

AWARD NUMBER: W81XWH-21-1-0347

TITLE: Increasing HPV Vaccination Coverage Among Adolescent and Young Adult (AYA) Cancer Survivors: A Multilevel Intervention

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CONTRACTING ORGANIZATION: University of Minnesota

REPORT DATE: SEPTEMBER 2022

TYPE OF REPORT: Annual Report

PREPARED FOR: U.S. Army Medical Research and Development Command
Fort Detrick, Maryland 21702-5012

DISTRIBUTION STATEMENT: Approved for public release; distribution is unlimited.

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REPORT DOCUMENTATION PAGE		<i>Form Approved</i> <i>OMB No. 0704-0188</i>
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1. REPORT DATE SEPTEMBER 2022	2. REPORT TYPE Annual Report	3. DATES COVERED 08/15/2021-08/14/2022
Increasing HPV Vaccination Coverage Among Adolescent and Young Adult (AYA) Cancer Survivors: A Multilevel Intervention		5a. CONTRACT NUMBER
		5b. GRANT NUMBER W81XWH-21-1-0347
		5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S) Deanna Teoh, MD, MS E-Mail: dkteoh@umn.edu		5d. PROJECT NUMBER
		5e. TASK NUMBER
		5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) University of Minnesota Office of Sponsored Projects Administration 200 Oak Street SE #24 Minneapolis, MN 55455-2009		8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Medical Research and Development Command Fort Detrick, Maryland 21702-5012		10. SPONSOR/MONITOR'S ACRONYM(S)
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)
12. DISTRIBUTION / AVAILABILITY STATEMENT Approved for Public Release; Distribution Unlimited		

13. SUPPLEMENTARY NOTES**14. ABSTRACT**

Background: Adolescent and young adult (AYA) cancer survivors are 2.8 times more likely to develop a human papillomavirus (HPV)-associated cancer than the general population. Thus, 3 doses of HPV vaccine are recommended for AYA cancer survivors 9-26 years of age. Unfortunately, HPV vaccination coverage among AYA cancer survivors is lower than that in the general population.

Objective: This project seeks to increase HPV vaccination initiation and completion among AYA cancer survivors by implementing a single multilevel intervention focused on the clinic, oncologist, and survivor.

Specific Aims:

Aim 1: Test the efficacy of a multilevel intervention to increase HPV vaccination initiation among AYA cancer survivors.

Aim 2: Compare efficacy of the GLAm app versus clinic-generated reminders to increase completion of the HPV vaccination series among AYA cancer survivors independent of scheduled survivorship visits.

Study Design: The multilevel intervention comprising a quality improvement (QI) study combined with a randomized controlled trial (RCT) was developed using the *Fogg Behavior Model*. The QI study comprises training and encouragement for oncologist and survivorship clinic staff to recommend HPV vaccination to all unvaccinated/incompletely vaccinated patients. The RCT will randomize survivors of childhood cancer 18+ years of age or caregivers for survivors of childhood cancer 9-17 years of age to usual care (QI intervention alone) versus use of a game-based learning avatar-navigated mobile (GLAm) app to increase knowledge about HPV and HPV vaccination and to motivate initiation and completion of the 3-dose HPV vaccine series.

Progress to date: In the first year of the study, the QI study has been implemented, and initial data abstraction and survey of healthcare provider satisfaction with the intervention has been completed. Patient surveys to evaluate their impression of the QI intervention are being distributed on a rolling basis. The GLAm app revised content has been created, and the development team is in the final stages of updating the app in preparation for the RCT initiation in fall 2022.

Results: During the first 3 months of the QI intervention, 54 eligible patients presented to the childhood cancer survivorship clinic. Of those, 78.6% of patients received a recommendation for HPV vaccination. Initial oncologist (MD, NP) and staff surveys at 3 months showed that 100% agreed that the addition of the vaccination recommendation did not interrupt workflow or add significant time to charting or to the overall clinic visit. 100% were satisfied with the intervention.

Significance: After a single interactive training for oncology providers and staff, recommendation for HPV vaccination was high, and oncologists and staff were highly satisfied with the intervention and did not feel it interrupted the existing clinic workflow. Data collection are ongoing. Uptake of HPV vaccination will be measured in the future due to an anticipated lag between the recommendation and receipt of the vaccine, and a known 3-month lag between vaccination and reporting in the medical record from the state vaccination registry.

15. SUBJECT TERMS

HPV vaccination; Cancer prevention; Cancer survivorship; childhood cancer

16. SECURITY CLASSIFICATION OF:**17. LIMITATION OF ABSTRACT****18. NUMBER OF PAGES****19a. NAME OF RESPONSIBLE PERSON**

USAMRDC

a. REPORT**b. ABSTRACT****c. THIS PAGE**

Unclassified

24

19b. TELEPHONE NUMBER (include area code)

Unclassified

Unclassified

Unclassified

TABLE OF CONTENTS

	<u>Page</u>
1. Introduction	5
2. Keywords	5
3. Accomplishments	6
4. Impact	
5. Changes/Problems	9
6. Products	11
7. Participants & Other Collaborating Organizations	12
8. Special Reporting Requirements	14
9. Appendices	15

1. INTRODUCTION:

Survivors of childhood cancer are 2.8 times more likely to develop a secondary human papillomavirus (HPV)-associated cancer than the general population. Unfortunately, HPV vaccination coverage among survivors of childhood cancer is even lower than that in the general population. Further, due to concerns about reduced immunogenicity in the setting of previous immunosuppressive cancer therapy, 3 doses of the HPV vaccine are recommended for all survivors of childhood cancer regardless of age at initiation of vaccination. The purpose of this study is to increase HPV vaccination initiation and 3-dose completion among survivors of childhood cancer, defined as age 25 years of age or younger at cancer diagnosis. This study employs a multilevel approach, including a quality improvement intervention targeting the oncologists and clinic staff to routinely provide a strong recommendation for HPV vaccination. The study will also test the efficacy of a game-based learning avatar-navigated mobile (GLAm) app versus usual care at the patient/caregiver level to increase vaccination initiation and completion independent of the clinic visit in a randomized controlled clinical trial.

2. KEYWORDS:

HPV vaccination; survivorship; childhood cancer; cancer prevention; mobile health technology.

3. ACCOMPLISHMENTS:

What were the major goals of the project?

- 1) Obtain IRB/HRPO approval (months 1-6): HRPO approval obtained 1/31/22. Children's Minnesota approved all study documents 4/28/22. SMART IRB (UMN single site IRB) approval obtained 5/26/22. OHRO approval obtained 9/5/22.
- 2) Convert GLAm app to focus on HPV vaccination for survivors of childhood cancer (months 1-8): 90% complete. Educational modules, app update mock-ups, app videos and infographics submitted to the app developers. Per communication with the app development team 9/1/22, the app revisions have been coded and are undergoing final review by the development team before review by the study team.
- 3) Conduct a RCT to determine the effect of the GLAm app to increase HPV vaccination among survivors of childhood cancer (months 8-35): Delayed due to delay in app revisions. The IRB is also requiring that we store the app on a server approved by the IRB due to concerns about HIPAA compliance (note: the app development group creates HIPAA-compliant apps for non-research clinical use, but the IRB has required that we move the app to a different server).
- 4) Conduct QI study to determine the effect of a strong oncologist recommendation for HPV vaccination & EHR reminders to increase HPV vaccination (months 1-42): EHR alert programming in progress (10%). The EHR alert programming has been stalled due to loss of staff and de-prioritization of HPV vaccination alerts at the health system level. Oncologist and staff training completed (UMN 3/3/22, Children's Minnesota 3/9/22). QI study initiated at UMN CCSP clinic 5/2/22. QI study initiated at Children's Minnesota 6/15/22. Data abstraction from the medical record is ongoing. The first quarter oncologist/staff surveys to assess satisfaction with the QI intervention and impact on workflow was sent 7/22/22 and have been completed. The first set of patient surveys to assess impression of HPV vaccination recommendation, intention to vaccinate, and barriers to vaccination were sent 8/22/22, with surveys sent to patients on a rolling basis based on the date of their clinic visit.
- 5) Conduct QI study to measure the effect of sending EHR-generated reminders to patients for dose 2,3 of the HPV vaccine: EHR-generated reminders being programmed (10%). Delays in the EHR reminders has been delayed due to IT staff shortages and de-prioritization of HPV vaccination reminders at the health system level.
- 6) Conduct a RCT to determine the effect of GLAm app-generated reminders to complet the HPV vaccination series: GLAm app re-design in progress (90%). Initiation of the RCT delayed due to the delay in completion of the GLAm app revisions.

