Over 170 types of HPV classified

Updated incidence/prevalence estimates (CDC):
• 14 million new infections per year
• 79 million people infected in the US

deVilliers, 2013, *Virology*
Satterwhite, 2013, *STD*
HPV Vaccines

Bivalent: GSK Cervarix®
- Types 16, 18
- Prevents cervical cancer
- FDA-approved for females 10-25
- 3-dose series; $365

Quadrivalent: Merck Gardasil®
- Types 6, 11, 16, 18
- Prevents warts, cervical cancer, anal cancer
- FDA-approved for females and males 9-26
- 3-dose series; $375

Nonavalent: Merck V503
- Types 6, 11, 16, 18, 31, 33, 45, 52, 58
- FDA biologics license application Dec 2013
Reduction in pre-cancer endpoints
Nonavalent vs quadrivalent vaccine

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Nonavalent n=7099</th>
<th>Quadrivalent n=7105</th>
<th>% reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIN 2/3 or AIS, VIN2/3, VaIN 2/3</td>
<td>1</td>
<td>30</td>
<td>96.7% (80.9-99.8)</td>
</tr>
</tbody>
</table>

Non-inferior immunogenicity for types 6/11/16/18

CIN = Cervical Intraepithelial Neoplasia
AIS = Adenocarcinoma in situ
VIN = Vulvar Intraepithelial Neoplasia
VaIN = Vaginal Intraepithelial Neoplasia

Merck, EUROGIN Abstract SS 8-4, Nov 2013
IS HPV VACCINE SAFE?

~57 Million doses

confirmed deaths related to HPV vaccine

As of March 2013

21194

people suffering side effects

~1700

people suffering serious side effects

85

people dying within a year of vaccination

Data: www.cdc.gov/vaccinesafety/

Graphic: www.informationisbeautiful.net/
HPV vaccine safety monitoring - VAERS

• ~57 million HPV4 doses distributed in the United States from 6/2006 through 3/2013

• No new safety concerns have been identified in post-licensure vaccine safety surveillance among male or female recipients of HPV4 vaccine
  – Among the 7.9% of reports coded as “serious”, most frequently cited are headache, nausea, vomiting, fatigue, dizziness, syncope, generalized weakness

• Syncope continues to be a frequently reported adverse event among adolescents
  – Adherence to a 15-minute observation period after vaccination is encouraged
Who should NOT get the vaccine?

• Pregnant women
  – Lactating women: OK

• Patients with a serious allergy to any component of the vaccines
  – HPV4: Yeast
  – HPV2: Latex (if using pre-filled syringes)
<table>
<thead>
<tr>
<th>Population</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Females</strong></td>
<td></td>
</tr>
<tr>
<td>Gender Age</td>
<td>ROUTINE VACCINATION WITH EITHER HPV4 OR HPV2</td>
</tr>
<tr>
<td>Females</td>
<td>11-12 (MAY START AT 9)</td>
</tr>
<tr>
<td></td>
<td>ROUTINE VACCINATION WITH EITHER HPV4 OR HPV2*</td>
</tr>
<tr>
<td></td>
<td>13-26</td>
</tr>
<tr>
<td><strong>Males</strong></td>
<td></td>
</tr>
<tr>
<td>Gender Age</td>
<td>ROUTINE VACCINATION: HPV4</td>
</tr>
<tr>
<td>Males</td>
<td>11-12 (MAY START AT 9)</td>
</tr>
<tr>
<td></td>
<td>ROUTINE VACCINATION: HPV4</td>
</tr>
<tr>
<td></td>
<td>13-21</td>
</tr>
<tr>
<td><strong>MSM &amp; HIV+ Males</strong></td>
<td>PERMISSIVE RECOMMENDATION: HPV 4</td>
</tr>
<tr>
<td>Gender Age</td>
<td>ROUTINE VACCINATION: HPV 4</td>
</tr>
<tr>
<td>MSM &amp; HIV+ Males</td>
<td>22-26</td>
</tr>
</tbody>
</table>

* Irrespective of history of abnormal Pap, HPV, genital warts

MMWR, May 28 2010; 59(20):626-629, 630-632
MMWR, December 23 2011; 60(50):1705-1708
Providers recommend vaccination too late

• Survey of N=1,013 Family Physicians, Pediatricians, and ObGyns

• 34.6% of physicians reported “always” recommending the HPV vaccine to early adolescents vs 52.7% to middle adolescents, and 50.2% to late adolescents/young adults.

