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Content of Web-based Continuing Medical Education about HPV Vaccination

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Abstract

Background—Addressing low HPV vaccination coverage will require U.S. health care providers to improve their recommendation practices and vaccine delivery systems. Because readily available continuing medical education (CME) could be an important tool for supporting providers in this process, we sought to assess the content of web-based CME activities related to HPV vaccination.

Methods—We conducted a content analysis of web-based CME activities about HPV vaccination available to U.S. primary care providers in May–September 2016. Using search engines, educational clearinghouses, and our professional networks, we identified 15 activities eligible for study inclusion. Through a process of open coding, we identified 45 commonly occurring messages in the CME activities, which we organized into five topic areas: delivering recommendations for HPV vaccination, addressing common parent concerns, implementing office-based strategies to increase HPV vaccination coverage, HPV epidemiology, and guidelines for HPV vaccine administration and safety. Using a standardized abstraction form, two coders then independently assessed which of the 45 messages each CME activity included.

Results—CME activities varied in the amount of content they delivered, with inclusion of the 45 messages ranging from 17% to 86%. Across activities, the most commonly included messages were related to guidelines for HPV vaccine administration and safety. For example, all activities (100%) specified that routine administration is recommended for ages 11 and 12. Most activities (73%) also noted that provider recommendations are highly influential. Fewer activities modeled examples of effective recommendations (47%), gave specific approaches to addressing common

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parent concerns (47%), or included guidance on office-based strategies to increase coverage (40%).

Conclusions—Given that many existing CME activities lack substantive content on how to change provider practice, future activities should focus on the practical application of interpersonal and organizational approaches for improving HPV vaccine delivery in the clinical setting.

Keywords

HPV vaccination; cancer prevention; content analysis; provider education

Introduction

Widespread human papillomavirus (HPV) vaccination has the potential to prevent over 90% of HPV-associated cancers and is recommended for routine administration for 11–12 year old adolescents in the United States (US) [1]. However, by 2015, only 50% of boys and 63% of girls, ages 13–17, had received at least one dose [2]. Receiving a health care provider's recommendation is one of the strongest predictors of parental acceptance of HPV vaccination and an important component of a successful HPV vaccine delivery system [3]. For this reason, the Centers for Disease Control and Prevention (CDC), the American Academy of Family Physicians (AAFP), and the American Academy of Pediatrics (AAP), among other organizations, encourage providers to strongly recommend HPV vaccination for all eligible adolescent patients at every clinical encounter [4]. Despite this, over one-quarter of age-eligible girls and almost half of age-eligible boys do not receive a recommendation from their health care provider, and providers report they are less likely to strongly recommend HPV vaccination than other adolescent immunizations [5, 6]. In identifying other barriers to successful HPV vaccine delivery, providers report the need for guidance on how to address parental concerns about HPV vaccination and implement office-based strategies to maximize vaccine uptake [7].

Continuing medical education (CME) has the potential to improve provider recommendation practices and increase HPV vaccination coverage in the U.S. CME has been found to improve provider knowledge and impact short- and long-term evidence-based clinical practice in a variety of health domains [8–10]. Participation in online CME has been increasing over the last five years, and many physicians report a preference for web-based CME over more traditional in-person formats [11]. Given the potential impact of web-based CME to increase the frequency and quality of provider recommendations for HPV vaccination, we sought to review the content of web-based CME activities related to HPV vaccination for U.S. primary care providers.

Material and methods

Sample Selection

We conducted a content analysis of web-based HPV vaccine-related CME available at any time during the study period of May 2016 through September 2016. Search terms included continuing medical education or CME and one of the following: human papillomavirus vaccine, HPV vaccine, HPV vaccination, HPV immunization, Gardasil, Cervarix, or 9-valent

HPV vaccine. We also manually searched the following online resources: AAP HPV champion toolkit [12], American Cancer Society's (ACS) National HPV Vaccination Roundtable resource page [13], the National Area Health Education Center (AHEC) Organization HPV Immunization Project [14], CDC HPV resources page [15], Medscape's HPV and Cervical Cancer CE Learning Center [16], and the World Health Organization's (WHO) HPV Vaccine Introduction Clearing House [17]. Finally, we asked experts in HPV vaccination research to identify CME activities.