What was accomplished under these goals?

- 1) Obtain regulatory approval: HRPO approval obtained. Children's Minnesota (study site) IRB approved the protocol and study documents. SMART IRB (University of Minnesota single-site IRB) approval obtained. OHRO approval obtained.
- 2) Conversion of GLAm app to focus on HPV vaccination among survivors of childhood cancer: App content revisions reviewed, revised and approved by the study Advisory Panel. Revisions spreadsheet submitted to and reviewed by app developers. All app videos created and edited, and videos have been reviewed and approved by the Advisory Panel. Videos and infographics for the app submitted to the app developers (appendix 1). App conversion delayed due to loss of staff in Education Technology Innovations (app development team). Per communication with the app development team 9/1/22, the app revisions have been coded and are under final review by the app development team prior to releasing for review by the study team.
- 3) QI study initiated: Training for oncology providers and staff completed. QI clinic procedures implemented 5/2/22 at UMN CCSP clinic. QI intervention implemented at Children's Minnesota LTFU clinic 6/15/22. Medical record data abstraction initiated and ongoing. Quarter 1 oncologist and staff surveys to assess satisfaction with the QI intervention and impact on workflow were completed, with 100% agreeing or strongly agreeing that they received adequate training in how to recommend the vaccine and how to respond to questions or concerns (training), and 100% agreeing or strongly agreeing that recommending HPV vaccination and documentation of the recommendation does not add significant time to the clinic visit or interrupt the clinic workflow (Appendix 2).
- 4) EHR reminders stalled: Proposal previously reviewed and discussed with the Health Informatics team. Plan for integration of proposal with the current best practice EHR changes in development for the primary care clinics tailored for implementation in the Childhood Cancer Survivorship Program Clinic. The IT staff leading this project left the University, and this project has been de-prioritized at the health system level.
- 5) Conduct RCT to determine the effect of the GLAm app to increase HPV vaccination initiation among survivors of childhood cancer: Initiation of the RCT is delayed due to delays the app conversion. Plan to initiate the RCT fall 2022.

What opportunities for training and professional development has the project provided?

Nothing to report

How were the results disseminated to communities of interest?

Nothing to report.

What do you plan to do during the next reporting period to accomplish the goals?

2) Conversion of GLAm app to focus on HPV vaccination among survivors of childhood cancer: The PI has been in frequent communication with the app development team to ensure progress on the app revisions, and to reinforce the planned RCT initiation date. Once the app is made available to the study team, it will be reviewed by the study team as well as the Advisory Panel for feedback, and final revisions will be made. We anticipate there may be further delays for full functionality of the app due to the need to store the code on the IRB-approved server. We have a work-around plan, in which a preliminary version of the app will be used with omission of the collection of any protected health information (use of the app on using the current server has been approved by the IRB provided no protected health information is collected by the app), with collection of protected health information through a survey administered separate from the app. Text message reminders for vaccination will be sent by the study coordinator (the study team has an encrypted iPad for research use, and all study participants will provide written informed consent to be contacted by text message); this will be transitioned to automated app-generated text messages once the code is stored on the IRB-approved server.

3) QI study assessment: Medical record data abstraction will continue to determine the proportion of eligible patients who have received a recommendation for HPV vaccination, and vaccination uptake. We anticipate a 3-month delay for state immunization registry data to be uploaded to the electronic health record, and will review immunization records on an ongoing basis. Surveys will be sent on a rolling basis to patients meeting criteria for inclusion in the QI intervention to assess impression of HPV vaccination recommendation, vaccination intention and uptake, as well as to collect additional data on barriers to vaccination. We will continue quarterly survey assessment of oncologists and staff to assess satisfaction with the intervention and impact on workflow until 1 year after initiation (spring 2023). The intervention will be revised based on feedback.

4) EHR reminders: The PI and co-I Dr. Melton-Meaux will continue to work with the IT team to encourage programming of the EHR HPV vaccination reminders at least in the survivorship clinic. However, if this is not feasible then this component of the intervention may have to be omitted.

5) Conduct RCT to determine the effect of the GLAm app to increase HPV vaccination initiation among survivors of childhood cancer: We anticipate opening the RCT to enrollment fall 2022. We have designed all of the follow-up surveys in REDCap, and are prepared to open when the app is ready.

4. IMPACT:

What was the impact on the development of the principal discipline(s) of the project?

A simple 1-hour virtual training increased awareness of HPV-associated cancers and the importance of HPV vaccination among oncologists and clinic staff. Prior to the implementation of the QI intervention, our oncologists and staff were not recommending vaccination. With 1 training session almost 80% of patients have received a vaccination recommendation in the first 3 months, and we anticipate this proportion to increase with time as it becomes a regular part of survivorship care.

What was the impact on other disciplines?

Nothing to report.

What was the impact on technology transfer?

Nothing to report.

What was the impact on society beyond science and technology?

Nothing to report

5. CHANGES/PROBLEMS:

Changes in approach and reasons for change

The QI intervention was initiated without EHR vaccination reminders due to staff shortages and de-prioritization of EHR HPV vaccination reminders at the health system level. The EHR reminders were never intended for the Children's Minnesota clinic, and thus only impact the study design at the University of Minnesota. We are still working to trying to implement this portion of the intervention, but anticipate it may have less of an effect as our oncologists and staff have integrating immunization review and recommendation for patients into their workflow independent of an EHR reminder.

Actual or anticipated problems or delays and actions or plans to resolve them

Delay in the GLAM app revisions: We are working with the app development team to complete the revisions with a RCT enrollment initiation of fall 2022. We anticipate further delays due to the need to store the app code on a different IRB-approved server, but have planned a work-around which in which all protected health information will be collected outside the app in an IRB-approved manner until we are able to collect the information directly through the app.

Delay in EHR reminder programming: We are working with the IT team to program the reminders just for the survivorship clinic since the health system has de-prioritized HPV vaccination reminders system-wide. However, if we are unable to resolve this, we may need to omit the EHR reminders from the QI intervention. We do not anticipate that this will significantly affect the intervention as HPV vaccination recommendations for eligible patients has been high in the first quarter even without any EHR reminders.

Changes that had a significant impact on expenditures

The initial award was for a study which was to be conducted at a single site. However, due to changes in clinic volume due to the COVID pandemic, we added Children's Minnesota as a second study site under a subaward. The budget was revised and has been approved by the DOD.

There was a delay in hiring a research coordinator, thus budgeted costs for the first 9 months were not spent. We had to revise our posting and hired a research coordinator with less experience than initially planned, thus the salary for the research coordinator is decreased compared to the original estimate.

Significant changes in use or care of human subjects, vertebrate animals, biohazards, and/or select agents**Significant changes in use or care of human subjects**

Nothing to report

Significant changes in use or care of vertebrate animals

Not applicable.

Significant changes in use of biohazards and/or select agents

Not applicable.

