In the trenches: A quality improvement project to improve HPV vaccine completion rates in an urban pediatric practice

Practical Strategies for Improving HPV Vaccine Coverage

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Human Papilloma Virus (HPV)

- Worldwide, the prevalence of HPV in cervical tumors is 99.7%
- 80% of all sexually active women exposed
- > 100 types identified
- 30–40 anogenital
  - High-risk: 16, 18, 45, 56
  - Intermediate Risk: 31, 33, 39, 51, 52, 55, 58, 59, 66 and 68
  - Low-Risk: 6, 11, 26, 42, 44, 54, 70, and 73

Non-enveloped double-stranded DNA virus
Cumulative Prevalence of High-Risk HPV Subtypes in cervical cancer

History of HPV Vaccination in USA

- HPV 4 licensed for females in June 2006
- HPV2 licensed for females in Oct 2009
- ACIP recommends either HPV2 or HPV 4 for females age 11-12
- HPV4 licensed for males for prevention of genital warts in 2009
- FDA adds prevention of anal CA in males/females in Dec 2010
- ACIP recommends routine use of HPV4 in males age 11-12 in Oct 2011
# Vaccination Recommendations

**WHO, April 2009**
- 3-dose vaccine schedule over 6 months
- Primary target girls 9 y-13 y

**ACIP, October 2011**
- Either HPV4 or HPV2 is recommended in a 3-dose series for females aged 11 or 12 years.
- HPV4 is recommended in a 3-dose series for males aged 11 or 12 years.

**Catch up Strategy:**
- Females HPV2 or HPV 4: Ages 13-26 if not previously vaccinated
- Males HPV4: Ages 13-21 if not previously vaccinated, Ages 22-26 may be vaccinated but recommended for MSM
3 DOSE SCHEDULE

- #1: HPV4 or HPV 2
- #2: administered 1–2 months after the first dose
- #3: administered 6 months after the first dose (at least 24 weeks after the first dose).

Results. Among females aged 14–19 years, the vaccine-type HPV prevalence (HPV-6, -11, -16, or -18) decreased from 11.5% (95% CI 9.2–14.4) in 2003–2006 to 5.1% (95% CI, 3.8–6.6) in 2007–2010, a decline of 56% (95% CI, 38–69).

Conclusions: Within 4 years of vaccine introduction, the vaccine-type HPV prevalence decreased among females aged 14–19 years despite low vaccine uptake. The estimated vaccine effectiveness was high.
• As the health care providers for women who suffer from cervical and lower genital tract cancers, members of the SGO have long been primary advocates for the prevention of cervical and other human papillomavirus (HPV)-related cancers.

• SGO strongly supports vaccination of both girls and boys against HPV to prevent HPV-related cancers. **Use of these vaccines, coupled with recommended cervical cancer screening, would eliminate most cervical cancer”**

Integration of the HPV Vaccine

Only 4 of 35 countries in the Americas include HPV vaccine in their national or regional immunization programs.

- the United States,
- Canada
- Panama
- Mexico

CDC MMWR, October 14, 2011 / 60(40);1382-1384
## National Vaccination Programs

<table>
<thead>
<tr>
<th>Country</th>
<th>Year Init.</th>
<th>Target Pop./Age</th>
<th>Catch up Age</th>
<th>Geog. Scope</th>
<th>2010 Uptake</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>2006</td>
<td>F/ 11-12</td>
<td>13-26</td>
<td>100%</td>
<td>32%</td>
</tr>
<tr>
<td>Canada</td>
<td>2007</td>
<td>F/9-15</td>
<td>varies</td>
<td>100%</td>
<td>&gt;80%</td>
</tr>
<tr>
<td>Panama</td>
<td>2008</td>
<td>F/ 10</td>
<td>none</td>
<td>100%</td>
<td>67%</td>
</tr>
<tr>
<td>Mexico</td>
<td>2008</td>
<td>F/9-12</td>
<td>varies</td>
<td>5%-&gt;100%</td>
<td>N/A</td>
</tr>
</tbody>
</table>

2010: Coverage with at least 1 dose among males aged 13 through 17 years was <2%.
Overview /Problem Statement
Eligible females in the USA are only completing the HPV vaccination series 30-40% and eligible males only 2.5% of the time (NIS-TEEN, US, 2011). HPV related disease continues to cause significant morbidity and mortality which is largely preventable.