Of the 20 CME activities we identified, 15 met the following inclusion criteria: (1) content specific to HPV vaccination; (2) intended primarily to educate health care providers; (3) relevant to U.S. audiences; and (4) available online for American Medical Association (AMA) CME credit during the study window (May through September 2016). We excluded 5 activities because they were not intended primarily to educate health care providers on HPV vaccination ($n=1$), not relevant to U.S. audiences ($n=1$), or not valid for CME credit for the specified study window ($n=3$).

Analysis

We analyzed the CME activities via a content analysis in the manner described by Roland and colleagues [18]. To identify key messages, all authors independently conducted open coding of 3 of the 15 activities. We then compared codes to identify 45 commonly occurring messages (Table 1), which we organized into five topic areas. Topics were: (1) delivering recommendations for HPV vaccination, (2) addressing common parent concerns, (3) office-based strategies to increase HPV vaccination coverage, (4) HPV epidemiology and vaccination coverage in the U.S., and (5) HPV vaccine guidelines for administration, safety and cost. Using a codebook and a standardized abstraction form, two authors (MLK, JMG) independently viewed each CME activity and completed the assessment activities, while reviewing for the presence of each of the 45 messages. For topic 2, coders focused specifically on strategies or recommendations for addressing common parent concerns. For example, if an activity contained the message "the vaccine is proven safe," but did not frame the message in response to a parent's concern about safety, coders would assign credit for the message under topic 5 but not topic 2. Coders also assessed CME activities in terms of their use of 6 didactic methods: use of an opinion leader; use of graphs or other data visualization techniques; modeling examples of effective communication; inclusion of questions on provider communication in the post-assessment; use of provider stories (i.e. narratives of provider experiences); and use of patient stories (i.e. narratives of patient experiences). We defined an opinion leader as someone with respected credentials and experience in the field of the target audience. We also categorized the activities by the following format types: online video, online or downloadable webinar (may include PowerPoint slides and audio, but no video), E-course (on-demand, online, multi-media training requiring user participation to advance), and written summaries of peer-reviewed journal articles. The abstraction form also captured the CME title, source, number of credits offered, cost to access, and industry sponsor when applicable. We resolved discrepancies in coding ($n=7$ messages) through review by a third author (MBG).

We analyzed data within and across CME activities. For each activity we calculated the percentage of included messages within each of the 5 topic areas. Across CME activities, we calculated the percentage that included each of the 45 messages and 6 didactic methods. Data were analyzed using Microsoft Excel 2013.

Results

CME characteristics

Among the 15 CME activities, 5 were online videos, 2 were online or downloadable webinars, 4 were E-courses, and 4 were written summaries of peer-reviewed journal articles (Table 1). Educational credits available ranged from 0.25 to 6 AMA credit-hours. One-third (33%) were sponsored by unrestricted educational grants from industry. In terms of cost, 14 activities were free of charge, and 1 was free for members of the sponsoring organization but low cost for non-members (<\$200). The activities included between 17% and 86% of the 45 messages (Table 1).

Didactic Methods

About half of the CME activities included the use of an opinion leader (53%) and graphs or other methods of data visualization (47%). Two fifths (40%) of the activities gave examples of modeling effective communication that providers could use when discussing HPV vaccine. Two fifths (40%) of the activities' post-assessments included questions on provider communication about HPV vaccine. Two fifths (40%) included provider stories, but none of the activities included patient stories.

Messages

Delivering recommendations for HPV vaccination—Overall, 13 (87%) of the 15 activities included one or more messages on delivering recommendations (Table 1). The most frequently included message was: *provider recommendations are highly influential* (73% of the activities contained this message; Table 2). The least frequently included message was *bring up vaccination again at the next visit if the parent declines* (20%).

Addressing common parent concerns—Overall, 8 of the activities (53%) included one or more of the messages on addressing common parent concerns (Table 1). The most frequently included message in this topic area was: *concern about safety* (47% of the activities contained this message; Table 2). The least frequently included message was: *concern about vaccinating boys* (27%).