6. PRODUCTS

- **Publications, conference papers, and presentations**

Report only the major publication(s) resulting from the work under this award.

Journal publications. *List peer-reviewed articles or papers appearing in scientific, technical, or professional journals. Identify for each publication: Author(s); title; journal; volume: year; page numbers; status of publication (published; accepted, awaiting publication; submitted, under review; other); acknowledgement of federal support (yes/no).*

Nothing to report.

Books or other non-periodical, one-time publications. *Report any book, monograph, dissertation, abstract, or the like published as or in a separate publication, rather than a periodical or series. Include any significant publication in the proceedings of a one-time conference or in the report of a one-time study, commission, or the like. Identify for each one-time publication: author(s); title; editor; title of collection, if applicable; bibliographic information; year; type of publication (e.g., book, thesis or dissertation); status of publication (published; accepted, awaiting publication; submitted, under review; other); acknowledgement of federal support (yes/no).*

Nothing to report.

Other publications, conference papers and presentations.

Poster presentation: Anja Dulin. Quality improvement intervention: HPV vaccination in childhood cancer survivors. M-ASCEND symposium. University of Minnesota, Minneapolis, MN. August 11, 2022.

- **Website(s) or other Internet site(s)**

List the URL for any Internet site(s) that disseminates the results of the research activities. A short description of each site should be provided. It is not necessary to include the publications already specified above in this section.

Not applicable.

- **Technologies or techniques**

Identify technologies or techniques that resulted from the research activities. Describe the technologies or techniques were shared.

Not applicable.

- **Inventions, patent applications, and/or licenses**

Identify inventions, patent applications with date, and/or licenses that have resulted from the research. Submission of this information as part of an interim research performance progress report is not a substitute for any other invention reporting required under the terms and conditions of an award.

Not applicable.

- **Other Products**

GLAm app: A game-based learning avatar-navigated mobile app which provides education about HPV and HPV vaccination in a fun learning environment. The app also has links to additional education resources, reminders for HPV vaccination, and links to help users identify locations where then can get vaccinated.

7. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS

What individuals have worked on the project?

Name: Deanna Teoh

Project Role: PI

Researcher Identifier: 0000-0002-1931-1445

Nearest person month worked: 2.4

Contribution to project: Regulatory approvals; Oversight of app development; Oversight of survey development/revisions; Oversight of QI project implementation

Name: Karim Sadak

Project Role: Co-I

Researcher Identifier: 0000-0002-4511-5456

Nearest person month worked: 1.2

Contribution to project: Contributed to app revisions; Implementation of QI project

Name: Rachel Vogel

Project Role: co-I

Researcher Identifier: 0000-0003-0149-8464

Nearest person month worked: 1

Contribution to project: Protocol revisions

Name: Helen Parsons

Project Role: co-I

Researcher Identifier: 0000-0003-3822-9858

Nearest person month worked: 1.2

Contribution to project: Protocol revisions; Design of QI implementation

Name: Katharine Lange

Project Role: Children's Minnesota site PI

Researcher Identifier: NA

Nearest person month worked: 1

Contribution to project: Implementation of QI project

Name: Andrea Iverson

Project Role: Children's Minnesota Research Coordinator

Researcher Identifier: NA

Nearest person month worked: 1.2

Contribution to project: Regulatory approval at Children's Minnesota; Implementation of QI project

Name: Lindsey Wanberg

Project Role: Student research assistant (volunteer)

Researcher Identifier: 0000-0002-6052-5613

Nearest person month worked: 1.2

Contribution to project: App revisions; video creation and editing; project management

Name: Rida Shaikh

Project Role: Student research assistant (volunteer)

Researcher Identifier: NA

Nearest person month worked: 1

Contribution to project: App revisions; App infographic creation; Survey development & revisions.

Anja Dulin

Project Role: Student research assistant (funded externally through the M-ASCEND summer internship)

Research Identifier: NA

Nearest person month worked: 1.5

*All other research personnel contributed <1 person-month

Has there been a change in the active other support of the PD/PI(s) or senior/key personnel since the last reporting period?

Nothing to report.

What other organizations were involved as partners?

M-ASCEND

University of Minnesota, Minneapolis, MN

Support: M-ASCEND (Advancing Science, Enhancing Diversity) is a summer internship funded by the Masonic Cancer Center which supports undergraduate students from underrepresented minorities to participate in cancer research during the summer. Anja Dulin was my M-ASCEND mentee, and she was funded by the program to work 30 hours/week on the research project for a total of 2 months.

8. SPECIAL REPORTING REQUIREMENTS

COLLABORATIVE AWARDS: Not applicable

QUAD CHARTS: Not applicable

9. APPENDICES:

Appendix 1: Oncologist and staff QI feedback survey results

Appendix 2: Oncologist and staff QI survey

Appendix 3: Patient post-clinic visit QI survey

Appendix 4: Poster presentation for M-ASCEND symposium

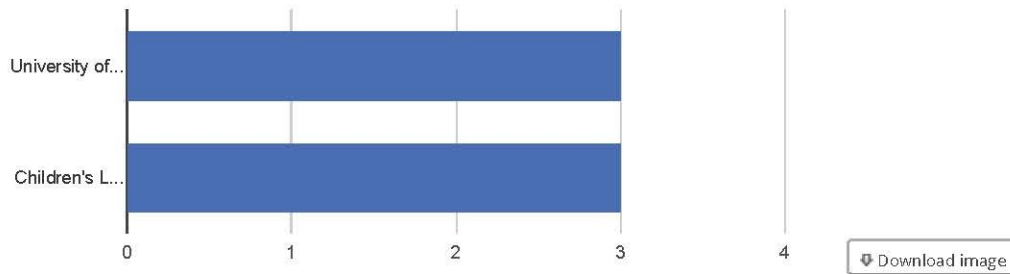
Data Exports, Reports, and Stats

Number of results returned: 6

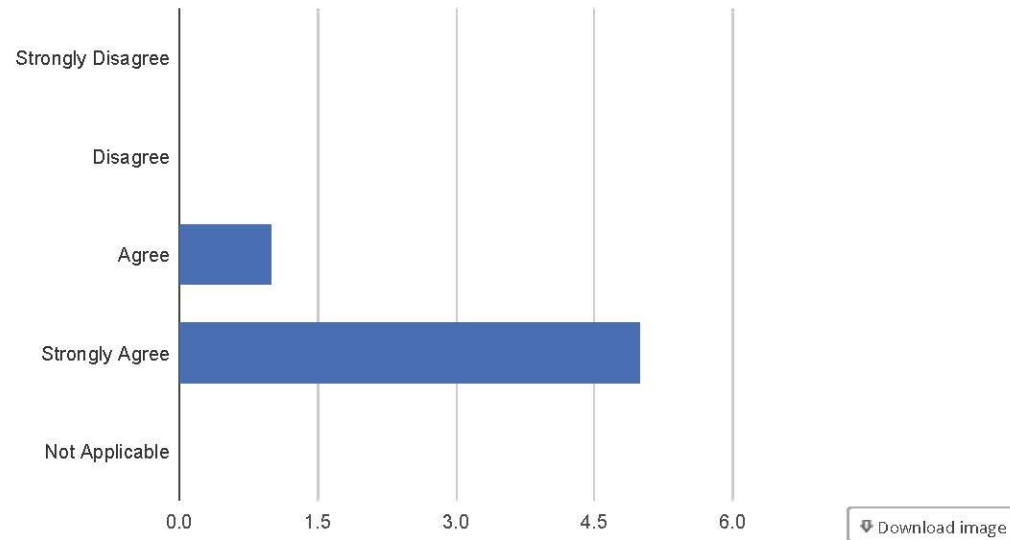
Total number of records queried: 6

All data (all records and fields)

