing Individual Research Results with Participants: In relation to the sharing of "individual" research results, explain what information (e.g., referral to appropriate practitioners) the participants or care practitioners will receive at what point in the research, and who will convey the information. In the alternative, please explain why such individual research results will not be shared.**

Return of individual results: There are no plans to disclose individual results to the participants. This study is designed to guide future practice and improve vaccine discussions between future patients and their providers.

Investigator Help

6.3. **Are results of the research likely to have diagnostic, predictive, or reproductive implications (positive or negative) for the participants?**
☐ Yes → Answer questions 6.3.1 - 6.3.2.
☒ No → Skip to question 6.4.

6.3.1 Please explain.

6.3.2 Include information about the plan to place results in participant medical records. If you are including results from the research in the medical records, then be sure that the consent forms explain this to the participant.

6.4. **Interim/Inconclusive Results: If applicable, explain how interim or inconclusive results will be handled with respect to the research participants and care practitioners. If not applicable, please indicate "N/A".** N/A

Investigator Help

Laboratories

6.5. **If you plan to provide test/research results to participants or care practitioners but plan to use an outside lab for this purpose, please explain why (rare exception): N/A**

Investigator Help

6.6. **Does the proposed research involve a laboratory, which will report patient or participant results for the diagnosis, prevention or treatment of any disease or impairment, or the assessment of patient or participant results?**
☐ Yes
☒ No → Skip to section 7: Protocol.

6.7. **Is the laboratory certified?**
☐ Yes → Skip to section 7: Protocol.
☐ No → Answer question 6.8.

6.8. **If the laboratory is not certified, will data from the laboratory be shared with physicians, counselors, the participant or participant family?**
☐ Yes → Please explain.

Investigator Help

☐ No

7. Protocol

7.1. **Does your study have an existing protocol that the local investigative team must implement (e.g., industry sponsored, etc.)?**
☐ Yes → Please attach protocol and answer question 7.1.1. After answering 7.1.1, you are finished w/the LIP.
☒ No → **Please complete Part II of the LIP OR** you may submit a protocol based on one of the following templates provided for your convenience.
☐ Basic Protocol Template
☐ Biomedical / Interventional Protocol Template (including Pharmacokinetics and Pharmacodynamics Studies)
☐ Behavioral / Interventional Protocol Template
☐ Observational Protocol Template

7.1.1. **Are there any planned differences between the study protocol and the plan for implementation at Seattle Children's?**
☐ Yes → Please describe. *(For example – At Seattle Children's, we will only enroll into the first two arms of the study because…)*
☒ No → Study will be conducted as described in the attached protocol.

LOCAL IMPLEMENTATION PLAN

PART II

Note: You may choose to attach a protocol instead of filling out this Part II.

Investigator Help

8. Background / Rationale for the Study

8.1. **Describe the background and rationale for the study.**

National estimates for the percentage of 19 – 35 month old children who are up-to-date on recommended vaccines remain below the *Healthy People 2020* goal.[13] An important contributor to under-immunization is parental refusal or delay of childhood vaccines due to significant vaccine concerns.[2,35] **Since vaccine refusal heightens the risk of developing and transmitting vaccine-preventable disease,[8-12] efforts to sustain and improve childhood vaccine coverage remain a national priority.[14]** However, there are few well-designed and rigorously evaluated interventions to reduce parental vaccine hesitancy or refusal.[36]

Important candidates for targeted interventions to improve acceptance of vaccines are vaccine hesitant parents (VHPs),[15] a large, heterogeneous group of parents who refuse or delay ≥1 vaccines.[16,17] Compared to parents who completely reject vaccines, VHPs may be more amenable to behavior change because they hold less negative vaccine attitudes and beliefs[16-20] and they consider their child's pediatric provider to be influential in their decision-making about vaccines and their child's health.[1,16-18,21] Parents initially hesitant to accept a vaccine have changed their mind after their child's provider addressed their concerns, provided them with additional information, or gave them reassurance.[17,21,22]

