

# Evaluating the impact of reminder recall via phone calls and MyChart messaging on HPV vaccine completion rates at Westside Pediatric Clinic

Jessica Jarrell, MS4

MSA Mentor: Jessica Jack, MD

University of Colorado and Denver Health



## Abstract

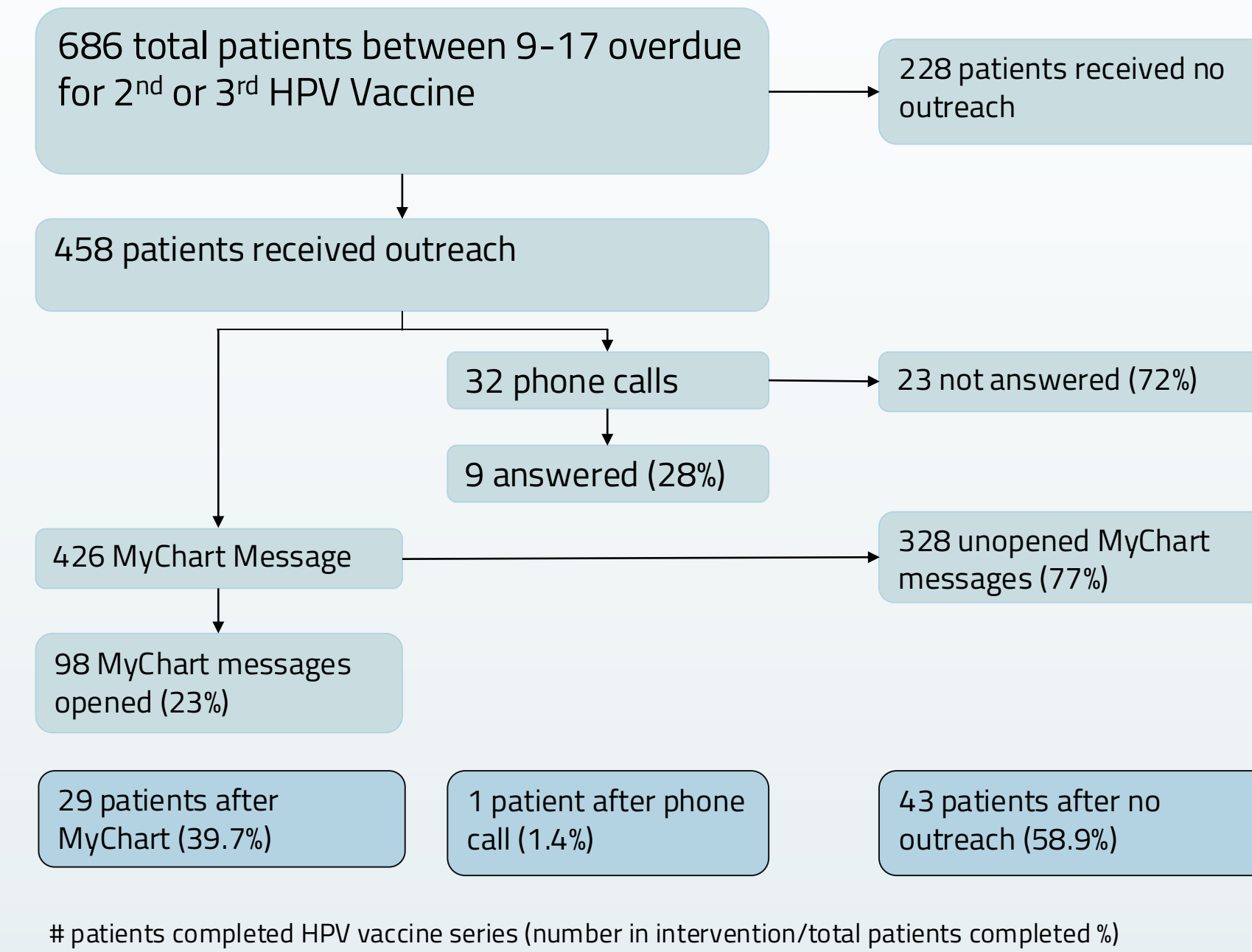
Human papillomavirus (HPV) is the most common sexually transmitted infection in the United States and a leading cause of preventable cancers. Although the 9-valent HPV vaccine is highly effective, vaccination rates remain below the Healthy People 2030 goal of 80%, with greatest benefit seen when initiated at younger ages. Denver Health has achieved high overall HPV vaccine completion, but timely follow-up doses remain a challenge. This quality improvement project evaluated a one-month reminder-recall pilot (October 2025) at Westside Pediatrics targeting patients aged 9–17 years overdue for dose two or three. Among 686 eligible patients, 458 (66.8%) received outreach via MyChart or phone. Engagement was low (23% message open, 28.1% call answered). Completion occurred in 39.7% of patients who opened messages and 11.1% who answered calls, while 58.9% without engagement or outreach completed vaccination independently. Completion varied by age ( $\chi^2 p=0.0004$ ), with higher odds in ages 9–11 versus 12–14 (OR 3.13, 95% CI 1.66–5.90), and no differences by language, race, ethnicity, or insurance. This pilot did not demonstrate clear effectiveness of manual outreach but supports earlier vaccine initiation and suggests automated, scalable systems with longer follow-up may better improve completion.