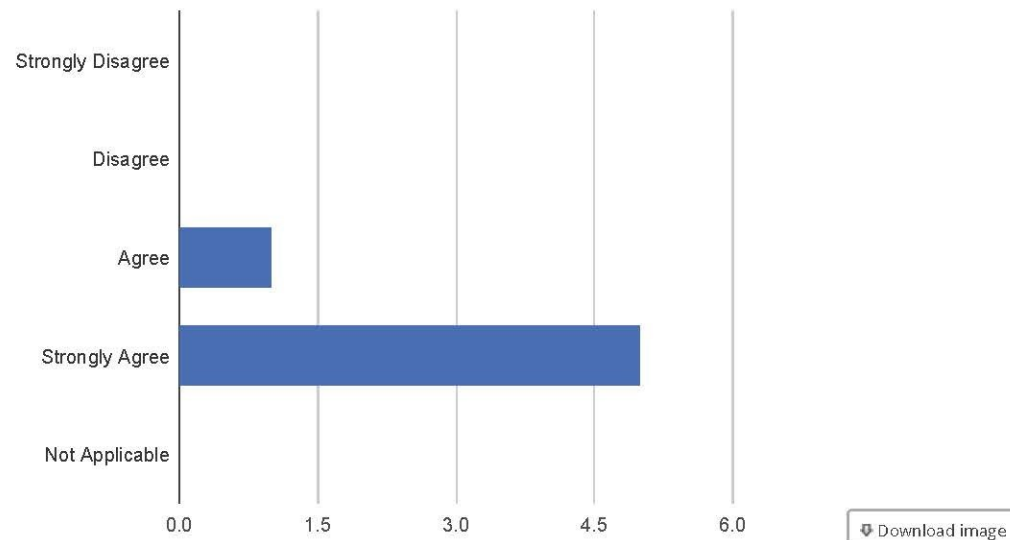
Clinic Site *(clinic_site)*



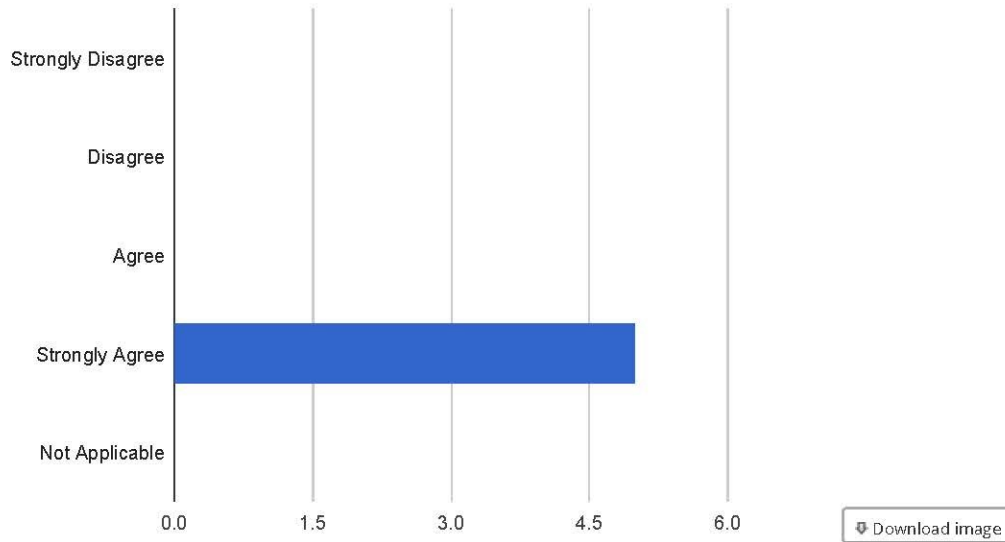
I received adequate training on how I can support HPV vaccination based on my role in the clinic *(support_vacc)*



I received adequate training on how to make a presumptive and strong recommendation for HPV vaccination *(make_recommendation)*

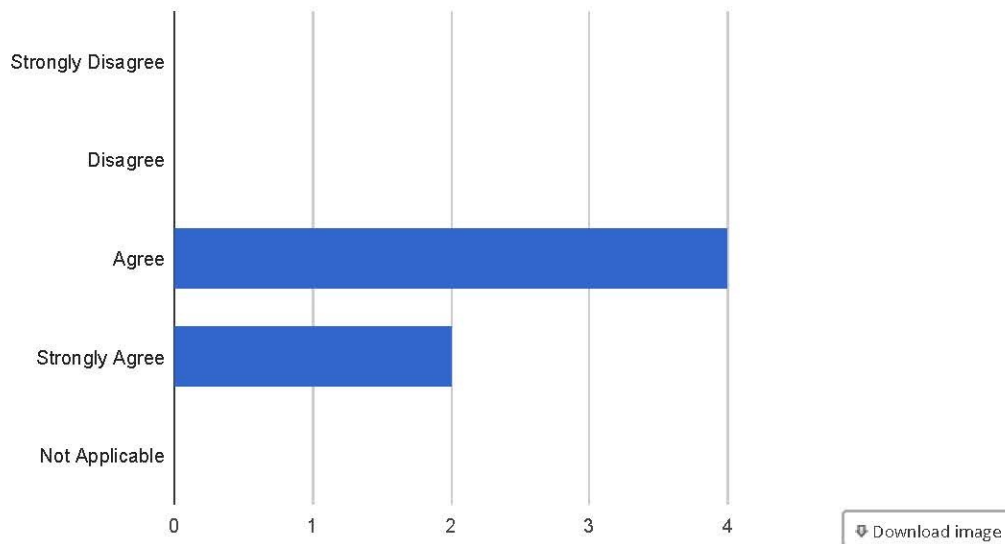


I received adequate training for how to respond to questions or concerns of the vaccine hesitant patient and/or caregiver *(respond_questions)*

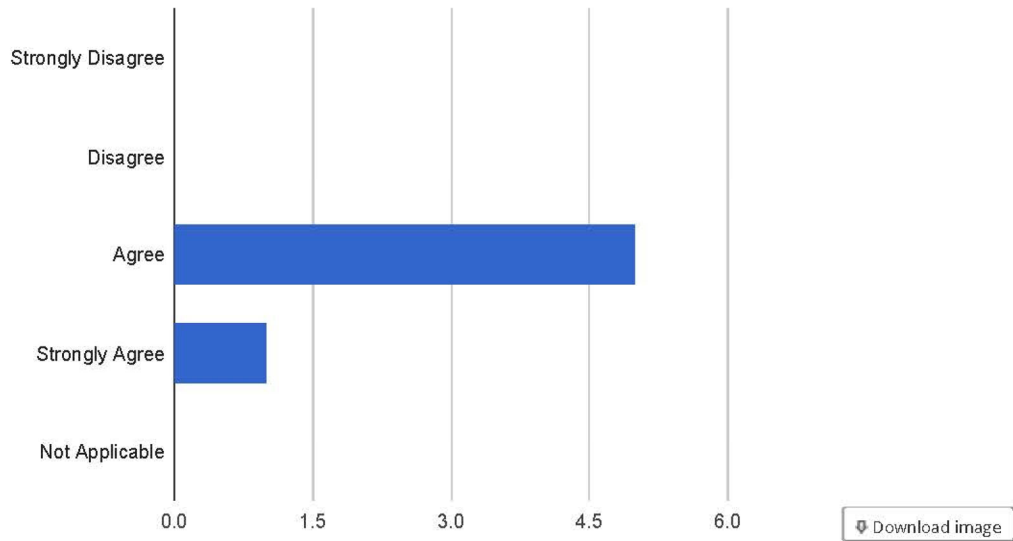


Additional Comments: *(additional_training_comments)*

Recommending HPV vaccination does not add significant time to the clinic visit *(recc_not_add_clinic_time)*