Office-based strategies to increase HPV vaccination—Overall, 7 of the activities (47%) of the activities included one or more messages on office-based strategies (Table 1). The most frequently included messages were: *use all visits as an opportunity to vaccinate* (40%; Table 2) and *educate all office staff on their roles to promote vaccination* (40%). The least frequently included messages were: *have parents who decline sign a declination form* (13%), *provide families with Vaccine Information Statements (VIS) before seeing the provider* (13%), and *designate an immunization champion in the office* (13%).

HPV epidemiology and vaccination coverage—All 15 of the activities (100%) included three or more messages on HPV epidemiology and vaccination coverage in the U.S. (Table 1). The most frequently included message was: *infection causes genital warts* (80%; Table 2). The least frequently included message was: *there is no treatment or cure for HPV* (25%).

HPV vaccination guidelines, administration, safety, and cost—All 15 of the activities (100%) included two or more messages on administration and safety (Table 1). The most frequently included message was *on-time administration is at ages 11–12 years* (100%; Table 2). The least frequently included message was *the vaccine is covered by insurance and/or Vaccines for Children (VFC)* (40%).

Discussion

In our analysis of web-based CME about HPV vaccination, we found messages pertaining to HPV epidemiology and vaccination coverage, as well as vaccine administration and safety, were common. However, CME activities less often included messages pertaining to delivering recommendations, addressing common parent concerns, or implementing office-based strategies to increase vaccination coverage. Out of 15 CME activities, 5 did not include any messages on addressing parent concerns or implementing office-based strategies. Furthermore, many of the CME activities lacked didactic methods that can help to engage and motivate learners, such as modeling communication or using provider and patient stories [19]. These limitations are concerning given the potential for CME to influence providers' clinical practice and improve HPV vaccination coverage [8]. Several successful intervention studies have used educational webinars to model provider communication about HPV vaccination and address strategies for overcoming barriers to parental acceptance of vaccination [20, 21].

Medical educators can improve future CME by including more practical content aimed at helping providers to increase HPV vaccination coverage in their clinics. While baseline knowledge about HPV epidemiology, vaccination coverage, and vaccine administration and safety information is important, information on specific opportunities for quality improvement is arguably even more important, given that provider behavior is a key reason for low uptake [22]. For example, research suggests that CME can assist providers in improving their HPV vaccine communication by using announcements to introduce vaccination, emphasizing cancer prevention, and consistently recommending same-day vaccination for male and female patients by age 12 [23–25]. Our findings indicate that these provider communication strategies and other components of successful HPV vaccine delivery may be underrepresented in the current CME offerings. However, there were several activities that were more comprehensive in their inclusion of messages about addressing parent concerns and implementing office-based strategies [26–28]. These activities were also notable for their overall production quality and use of interactive formats to engage the user, and could serve as positive examples for future CME on HPV vaccine delivery.

The majority of content in the HPV vaccine-related CME was directed towards increasing pediatricians and family physicians' knowledge and practice. Given that effective HPV

vaccine delivery requires a healthcare team approach, nurses, front office staff, and others have unique roles in communicating with families and identifying and reducing missed opportunities to vaccinate. Our findings suggest a gap in resources for physicians and mid-level providers interested implementing a team-based approach to HPV vaccine communication within their practices. Although several activities contained information about implementing office-based strategies including a delineation of activities to be undertaken at various levels [26, 28], more resources with specific materials by role could improve the existing CME offerings.

Strengths of this study include the use of two, independent coders and a standardized abstraction form. A limitation was our focus on online content; in-person CME activities may offer different content or employ different didactic methods. However, given that an increasing number of providers prefer to access CME content online, we believe that these highly-accessible and low-cost activities are particularly important and can complement more interactive and resource-intensive in-person educational strategies [11]. A second limitation is the restriction to activities available for credit during the study window. CME activities released after September 2016 may differ in content. An additional consideration is that we used open-coding to generate our list of methods. Although this approach is in keeping with the inductive approach of qualitative inquiry, we may have excluded important messages that were not covered in existing activities. Finally, we did not include maintenance of certification (MOC) activities in the analysis. Although MOC activities may provide CME credit, they are more intensive, ongoing, quality improvement activities that were beyond the scope of the present study. Future studies can build on the current work by extending to MOC activities and through efforts to assess the impact of web-based CME and MOC activities on providers' HPV vaccine-related knowledge, attitudes, and communication practices.