Additionally, pediatric providers are an important influence on parental vaccine decision-making.[1,2,16-18,21,23,24,29,37-42] In particular, their vaccine discussions with parents can increase vaccine acceptance.[17,21,22] However, several parent- and provider-level barriers to improving the vaccine discussion exist. Parents have trouble openly discussing their vaccine concerns with providers,[29,30] providers struggle to accurately identify parental vaccine concerns,[31] and both cite insufficient time during health supervision visits to adequately discuss vaccines.[23,25-28,42]

We have developed and validated a novel parent-report measure—the Parent Attitudes about Childhood Vaccines (PACV) survey—to identify vaccine-hesitant parents (VHPs) and their specific vaccine concerns. The PACV contains 15 questions regarding parents' vaccine attitudes, beliefs, and behavior, reads at a 6 – 7th grade level, takes <5 minutes to complete,[32,33] and predicts under-immunization.[34] Use of validated parent-report measures in pediatric primary care contexts have been found to be an efficient way to triage visits that may require more time for assessment.[43] They also enhance provider-parent communication by facilitating discussion of parental concerns,[44] increase early identification of problems and access to beneficial interventions,[45,46] and improve outcomes.[47] This study will be the first to

demonstrate the effect of integrating a screening tool for vaccine hesitancy into the clinical setting on parental acceptance of childhood vaccines.

Investigator Help

9. Study Objectives

Describe the objectives (aims) of the study.
The primary goal of this project is to evaluate the effectiveness of an innovative intervention designed to address barriers to parental acceptance of vaccines—the Screening Parents about Recommended Care for Kids (SPARCK) intervention—in improving provider-parent vaccine discussions and increasing vaccine acceptance. The SPARCK intervention involves administering our validated parent-report measure, the Parent Attitudes about Childhood Vaccines (PACV) survey (Appendix A), to parents and communicating their score and item-specific responses to their child's provider before their child's 2 and 6 month health supervision visits.

Investigator Help

9.1. **Primary objective (or aim):** To evaluate the effectiveness of the SPARCK intervention in increasing vaccine acceptance.
9.2. **Secondary objectives (or aims): (1)** To assess how parent-rated experience of the vaccine discussion changes as a function of the SPARCK intervention and **(2)** to characterize the effect of the SPARCK intervention on provider perceptions of barriers to quality vaccine discussions.
9.3. **Outcome measures and rationale for selection:** The primary outcome measure will be child's immunization status at 8 months of age. Our secondary outcomes will be **(1)** parent ratings of their visit experience and vaccine discussion with their child's provider after the 6 month health supervision and **(2)** pre- and post-study provider perceptions of barriers to quality vaccine discussions with parents. These outcomes will allow us to measure the effectiveness of the SPARCK intervention.

10. Study Medication / Study Intervention

10.1. **Describe the study medication or study intervention (if applicable).** Parent participants randomized to the intervention arm will receive the intervention survey (within which the PACV is embedded) before their child's 2 and 6 month health supervision visits (Appendix A). These results will be communicated to their child's provider in paper form (Appendix C) before the provider enters the exam room for each of these visits.

10.2. **Describe the study agent (include dosing and rationale for dosing) or study intervention (include who will provide the intervention/therapy, when and where, as applicable).** Parents will complete the intervention survey (Appendix A) on a study iPad® in their child's clinic prior to their child's 2 and 6 month health supervision visits.