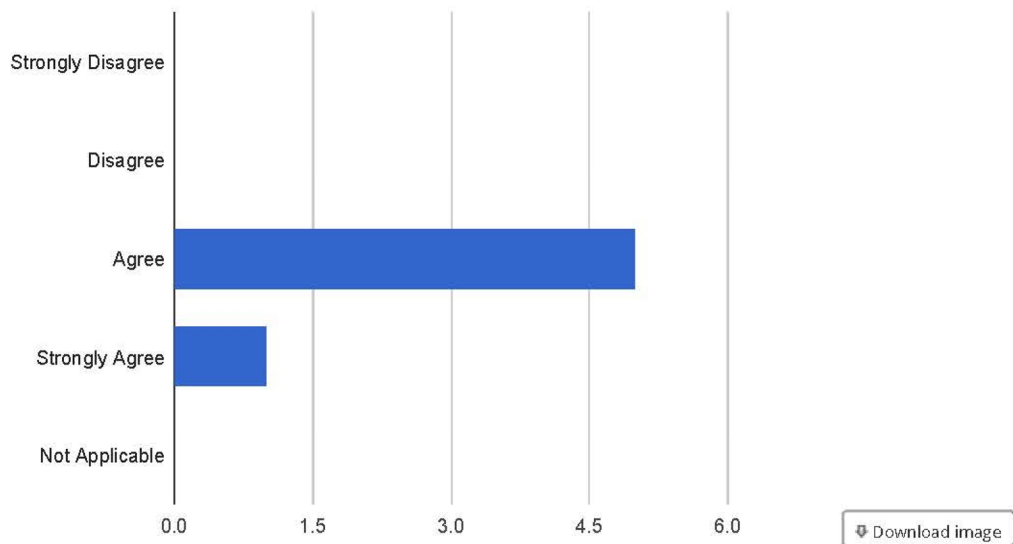


Recommending HPV vaccination does not interrupt the clinic workflow *(recc_not_interrupt)*



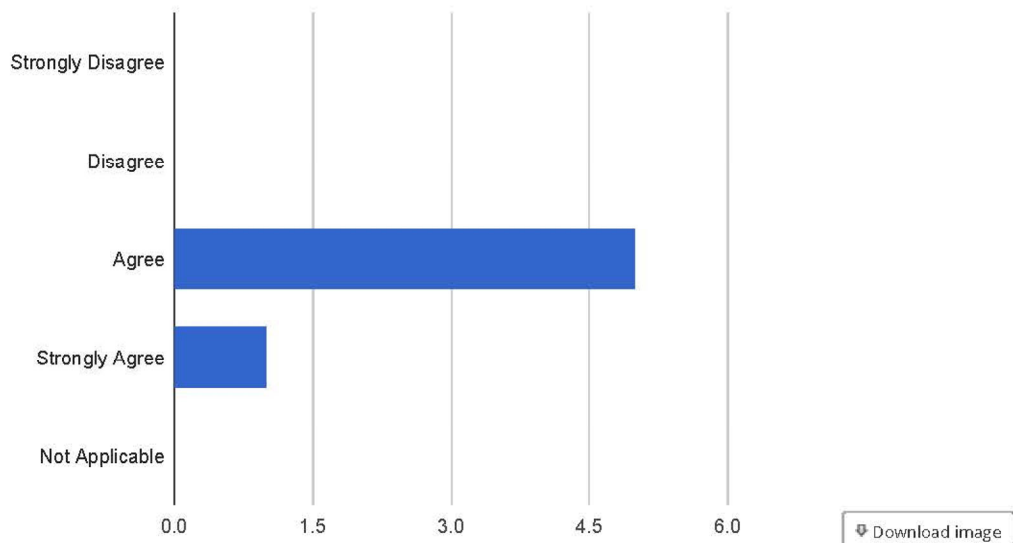
Documenting HPV recommendation does not add significant time to my charting

(recc_not_add_chart_time)



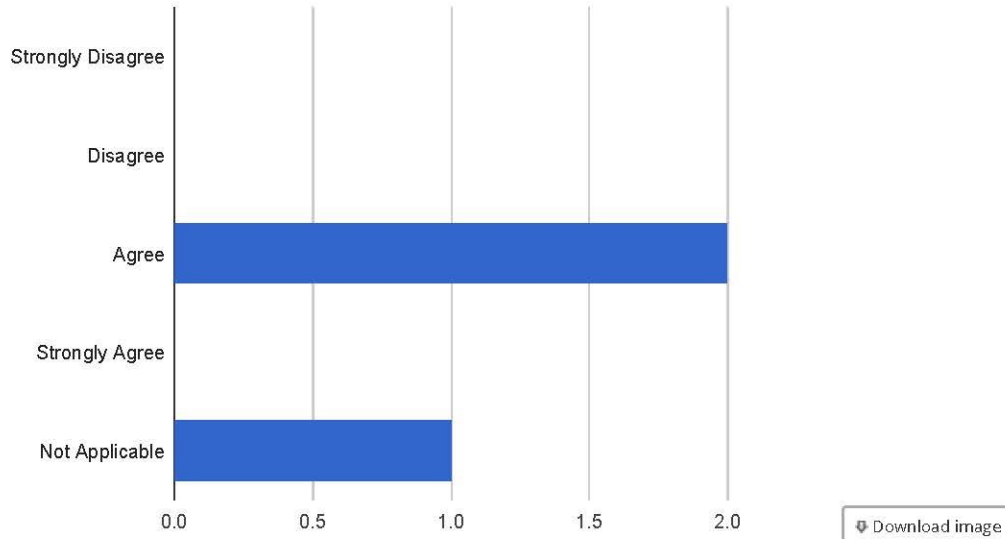
Documenting HPV recommendation does not interrupt the clinic workflow

(recc_not_interrupt_workflow)