Conclusions

In our content analysis of online continuing medical education about HPV vaccination for primary care providers, we found pragmatic approaches to improving HPV vaccine delivery to be underrepresented in comparison to other content such as messages related to HPV epidemiology. Busy health care providers may only complete a few HPV-vaccine related CME activities during their careers. Depending on the activity they select, they may miss important information on quality improvement, such as approaches to discussing common concerns with parents and implementing office-based strategies for increasing HPV vaccination coverage. Future CME on HPV vaccination should focus on filling the gap between knowledge and practice related to HPV vaccine delivery.

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Highlights

- HPV epidemiology, vaccination coverage, administration, and safety were common in online CME.
- Strategies to increase vaccination and address parent concerns were less common.
- Future CME should focus on pragmatic approaches to improving vaccine delivery.

Table 1
Characteristics of continuing medical education (CME) activities related to HPV vaccination ($n=15$).

% of messages covered, by topic and overall ²								
Title	Source [Reference]	Hours Type ¹	1. Delivering recommendations (10 messages)	2. Addressing concerns (5 messages)	3. Office-based strategies (10 messages)	4. Epidemiology (10 messages)	5. Administration & safety (10 messages)	Overall
Videos (n=5)								
The clinical implications of HPV infection *	Medscape [29]	0.25 AMA	20	20	0	70	82	38
Overcoming challenges to adolescent immunization *	Medscape [30]	0.25 AMA	50	0	30	30	18	26
HPV prevention in girls and women *	Medscape [31]	0.25 AMA	50	80	0	30	45	41
HPV prevention in boys and men *	Medscape [32]	0.25 AMA	60	60	0	30	64	43
Preventing HPV-associated disease *	Medscape [33]	1.0 AMA	100	0	50	100	91	68
Webinars (n=2)								
You are the key to HPV cancer prevention	CDC [34]	0.75 AMA	80	80	60	90	73	77
HPV Vaccination webinar	CSTE [35]	1.0 AMA	50	60	30	70	73	57
E-courses (n=4)								
You call the shots: Human Papillomavirus	CDC [36]	1.25 AMA	0	0	0	70	82	30
Adolescent vaccination	UMN [26]	1.0 AMA	90	100	70	80	91	86
Strongly recommending the HPV vaccine	AAP [27]	1.0 AMA	70	100	50	80	82	76
EQIPP: immunizations track 2 - adolescent **	AAP [28]	6.0 AMA	90	80	100	50	73	79
Articles (n=4)								
Increased efforts needed for male HPV vaccination	Medscape [37]	0.25 AMA	0	0	0	60	27	17
Are clinicians effectively endorsing the HPV vaccine?	Medscape [38]	0.25 AMA	80	0	0	30	27	27

% of messages covered, by topic and overall ²						
Title	Source [Reference]	Hours Type ¹	1. Delivering recommendations (10 messages)	2. Addressing concerns (5 messages)	3. Office-based strategies (10 messages)	Overall
Updated ACOG recommendations for human papillomavirus vaccine	Medscape [39]	0.25 AMA	10	0	0	19
ACS Endorses HPV vaccine guidelines for boys and girls	Medscape [40]	0.25 AMA	10	0	0	19

* Indicates industry sponsor for CME activity;

** Indicates CME with cost for non-members

Note. AAP: American Academy of Pediatrics; ACOG: American Congress of Obstetricians and Gynecologists; ACS: American Cancer Society; AMA: American Medical Association; CDC: Centers for Disease Control and Prevention; CSTE: Council of State and Territorial Epidemiologists; CME: Continuing Medical Education; CNE: Continuing Nurses Education; HPV: human papillomavirus; NASN: National Association of School Nurses; UMN: University of Minnesota;

¹ Continuing medical education (CME) hours for American Medical Association Physician's Recognition Award Category 1 credits (AMA PRA CAT 1) or Continuing nursing education (CNE).