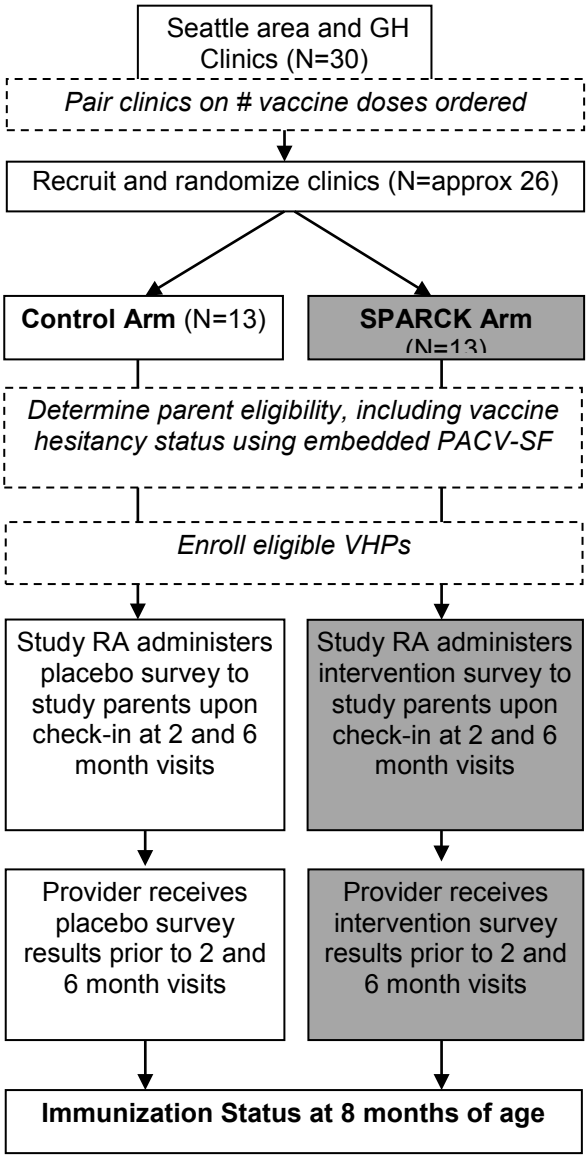
10.3. **Describe treatment compliance and adherence assessment.** N/A

Investigator Help

11. Investigational Plan

11.1. **Describe the general schema of the study design.**

Figure 1. Study Design



This study is a cluster randomized controlled trial. We will pair up to 30 Seattle area primary care clinics and Group Health primary care clinics based upon the number of vaccine doses ordered and enroll and randomize clinics to control and SPARCK arms. We will screen parents for vaccine hesitancy using the Parent Attitudes about Childhood Vaccines Short Form survey (PACV-SF) (Appendix F). Parents in the SPARCK arm of the study will take the intervention survey (which has the PACV embedded in it) to their child's 2 and 6 month visits (Appendix A) whereas parents in the control arm of the study will take a placebo survey about childhood health topics (Appendix B). The results of these surveys will be communicated to the child's provider (Appendices C and D). After the child's 6 month visit, parents in both arms will complete a satisfaction survey about their visit experience (Appendix E). When the child is 8 months of age, we will use an automated clinic immunization database to determine their immunization status. For participants who were lost to follow up (i.e. those who did not have a 6 month appointment, or those who did not have a 2 and 6 month appointment), we will also use Washington State Immunization information System records to determine participant immunization status.

Investigator Help

Trial Phases

11.2. **Describe the trial phases (if applicable).** N/A

Control Group

11.3. **Describe the control group (if applicable).** Parents in the control arm will receive a placebo survey that asks questions about their attitudes about childhood health topics (Appendix B). These results will be conveyed to their child's provider (Appendix D).

Randomization Method and Blinding

11.4. **Describe the randomization method and blinding (if applicable).**
Among interested Seattle area primary care practices and 21 Group Health primary care clinics in 5 western Washington counties (King, Snohomish, Pierce, Thurston, and Kitsap), we will pair clinics based upon the number of vaccines doses ordered in the prior year and subsequently enroll and randomize up to 30 to the control and SPARCK intervention arms. We will conceal study arm allocation and describe the study generally as one that seeks to determine the impact of soliciting parent attitudes regarding preventive care topics before health supervision visits on improved health outcomes.