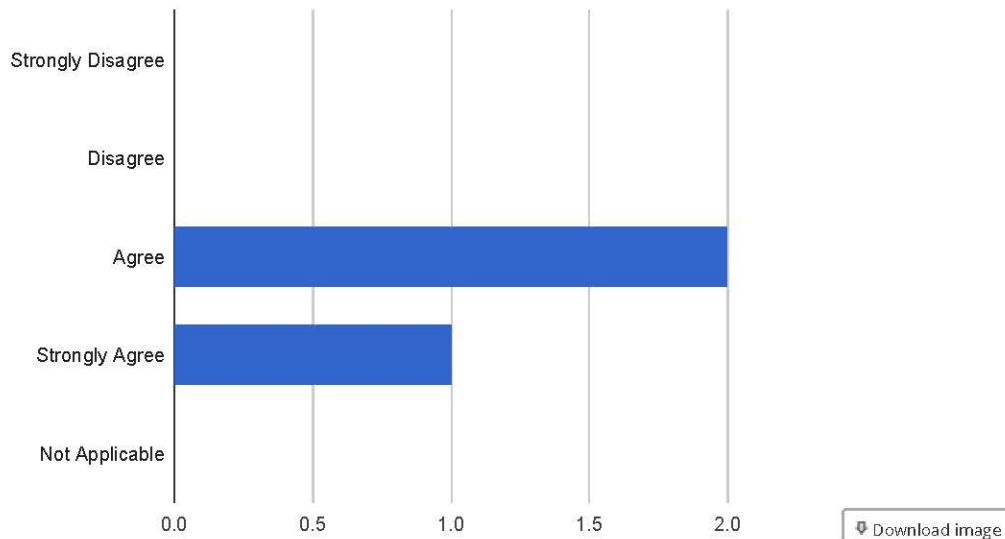


Additional Comments *(workflow_comments)*

It is easy to get the HPV vaccine for administration in clinic *(easy_to_get)*

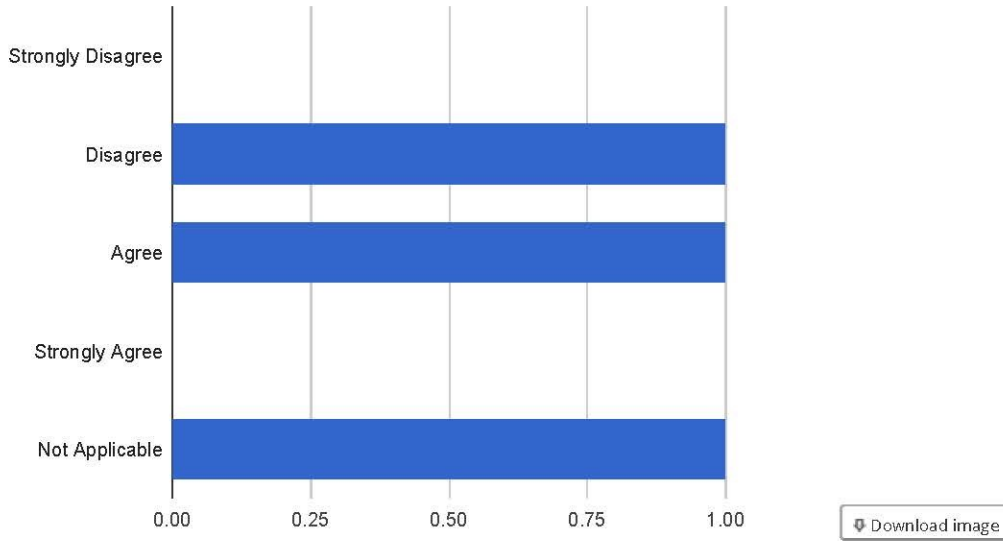


We have the staff to administer the HPV vaccine in clinic *(staff_to_administer)*



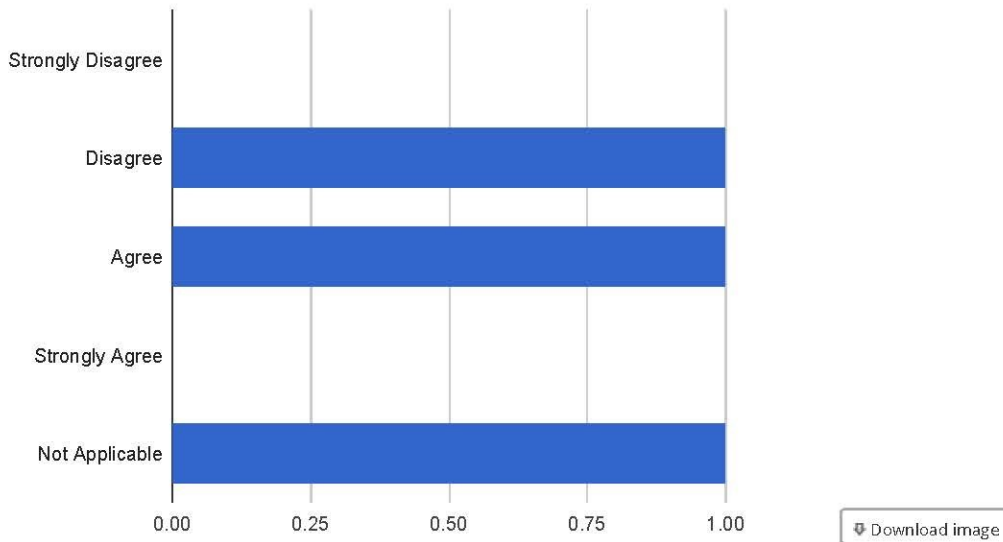
Administering the HPV vaccine in clinic does not add significant time to the visit

(administer_not_add_time)



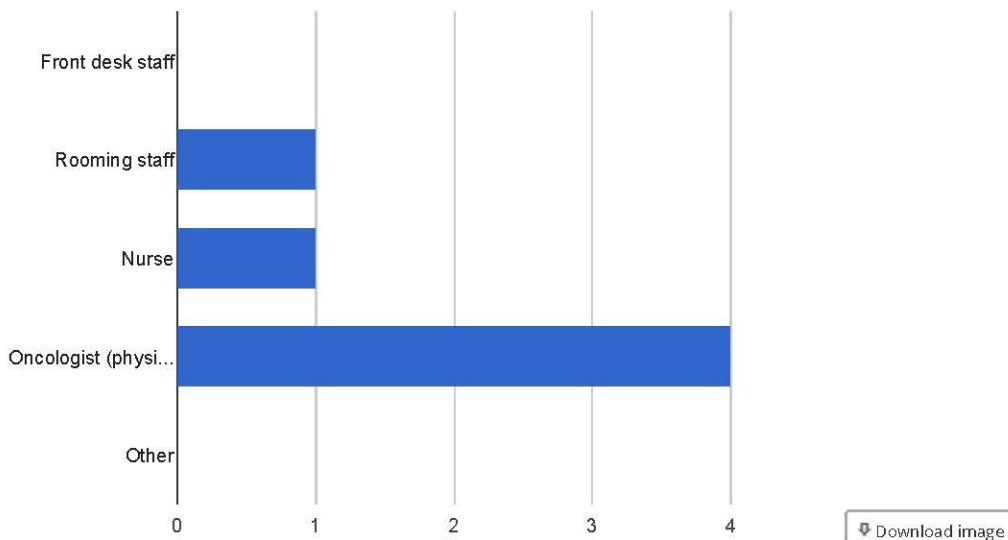
Administering the HPV vaccine in clinic does not interrupt the clinic workflow

(administer_not_interrupt_work)



Additional Comments *(hpvv_comments)*

Your role in the clinic: *(clinic_role)*



HPV Workflow Survey

Based on your experience with the HPV vaccination quality improvement initiative, please indicate the extent to which you agree or disagree with the following statements.

HPV Vaccination Workflow Survey

Clinic Site

- University of Minnesota CCSP
- Children's LTFU

Based on your experience with the HPV vaccination quality improvement initiative, please indicate the extent to which you agree or disagree with the following statements.

Training

	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Applicable
I received adequate training on how I can support HPV vaccination based on my role in the clinic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I received adequate training on how to make a presumptive and strong recommendation for HPV vaccination	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I received adequate training for how to respond to questions or concerns of the vaccine hesitant patient and/or caregiver	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Additional Comments:

Workflow

	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Applicable
Recommending HPV vaccination does not add significant time to the clinic visit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recommending HPV vaccination does not interrupt the clinic workflow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Documenting HPV recommendation does not add significant time to my charting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Documenting HPV recommendation does not interrupt the clinic workflow

Additional Comments

Administering HPV Vaccine in Clinic

	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Applicable
It is easy to get the HPV vaccine for administration in clinic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We have the staff to administer the HPV vaccine in clinic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Administering the HPV vaccine in clinic does not add significant time to the visit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Administering the HPV vaccine in clinic does not interrupt the clinic workflow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Additional Comments

Staff Information

Your role in the clinic:

- Front desk staff
- Rooming staff
- Nurse
- Oncologist (physician or advanced practice provider)
- Other

Clinic role

Post Visit Survey

Please complete the survey below.

Thank you!

Please enter your Study ID number (this is the five digit number provided in your email): _____

Please confirm your Study ID number: _____

The Study ID numbers do not match

choice

HPV vaccination recommendation: Based on your experience during your last Childhood Cancer Survivorship Program (CCSP) clinic visit, please indicate the extent to which you agree or disagree with the following statements.