Table 2

Content of continuing medical education (CME) activities.

	No. of CME that include the message	(%)
Topic 1. Delivering recommendations for HPV vaccination		
1. Provider recommendations are highly influential.	11	(73)
2. Bundle HPV vaccine with other vaccines, treating all the same.	10	(67)
3. Emphasize cancer prevention, not sexual transmission.	10	(67)
4. Use a presumptive style (statement) for recommendation.	10	(67)
5. Encourage same-day vaccination; discourage delays.	8	(53)
6. Say vaccine is important, not “optional.”	7	(47)
7. Recommend to all adolescents; do not recommend based on perceived risk.	7	(47)
8. Use a structured approach to communication (e.g., CASE).	5	(33)
9. Do not underestimate parental support for HPV vaccine.	4	(27)
10. Bring up vaccination again at the next visit if the parent declines.	3	(20)
Topic 2. Addressing common parent concerns		
1. Concern about safety: vaccine is well tested and very safe; side effects are minor.	7	(47)
2. Concern about sex: vaccination does not promote sexual activity.	6	(40)
3. Concern that vaccine is unnecessary: HPV infection is common; vaccination prevents cancer.	6	(40)
4. Concern that child is too young: vaccine works best at ages 11–12 years.	6	(40)
5. Concern about vaccinating boys: HPV vaccine has benefits for males.	4	(27)
Topic 3. Office-based strategies to increase vaccination coverage		
1. Use all visits (sick and well) as an opportunity to vaccinate.	6	(40)
2. Educate all office staff on their roles to promote vaccination.	6	(40)
3. Screen and flag charts/medical records for every visit.	5	(33)
4. Use a reminder/recall system.	5	(33)
5. Schedule follow-up doses when the series is initiated.	4	(27)
6. Use standing orders or a vaccination protocol.	4	(27)
7. Know your practice coverage for HPV vaccination; use immunization information system.	3	(20)
8. Have parents who decline sign a declination form.	2	(13)
9. Provide families with Vaccine Information Statement (VIS) before seeing the provider.	2	(13)
10. Designate an immunization champion in the office.	2	(13)
Topic 4. HPV epidemiology and vaccination coverage in United States		
1. Infection causes genital warts.	12	(80)
2. Description of HPV-attributable cancer burden among U.S. females.	11	(73)
3. Description of HPV-attributable cancer burden among U.S. males.	10	(67)
4. HPV infection is very common.	10	(67)
5. HPV infection is asymptomatic.	9	(60)
6. Vaccination coverage is low in the U.S.	9	(60)
7. There are disparities in vaccination coverage by geography, age, gender etc.	7	(47)
8. Coverage for HPV vaccination is lower than for Tdap and MenACWY.	7	(47)
9. Infection most often occurs in adolescence or early adulthood.	6	(40)
10. There is no treatment or cure for HPV infection.	4	(25)

	No. of CME that include the message	(%)
Topic 5. HPV vaccine guidelines, administration, safety and cost		
1. On-time administration is at age 11–12.	15	(100)
2. Vaccine is effective in preventing HPV infection and pre-cancers.	14	(93)
3. The vaccine is proven safe; there is no evidence of serious/long-term side effects.	13	(87)
4. The catch-up schedule extends to ages 13–26 years for females and 13–21 for males.	11	(73)
5. Three doses are recommended at 0, 1–2 months, and 6 months.*	10	(67)
6. Common side effects include pain, swelling at the injection site, and syncope.	9	(60)
7. Early but acceptable administration is at ages 9–10.	9	(60)
8. Protection lasts at least 8–10 years; there is no evidence of waning immunity.	8	(53)
9. Antibody response is better when given on-time (ages 11–12 years) versus late.	7	(47)
10. The vaccine is covered by insurance and/or Vaccines for Children (VFC).	6	(40)

* The ACIP recommendation for 2-dose series for adolescents under age 15 came out in October 2016, after the search period for CME activities ended for the current study.