Investigator Help

Plan for Non-Responders

11.5. **Describe the plan for non-responders (if applicable). N/A**

11.6. **Define who will be considered a "non-responder". N/A**

11.7. **Describe the alternative therapy non-responders will be transitioned to, the rationale for that therapy, and when they will be transitioned to the alternative. N/A**

11.8. **Explain how non-responders will be followed and for what variables. N/A**

11.9. **Discuss risks of transition and measures taken to minimize risks. N/A**

Early Withdrawal of Participants

11.10. **Describe potential reasons for withdrawal, plan for tracking withdrawals, how participants' safety will be assessed in response to withdrawal, plan for follow up of withdrawn participants.**
Parents and providers may withdraw at any time. A wish to no longer spend time filling out surveys may be the reason that parents and providers withdraw. If parents or providers withdraw before the study ends, we will consider this as missing data. We will

not follow up with withdrawn participants. Our sample size and power calculations account for this expected attrition.

12. Study Population

12.1. **Describe inclusion criteria.**

Parents: Parents must be English speaking, ≥18 years old, have a newborn singleton infant ≤2 months, born at ≥35 weeks gestation who is receiving pediatric care at an enrolled Seattle area clinic or Group Health clinic, and be vaccine hesitant (defined as ≥2 positive responses on questions 1, 3, 6 and 8 on the eligibility screening survey (Appendices F and P); these questions constitute the PACV-SF).

Newborns: Newborns 0 – 2 months old whose parents enroll in the study will be included.

Providers: All Seattle area primary care practices and Group Health primary care clinics within a 5 county region in western Washington (Snohomish, King, Pierce, Thurston, and Kitsap Counties) will be eligible to participate. Once clinic leadership has agreed to participate, all pediatric and family practice providers (MD, DO, ARNP, PA-C) at those clinics will be eligible to participate.

12.2. **Describe exclusion criteria.**

Parents/Children: Parents who are not 18 years or older, require language interpretation for medical care, have an infant born <35 weeks gestation, are not vaccine hesitant or will not be taking their child to a participating clinic for health supervision visits will be excluded.

Providers: Clinics and providers outside the Seattle area or 5 county region in western Washington (Snohomish, King, Pierce, Thurston, and Kitsap) will be excluded.

13. Study Procedures

This section should list the procedures, observations, measures, etc. at each study visit, including history, examination, study drug administration or other interventions (can be provided in table form as a Table of Evaluations often used in protocols).

13.1. **Describe study visits.** Parents will be approached and screened for this study by a research assistant (RA) over the telephone (Group Health parents only) or at their child's clinic upon check-in for their child's health supervision visit that occurs at or before 2 months of age. For Group Health parents who are screened over the telephone, an RA will meet the parent at their child's 2 month health supervision visit to complete the consent and enrollment process. This enrollment encounter will include having the parents who are eligible and agree to participate complete the demographic survey (Appendix G). If enrollment occurs at a health supervision visit prior to 2 months of age, an RA will meet the parent back at their child's clinic at the time of their child's 2 month health supervision visits to have them complete an electronic version of the study survey using an iPad® (i.e. the intervention survey at SPARCK clinics (Appendix A) and the placebo survey at control clinics (Appendix B)). If enrollment occurs at the 2 month health supervision visit, the RA

will simply proceed to administer the intervention or placebo survey right after enrollment. The RA will generate and print an automated summary sheet of the parent's screening results, and hand the printed summary sheet to the child's provider before the visit begins (Appendices C and D). They will also alert the provider that their patient is a SPARCK study participant by writing, "SPARCK STUDY" in the scheduling notes section of the child's electronic health record. This process will be repeated before the child's 6 month health supervision visit. After their child's 6 month health supervision visit, parents will complete a survey about their satisfaction with their child's provider at the clinic (Appendix E).

14. Study Evaluations

This section should list the details of all of the measurements, procedures, laboratory tests, etc. that are included in the Table of Evaluations including where they will be performed. Example: Hematology testing includes Complete Blood Count with differential performed in the Seattle Children's lab. In particular, non-standard tests should be described including specific sample collection information.

Information in this section can also be summarized in a table, or appended to the Table of Evaluations.