	Strongly Disagree	Disagree	Agree	Strongly Agree	I Don't Know	Not applicable
My (my child's) clinic staff (front desk staff; rooming staff; nurse) strongly recommended HPV vaccination	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My (my child's) oncologist (physician, nurse practitioner or physician's assistant) strongly recommended HPV vaccination	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My (my child's) oncologist explained the reasons HPV vaccination is recommended	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was satisfied with my (my child's) oncologist's answers to my questions and concerns about the HPV vaccine	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Additional Comments: _____

Choose the option which best applies to you:

- I (my child) has subsequently received the HPV vaccine
- I (my child) has not yet received the HPV vaccine, but I plan to vaccinate
- I (my child) will not receive the HPV vaccine

Where did you (your child) receive the HPV vaccination? (write clinic/pharmacy name) _____

Where will you (your child) receive the HPV vaccination? (write clinic/pharmacy name)

If are have received or are planning to receive the HPV vaccine outside of Minnesota, can we access your medical records? If yes, please complete the Release of Information Form link that will appear after you select "Yes".

- Yes (please complete Release of Information Form, link will appear after you click Yes)
- No
- N/a--I (my child) has/will receive the vaccine in Minnesota

Release of Information Form

What are your reasons for not vaccinating against HPV? (check all that apply)

- I do not have enough information
- The HPV vaccine is not effective
- There are not enough data on efficacy of the HPV vaccine in cancer survivors
- The vaccine is not safe for me (my child)
- There is not enough data on safety of the HPV vaccine in cancer survivors
- I (my child) do not like shots
- I (my child) do not receive vaccinations of any type
- I (my child) is not at risk of HPV infection
- I (my child) can prevent HPV infection without vaccination
- I (my child) has already been infected with HPV
- I (my child) does not have enough time to get the HPV vaccine
- I (my child) does not have insurance coverage for the HPV vaccine
- I (my child) cannot afford the HPV vaccine
- 3 shots is too much for a vaccine
- I do not know where I (my child) can get the vaccine (first dose and/or second, third doses)
- I (my child) do not have transportation to get the vaccine
- I (my child) cannot receive the HPV vaccine due to a health condition
- Other

Please list health conditions/contraindications to HPV vaccination:

If selected "Other" please clarify:

Additional Comments:

Quality Improvement Intervention: HPV Vaccinations in Childhood Cancer Survivors

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BACKGROUND

- Childhood cancer survivors (CCS): 2.8x more likely to develop secondary human papillomavirus (HPV)-related malignancies¹

United States: low HPV vaccine coverage

- 66% of adolescents initiating, and 49% completing the series.³
- For CCS, only 24% (34% among females, 17% among males).^{4, 5}

Barriers for HPV Vaccination

- Age ineligibility due to treatment times⁴
- Ineffective oncology to provider care transition⁶

Caregivers reported greater vaccination intent if they received sufficient safety information and timeline⁶

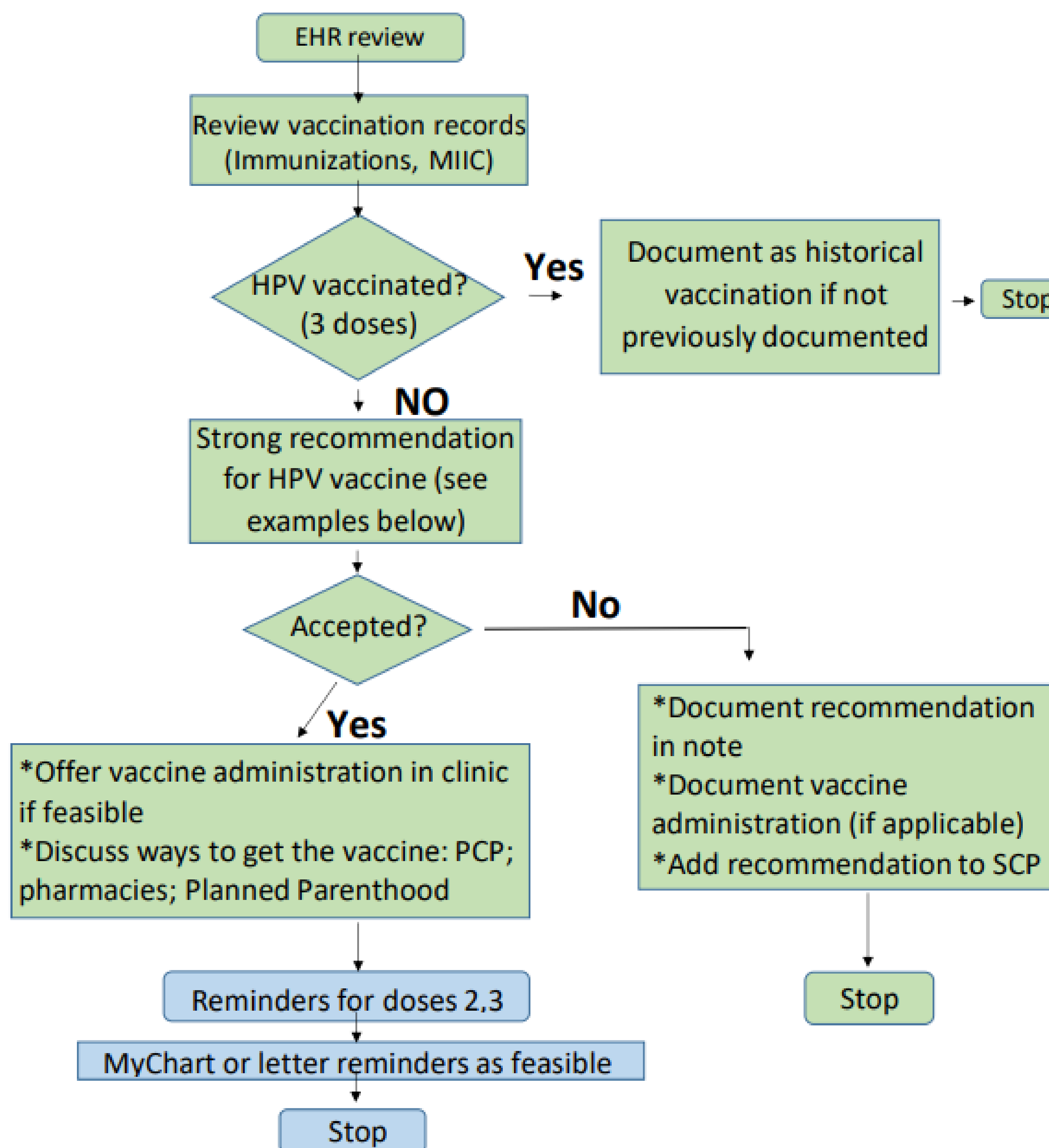
OBJECTIVES AND METHODS

Objective: Assessment of a quality improvement (QI) intervention to increase HPV vaccination among survivors of childhood cancer

Methods:

- Medical record review for eligibility
- REDCap Database – Chart abstraction
- Patient and Provider/Staff Surveys

WORKFLOW MODEL



FUTURE DIRECTIONS

Randomized controlled trial (RCT)

- Game-based learning mobile app (GLAm App)
- Increase HPV awareness
- Accessible vaccine-administration locations



Figure 1. GLAm screenshots with proposed topics for the AYA cancer survivor app version.