## Introduction

- Human papillomavirus (HPV) is a highly prevalent sexually transmitted infection responsible for genital warts and multiple cancers, including cervical and oropharyngeal cancers; high-risk strains 16 and 18 account for ~70% of cervical cancers.
- The 9-valent HPV vaccine (Gardasil 9) provides ~97% protection against nine HPV types and is most effective when administered prior to viral exposure, with routine vaccination recommended at ages 11–12 (starting as early as 9).
- Despite strong efficacy, U.S. vaccination coverage remains suboptimal, with only 57.3% of adolescents aged 13–15 receiving at least one dose in 2023, below the Healthy People 2030 goal of 80%.
- HPV affects approximately 40% of individuals at any given time in the U.S. and causes ~37,800 cancers annually, contributing to significant but largely preventable morbidity, mortality, and healthcare burden.
- System-wide interventions at Denver Health increased HPV vaccine completion from 45% to 79%, with even higher rates (87%) at Westside Pediatrics, though delays in completing subsequent doses persist.
- This project aims to address gaps in timely series completion through a pilot annual reminder-recall intervention targeting patients overdue for dose two or three.

## Methodology

- Retrospective quality improvement study of established patients aged 9–17 years overdue for HPV vaccine doses, identified via EPIC EHR at a single pediatric clinic.
- Patients received reminder-recall outreach via scripted phone or prewritten MyChart message, with language-appropriate communication (interpreters and translated messages for Spanish-speaking families).
- Outcomes were assessed 8 weeks post-intervention, categorizing patients as vaccinated after outreach, vaccinated without outreach, or not vaccinated.
- Data were manually abstracted from the EHR and analyzed using chi-square and logistic regression to evaluate differences in vaccination completion.



**Table 1. Characteristics Denver Health Westside Pediatrics patients aged 9-17 who were overdue for 2nd or 3rd HPV dose**  
D2A= Decline to answer