14.1. **Describe study evaluations.** Study evaluations are:

1. SPARCK Intervention Survey (Appendix A)
2. SPARCK placebo survey (Appendix B)
3. Parent post-visit satisfaction survey (Appendix E)
4. PACV-Short form screening survey (Appendix F)
5. Parent demographic survey (Appendix G)
6. Provider baseline survey (Appendix K)
7. Provider follow-up survey (Appendix L)
8. Child's vaccination status by age 8 months

15. Risks and Benefits

Potential Risks

15.1. **Describe the potential risks associated with this research.**

Parent/Child: Parents being recruited for the study may experience anxiety or discomfort because they do not meet inclusion criteria. Enrolled parents may experience anxiety or discomfort from having to complete questionnaires. In addition, participation in the project might be associated with some risks such as confusion about or disruption in the parent-provider relationship. In particular, parents may be concerned that their answers to the pre-visit screening questions might hurt their relationship with their child's doctor. Alternatively, they may feel inconvenienced by having to discuss their responses with their child's doctor. In total, however, the risks to parents and their children who participate in this study are minimal and are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests.

Providers: The main risk for providers in the study is the possibility of information on the immunization status of their child patients and/or parent-ratings of their vaccine discussions will be revealed to their colleagues, patients, or the public at large. Another risk is disruption in the parent-provider relationship. In particular, disclosure to providers of a parent's overall vaccine hesitancy or specific vaccine concerns may highlight disagreements between provider and parent and lead to a difficult conversation during the visit. In total, however, the risks to providers who participate in this study are minimal and are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests.

Investigator Help

Protection Against Risks

15.2. **Describe how the study design will prevent or minimize any potential risks or discomfort. Pease explain what steps you will take to minimize risks of harm and protect participants' rights and welfare. If the study procedures or intervention may pose possible harms to study team, family members or others, please also discuss methods of reducing risks here.**

Parent/Child: Data kept for research evaluation purposes on parents and children will be de-identified with linking information kept in separate files. Only Group Health and Seattle Children's study staff will have access to the linked file with identifying information for the purposes of conducting research. No individual parent or child data will be publicly reported and no individual will be identified in any published findings, with all study results analyzed and presented only at the aggregate level.

Drs. Opel and Henrikson will provide oversight for the collection, management and protection of study data. Data collected from Group Health parents will be securely stored at GHRI. Data collected from non-Group Health parents will be securely stored at SCRI. To ensure confidentiality and protection of the data, we will use the following strategies: 1) we will create a unique study ID for each participant in the study; 2) de-identified data will be placed on a secure, password-protected file transfer protocol server; and 3) all linkages between the unique study ID and the individual-level data will be destroyed 5 years after the completion of the study. We will adhere to all HIPAA requirements as required by the law. For Group Health parents, identifiable data will be stored in the GHRI Data Warehouse where access is limited to GHRI study staff, and data are backed up automatically at least nightly. For non-Group Health parents, data will be stored at SCRI where access is limited to SCRI study staff and data are backed up automatically at least nightly. We will maintain each dataset separately and index the records using unique encrypted identifiers to facilitate linkages between files while maintaining confidentiality of personal health information. Only de-identified data from Group Health will be sent to SCRI investigators for analysis.

Providers: No individual provider data will be publicly reported and no individual will be identified in any published findings, with all study results analyzed and presented only at the aggregate level. All survey data will be confidential. These data files will only contain a unique study ID for each survey and no direct identifiers. The electronic survey data files

will be stored at Seattle Children's Research Institute where access is limited to study staff.

Potential Benefits

15.3. **Describe potential benefits associated with this research.**

Parent/Child: Parents will receive a $10 gift card upon enrollment and a $15 gift card after completing the 4 and 6 month surveys to thank them for their time. Parents might also benefit from improved provider-parent communication by having their attitudes regarding preventive care topics explicitly solicited and conveyed to their child's provider. In the face of these potential benefits, the risks to study subjects, which themselves are minimal, seem reasonable.

Providers: There is no direct benefit for providers who participate in the study. Participating providers, however, may benefit from pre-visit knowledge of parental preventive care concerns if it increases parental satisfaction by reducing parental unmet concerns. In the face of these potential benefits, the risks to study subjects, which themselves are minimal, seem reasonable.