Continual chart abstraction and surveys to document progress

ACKNOWLEDGEMENTS

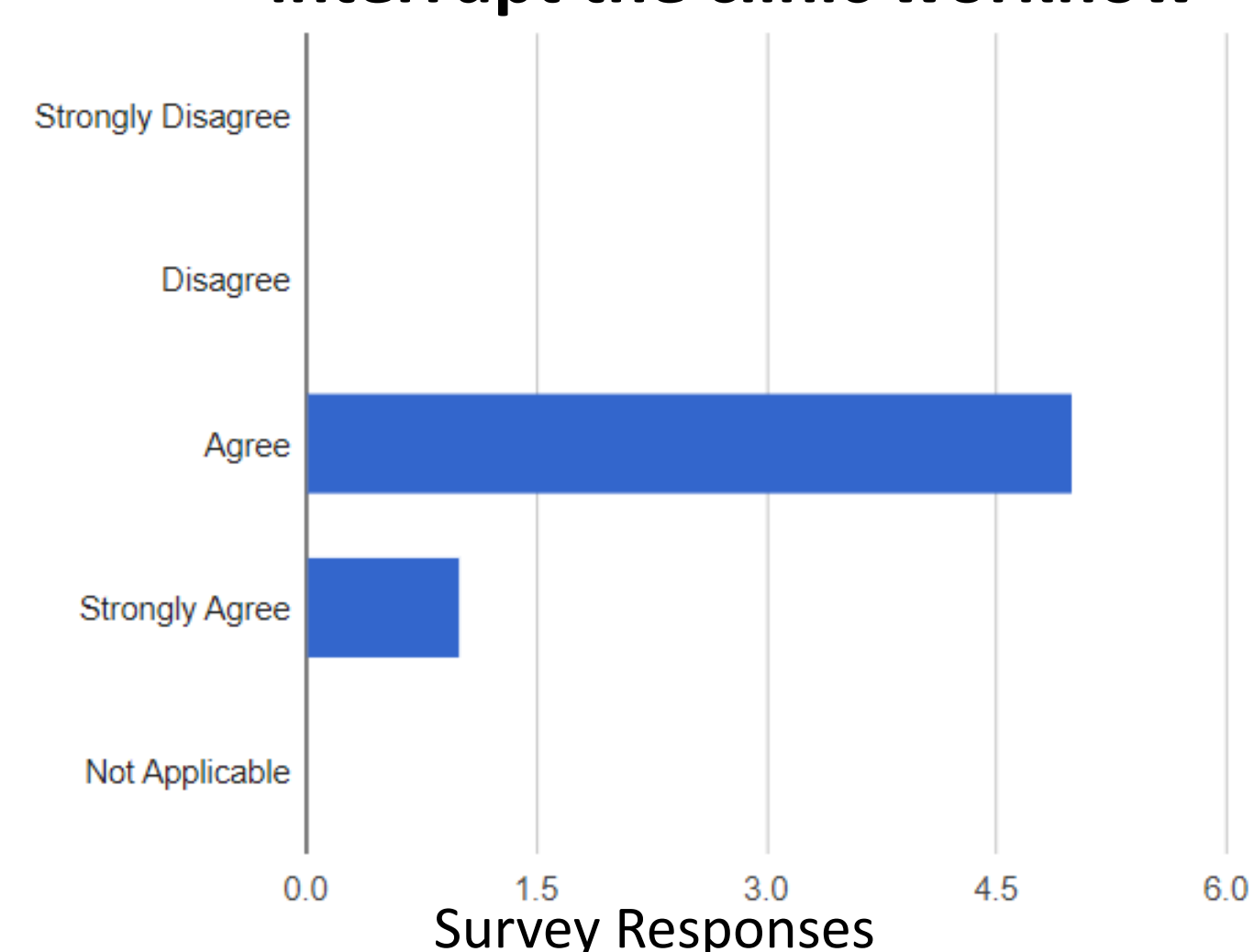
- I would primarily like to thank Dr. Teoh for mentorship and guidance throughout the research process.
- I also express my gratitude towards Dr. Rodolfo Batres and Dr. Susan Eversole for their continual support during the program.
- This research is generously supported by the National Cancer Institute of the NIH under Award Number R25CA250987.

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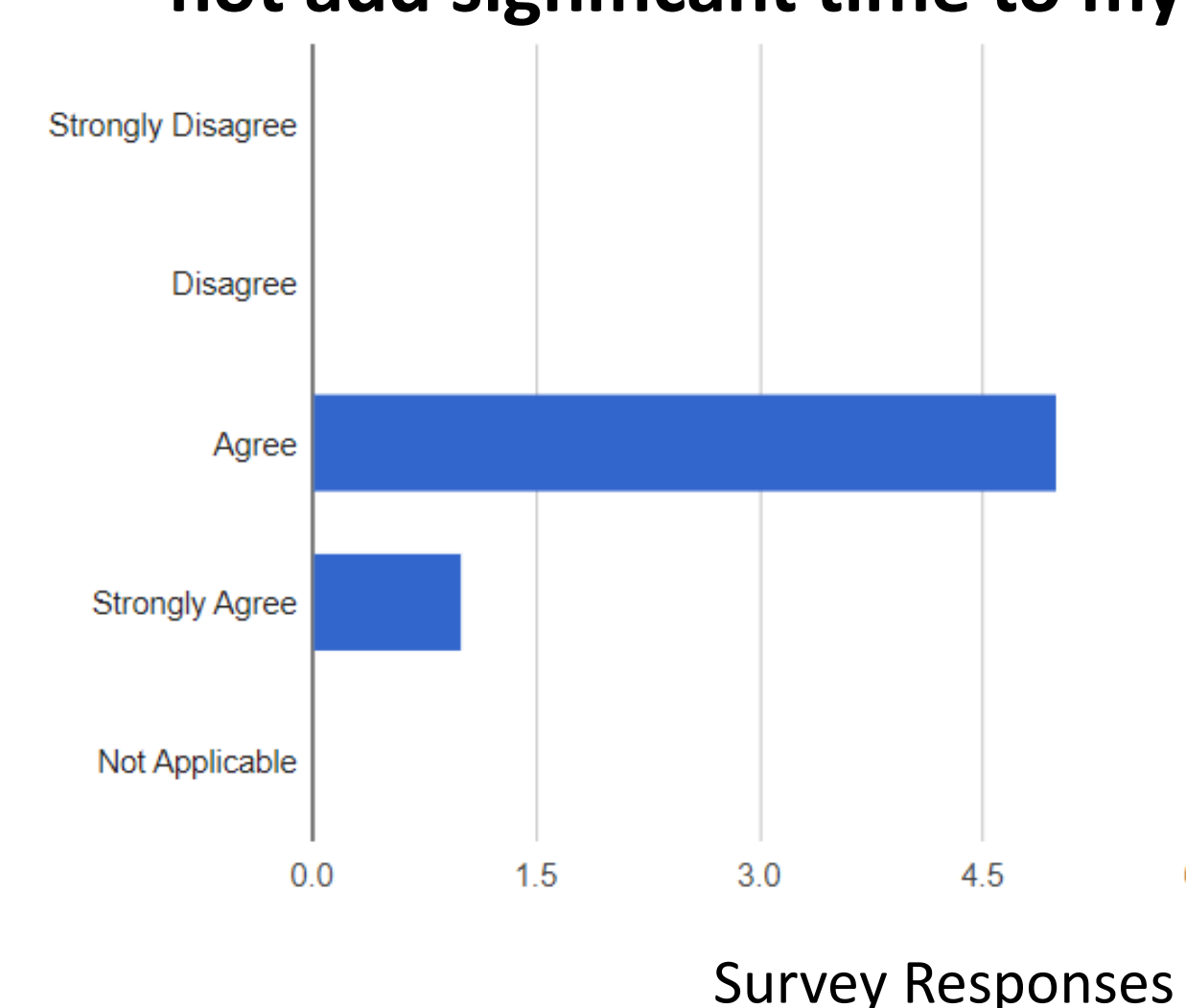
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INITIAL STAFF PROVIDER SURVEYS

Recommending HPV vaccination does not interrupt the clinic workflow



Documenting HPV recommendation does not add significant time to my charting



- 100% agreed **recommending** and **documenting** didn't interrupt workflow or add significant time to charting or the clinic visit.
- Of 54 eligible patients presenting to the clinic during that time, 78.6% received an HPV vaccination recommendation.