		Total		Phone Call		Answer		MyChart Message		Opened		No MyChart		HPV Completed		$\chi^2$ p-value
		#	%	#	%	#	%	#	%	#	%	#	%	#	%	
<b>Age</b>	9 - 11	322	46.9%	0	0.0%	0	0.0%	251	61.8%	67	70.5%	68	25.3%	50	68.5%	0.0004
	12 - 14	234	34.1%	0	0.0%	0	0.0%	126	31.0%	23	24.2%	106	39.4%	13	17.8%	
	15 - 17	130	19.0%	32	100.0%	9	100.0%	49	12.1%	8	8.4%	73	27.1%	10	13.7%	
<b>Language</b>	English	437	63.7%	22	68.8%	5	55.6%	266	65.5%	65	68.4%	163	60.6%	42	57.5%	0.386
	Spanish	234	34.1%	10	31.3%	4	44.4%	134	33.0%	30	31.6%	97	36.1%	30	41.1%	
	Other	15	2.2%	0	0.0%	0	0.0%	6	1.5%	0	0.0%	9	3.3%	1	1.4%	
<b>Race</b>	White	390	56.9%	14	43.8%	6	66.7%	254	59.6%	58	59.2%	129	52.2%	41	56.2%	0.999
	Black or African American	66	9.6%	7	21.9%	3	33.3%	43	10.1%	12	12.2%	20	8.1%	7	9.6%	
	Other	184	26.8%	8	25.0%	0	0.0%	104	24.4%	26	26.5%	78	31.6%	20	27.4%	
	D2A	46	6.7%	3	9.4%	0	0.0%	25	5.9%	2	2.0%	20	8.1%	5	6.8%	
<b>Ethnicity</b>	Hispanic/Latino / Spanish Origin	528	77.0%	17	53.1%	5	55.6%	334	78.4%	73	74.5%	185	81.1%	61	83.6%	0.248
	Not Hispanic/Latino / Spanish Origin	146	21.3%	13	40.6%	3	33.3%	86	20.2%	25	25.5%	57	25.0%	12	16.4%	
	D2A	12	1.7%	2	6.3%	1	11.1%	6	1.4%	0	0.0%	5	2.2%	0	0.0%	
<b>Insurance</b>	Medicaid	583	85.0%	29	90.6%	9	100.0%	360	84.5%	86	87.8%	210	92.1%	66	90.4%	0.295
	Private	42	6.1%	1	3.1%	0	0.0%	29	6.8%	7	7.1%	13	5.7%	4	5.5%	
	None	61	8.9%	2	6.3%	0	0.0%	37	8.7%	5	5.1%	24	10.5%	3	4.1%	

## Results

- HPV vaccination rates showed only modest improvement after the intervention (ages 10–12: 62% → 65.7%; ages 10–17: 72.6% → 72.9%).
- Outreach engagement was low (23% MyChart open rate, 28.1% phone answer rate), but completion was higher among those who opened MyChart messages (39.7%) compared to answered calls (11.1%).
- A substantial proportion of patients (58.9%) completed vaccination without engaging with or receiving outreach.
- Younger age (9–11 years) was strongly associated with higher completion (OR 3.13), while no differences were seen by language, race, ethnicity, or insurance; completion was also associated with being overdue for well-child visits and annual vaccines.

## Conclusion

- HPV vaccine series completion remains critical for cancer prevention, with findings supporting earlier initiation (ages 9–11) to improve completion rates.
- Engagement with outreach varied by modality, with higher completion among patients who opened MyChart messages compared to those who answered phone calls.
- A substantial proportion of patients completed vaccination without documented outreach, highlighting the important role of routine clinical encounters and provider-driven efforts.
- This pilot did not demonstrate clear effectiveness of manual reminder-recall outreach, though prior evidence supports the benefit of structured reminder systems.
- Future efforts should focus on automated, scalable, multi-modal outreach strategies to improve efficiency and impact.
- Continued emphasis on HPV vaccination is essential to address gaps in coverage amid rising vaccine hesitancy and to meet national prevention goals.

## Acknowledgements

My supervisor, Dr. Jessica Jack MD, for bringing the weight of her considerable experience and knowledge to this project. She contributed significant time helping me set up, analyze, and edit this project. Without her, I would not have been able to complete this project. Thanks also to Randie Weiss, who took time to meet with me, guide me through Epic reports and data collection, and answer additional questions as they came up.

I would also like to thank the staff at Westside Pediatrics for completing scheduling and administration of HPV vaccines.

Thanks also to my husband, Dillon Jarrell PhD, who answered many of my simple questions that I would have been too embarrassed to ask anyone else, teaching me how to use Mendeley Reference Manager, and showing me tips and tricks for writing this paper.