16. Statistical Considerations

This section should provide sufficient detail to permit assurance that the sample size is justified and the statistical methods sufficient and appropriate for the research question(s).

Analysis Plan and Statistical Methods

16.1. **Outline the data analysis plans relating to each specific aim/objective or research hypothesis mentioned in section 11 above.** It should be clear how the analysis results will allow each aim/objective to be answered. The analysis plans for the primary aim should be detailed. Analysis plans for secondary aims may be brief, but must be included. Give the names of specific statistical methods and state which variables will be used with them.

Aim1: To evaluate the effectiveness of the SPARCK intervention in increasing vaccine acceptance. We will conduct an intention-to-treat analysis for Aim 1. Parents will be the unit of analysis. We will examine baseline characteristics among control and SPARCK parents using Pearson's $\chi 2$ tests (or Fisher's exact tests) for categorical variables and t-tests for continuous variables to assess for any unbalanced confounders between control and SPARCK arms. To compare our primary outcome of percent days under-immunized between control and SPARCK arms, we will apply linear mixed effects regression modeling to the percent days under-immunized with clinic-specific random-effects to account for within-clinic correlation. If unbalanced confounders are detected between arms, they will be adjusted for in the mixed effects models.

Aim 2: To assess how parent-rated experience of the vaccine discussion changes as a function of the SPARCK intervention. For Aim 2, we will use Pearson's $\chi 2$ test to compare parent (binary) ratings of their vaccine discussion between control and SPARCK

arms. We will apply mixed effects logistic regression model to this outcome to account for within-clinic correlation and any unbalanced parent confounding factors. When summarizing parent experience as a continuous variable, we will apply Box-Cox transformation if it is highly skewed and linear mixed effect models to examine the differences in parent experience between control and SPARCK arms.

Aim 3: To characterize the effect of the SPARCK intervention on provider perceptions of barriers to quality vaccine discussions. For Aim 3, providers will be the unit of analysis. We will compare the pre- and post-study proportions of control and SPARCK providers reporting that time, understanding of specific parental vaccine concerns, and knowledge of overall parental vaccine attitudes were significant barriers (defined as 4 or 5 on a 1 – 5 scale) to quality vaccine discussions. We will use t-tests for an unadjusted analysis of the pre-post differences between control and SPARCK arms and multivariate linear regression for adjusted analyses that control for potential confounding variables such as provider demographic and practice characteristics.

16.2. **Provide a justification for the sample size and power calculations.**

Based on preliminary data, children of parents with a positive PACV-SF had a mean percentage of days under-immunized of 27.1% (standard deviation [SD] 33.3) from birth to 8 months of age for 4 vaccines combined (hepatitis B, DTaP, Hib, and IPV). To be able to detect with adequate power (90%) a decrease in under-immunization of 30 days per vaccine—a decrease that has the potential to be clinical meaningful since it equals the 1 month recommended interval a parent has before their child is considered late for a vaccination dose[48]—we need to enroll 160 parent/newborn pairs total, with 80 per arm and 10 at each of the 16 study clinics (assuming an α of 0.05 and an intraclass correlation coefficient for within-clinic correlation of 0.02).[49]

In our original calculation, we assumed 80% of GH parents would be reached, a conservative estimate of a 20% prevalence of GH parents who will have a positive PACV-SF, 10% of VHPs who fail to meet other study eligibility requirements, 25% of VHPs who do not agree to participate (unpublished data),[22] a 10% attrition rate over the course of the study, and 70% who remain continuous GH members,[34] resulting in the need to approach 2400 parents to reach our sample size goal. From 2010 – 2012, there was an average of 2679 GH births per year in the 5 Washington State counties from which we will recruit parents. Reaching our sample size goal should therefore be feasible given our designated 15 month recruitment period. However, we now know that the vaccine hesitancy rate at GH is about 5%. Therefore, we need to screen approximately 3500 parents to reach the desired sample size goals of 160.