Customer(s):
Primary: Individuals meeting HPV vaccination criteria
Secondary: Health care providers of the patients
High Level Needs:
1. Improving HPV vaccination rates
2. Improving documentation

Aim Statement
To improve HPV vaccination completion rates by 25% in 12 months

Project Scope
The University of Texas Pediatric Clinics at Texas Medical Center

Institute of Medicine Aim:
_X_Safe    _X_Effective    _X_Patient Centered
_X_Timely    _X_Efficient    _X_Equitable

Business Case
Research has shown that vaccinating our youth against HPV is cost effective. Assuming completion of HPV vaccination series provides lifelong immunity, vaccinating 12 year old girls yields a cost effectiveness ratio of $43,600 per quality of life year gained. (Kim JJ, NEJM 2008)
### An Overview of our Project

#### AIM

- **Primary objective:** To improve HPV vaccine series completion rates at UT-TMC Pediatrics Clinics

- **Secondary objectives:**
  - To characterize current vaccination rates and processes
  - To understand barriers to completion of HPV vaccine series

#### METHODS

- Obtained IRB approval
- Assembled multidisciplinary research/improvement team
- Created process maps of current and proposed vaccination processes
- Performed retrospective chart review of children ages 9-18 who visited UT-TMC Peds Clinics in August 2012
- Surveyed parents of children ages 9-18 visiting UT-TMC Peds Clinics
- Implement improvement strategies
Comparison of estimated USA, Texas, and UT-Houston Peds Clinic HPV vaccination rates

Males trail females by a significant margin...

...possibly due to more recent FDA approval for use in males (2009 vs 2006 for females).

Whatever the reason, both groups have plenty of room for improvement.

USA and Texas data from 2011 National Immunization Survey, CDC.gov
UT data from 2010-2011 chart review, P.C. Dr. Barratt
HPV Series Completion – August 2012 Cohort

Circle size represents avg. time to complete vaccine series (in months).

...but over the long-term, more girls end up completing the series.

More boys complete the series in the recommended time frame...

Circle size represents avg. time to complete vaccine series (in months).
Exploring parents’ prior knowledge and experience

Higher income is correlated with greater awareness of vaccine...

...but lesser chance of having gotten a dose.

Similar trends when broken down by Medicaid vs. Private Insurance
Why do parents refuse the HPV vaccine?

1. Child not sexually active
2. Didn’t know enough about
3. Possibility of side effects

- Possibility of side effects
  - Didn’t know boys should get it
- Child was too young (under 9 yrs old)
- Unable to return for 2nd/3rd doses
- Didn’t know it was needed
- Child was pregnant
- Couldn’t afford it

n = 68 responses from 37 respondents
Barriers to completion... and possible solutions

Which of the following might prevent you from returning for doses 2 and 3?

- Unable to take off work/school
- Might forget
- Cost of parking
- Cost of vaccine
- Transportation

Which of the following might help you return for doses 2 and 3?

- Text message reminders
- Email reminders
- Parking validation
- Extended clinic hours
Would a TEXT MESSAGE reminder help?

Of those who answered “no”: 25% said they were not comfortable with texting, and 19% said that they would prefer an email reminder.
What about an EMAIL reminder?

Of those who answered “no”: 30% said that they do not have an email address, 20% do not check email regularly, and 15% said it would get lost among junk mail.

Interest was not as strong, but showed a direct correlation with income level.
To: Mrs. Johnson  
Subject: REMINDER: HPV vaccination appointment  

Dear Mrs. Johnson,

Your child’s appointment for the next dose of the HPV vaccine is on 6/10/13 at 10:15am at UT Pediatrics on 6410 Fannin Street, Suite 500. If you need to reschedule, or if you have any questions, please call 713-443-2380.

Thank you,  
UT Physicians
Cervical Cancer

Cervix uteri
Age-Standardized incidence rate per 100,000

GLOBOCAN 2002, IARC
Do we have the tools?

Cure for Cervical Cancer
- No cure for stage IV or recurrent disease

Prevent Cervical Cancer
- Screening and treatment of pre-invasive disease
- HPV vaccination rate improvement
  - Patient and parent education
  - Health care provider education
  - Implementation of systems based approaches
  - Political and financial support
  - Advocacy

No cure for stage IV or recurrent disease
Process improvement: Rapid cycle strategy

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http://commons.wikimedia.org/wiki/File%3APDCA_Process.png
Conclusions

- Disparities in health literacy with HPV vaccination continue in relation to socioeconomic status
- Parents are open to new reminder strategies
- Operationalize vaccine delivery will reduce variation and may improve vaccine initiation and completion
- Other vaccine delivery sites outside of the doctors’ office may improve rates further.
- You can make a difference
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Thank You!