For Aim 2, we will have 80% power with a sample size of 160 parents to detect a 17% increase in the proportion of parents who rate their visit highly, assuming a baseline proportion of 72%.[50] For Aim 3, we will have 80% power to detect a 14% pre-post difference in the proportion of providers who perceive time as a barrier to quality vaccine discussions between control (1% pre-post difference) and SPARCK arms (15% pre-post difference), assuming a baseline proportion of 62%[28] and 56 providers in each arm.

16.3. **Describe how missing data will be handled.** Missing data will be excluded from analysis.

16.4. **Describe plans for interim analysis and early stopping rules (if applicable).** N/A

16.5. **Describe under what circumstances will un-blinding occur and the procedures to do so (if applicable).** N/A

17. Safety and Adverse Event Management

Note: You may refer to the Data Safety Monitoring section in the application for your answers in this section if this is an initial LIP. If any of these plans is modified at some point in time after initial study approval, then the modifications should be described in this section as part of a subsequent LIP.

Safety and Adverse Event Monitoring

17.1. **Describe methods used to ensure participant safety monitoring. Include specific management plans for expected or unexpected adverse events as applicable.**
See Data Safety Monitoring section of application.

17.2. **If there are specific criteria for study drug/intervention, modification or discontinuation for adverse reactions, they should be described here.** N/A

Monitoring Plan

17.3. **Describe Monitoring Plan.**
See Data Safety Monitoring section of application.

Adverse Event Reporting

17.4. **Describe how adverse events will be defined, graded, and reported. If there are any potential adverse events that will not be considered related to the study, these should be described here.**
See Data Safety Monitoring section of application.

Investigator Help

Data Collection Procedures for Adverse Events

17.5. **Indicate who will be collecting and reviewing adverse events and with what frequency.**
See Data Safety Monitoring section of application.

Review of Study Conduct and Safety Data

17.6. **Describe who (individual or group) will periodically review the study conduct and data to assess safety for current or future participants. Include what data will be reviewed and the frequency of the review.**
Drs. Opel (PI), Henrikson (co-investigator) and Taylor (co-investigator) will monitor the progress of the trial through quarterly assessments of data quality and timeliness, participant recruitment, accrual and retention, participant risk versus benefit, and other factors that could affect study outcomes. We will make quarterly determinations regarding continuation or conclusion of the trial based on these assessments.

Investigator Help

18. Data/Specimen Sharing

18.1. **Discuss if data or samples will be shared with other investigators outside of the research team. Provide details as to when the data/samples will be shared (eg during trial, banked for future indefinite use), who will have access to the data/samples, how access will be controlled and whether data/samples will be coded or de-identified.** Data will not be shared outside the research team.

19. References

19.1. **Provide references.** List the various references cited in support of research plan.

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19.2. **Research Team's Previous Experience in Conducting This Type of Study.** Describe the previous experience of the Principal Investigator and/or study team in conducting this type of study. This can include unpublished and in-progress endeavors as well as published reports. Participation in studies which used a similar research design, but in a different setting/patient population may also be considered relevant. If the investigators have not participated in any preliminary studies leading up to the current one, please reply "None" to this question.

Dr. Opel has extensive experience using survey methods and qualitative analyses similar to that proposed in this project. This projects builds upon earlier Seattle Children's Research Institute-funded work that he conducted as PI to develop the Parent Attitudes about Childhood Vaccines (PACV) survey and evaluate its construct validity, predictive validity, and test-retest reliability. These foundational projects yielded 3 peer-reviewed publications and helped foster a strong collaborative relationship with investigators at Group Health Research Institute/Group Health Cooperative. To develop his overall research program, he successfully competed for NIH support through the K23 mechanism and has efficiently and effectively administered his K23-associated projects: he has

provided leadership and oversight to research staff, fostered research collaborations, and to date has published two manuscripts. This, in combination with his clinical and research training in general pediatrics and health services research, has provided him with the research environment, expertise and insight needed to successfully conduct and complete the proposed work. In summary, he is an early stage investigator with a productive research record and the relevant background and research skills needed to successfully lead and conduct the proposed research.