Vadaparamil 2011, Vaccine
Q and A for Audience

• Average age of penile-vaginal sex in US?
  • Boys
  • Girls

• Sexual behaviors before penile-vaginal sex?
HPV acquisition prior to sexual debut among U.S. female

• Among n=114 girls aged 4-15 years referred to peds gyn (no history of abuse) 13.6% had high risk HPV (Winer 2009)

• Among n=22 virginal adolescent females, 45% had HPV, primarily due to sexual behaviors other than penile-vaginal sex (Shew 2013)

• Among n=250 college-age women 9% had HPV prior to sexual debut (Winer 2010)
If we wait until mid/late adolescence…
Preteen Vaccine Week!

**VACCINES FOR YOUR PREEEN**

Learn about vaccines to help your preteen stay healthy through adolescence and beyond.

**To Do**
- Tdap
- HPV
- Meningococcal
- Flu
- Chickenpox

**Vaccine recommendations for 11-12 year olds**

**Tdap** protects against tetanus, diphtheria, and pertussis (whooping cough). Whooping cough can cause vomiting, gasping for air, and trouble sleeping. It may last for months and is very contagious. The Tdap booster helps older kids because their baby shots wear off. Tdap is required for 7th grade entry in California.

**HPV** (Human papillomavirus) vaccine is recommended for preteen girls and boys. It prevents some cancers, including cervical cancer, and genital warts. HPV vaccine works best when given years before the start of sexual activity, which can spread HPV infection. The vaccine is given in three shots over six months.

**Meningococcal** protects against the devastating bacterial infection meningococcal meningitis. The infection can cause brain damage, arm and leg amputations, kidney damage, and death. It is more common among teens and young adults who are in close contact with others at home or school. The vaccine protects with one shot now and a booster at age 16.

**Flu** (Influenza) is much more serious than the common cold. Even healthy young people can get the flu. Children with chronic conditions like asthma or diabetes are especially at-risk for pneumonia or even death. Flu vaccine is needed every year.

**Chickenpox** (varicella) is more than just an itchy rash. It can cause pneumonia or serious skin infections. Kids need two shots, but many didn’t get their second shot. Ask your doctor if your preteen needs a chickenpox shot.

**Ask the Doctor**
- Does my child need any other catch-up shots like MMR and hepatitis B?
- Can all shots be done in the same appointment?
- Are there any side effects from these vaccines?
- Which vaccines are required for school, and can you give me the documentation I need?
- Will any other shots be needed later on?
- Can I get an updated shot record?
- Can I schedule my child's 2nd and 3rd HPV shots today?

**Your Questions**

**NPHIC GOLD AWARD**
ShotbyShot.org: Personal Stories

• Project of CA Immunization Coalition
• IZ Branch collaborates & promotes

Kristen's story: cervical cancer

Heather's story: cervical cancer

Preteen girls talk about HPV
2014 New HPV Materials

How Important is HPV Vaccine for Preteens and Teens? Ask Kristen’s Dad.

Our daughter Kristen enjoyed a normal, happy childhood. She was a good student, played rugby, cello and guitar. Her life was filled with promise. She graduated from college with a successful career path before her. Then tragedy struck. She was diagnosed with cervical cancer. Eleven months later she died at the age of 23.

You try to protect your children. You remember the good times. You cherish the memories. You pray it never happens again. It doesn’t have to happen. Cervical cancer has one main cause: HPV. That makes it almost 100% preventable. The HPV vaccine could have saved Kristen’s life. Protect your children. Vaccinate them.

— Kristen’s Dad

Kristen passed away from cervical cancer, a cancer caused by human papillomavirus (HPV). HPV is a very common virus that spreads by sexual contact. More than half of men and women will get infected with HPV at some point in their life, but most won’t know when they have it.

HPV infections can cause cervical cancer in women and penile cancer in men. HPV can also cause throat and mouth cancer, anal cancer, and genital warts in both men and women.

But, you can help protect your child from these cancers with the HPV vaccine.

Parents:

DID YOU KNOW
HPV CAUSES

Throat and Mouth Cancers

Cervical Cancer
Vaginal Cancer
Anal Cancer
Penile Cancer

You can prevent certain cancers! Ask your doctor about the HPV vaccine for your child 11 years of age or older.

CDC.GOV/HPV/VACCINE.HTML

As easy as 1 2 3
[Stamp info goes here]

1. Remember to come in for your next HPV shot!
2. Your second HPV shot is due on:
   (1 month after shot #1)
3. Your third HPV shot is due on:
   (4 months after shot #2)

You need all three shots for full protection!
HPV Vaccine Coverage, CA vs US
Adolescents Ages 13-17
National Immunization Survey, 2012

US HPV Vaccine Coverage Remains Flat in 2012
Girls Ages 13-17

*Missed opportunity: healthcare encounter occurring on/after girl's 11th birthday after March 23, 2007 (ACIP's HPV4 recommendations published), during which a girl received at least one vaccine but did not receive HPV vaccine.


*3-dose completion = percentage of females or males who received 3 doses among those who had ≥1 HPV dose and ≥24 weeks between the first dose and the interview date

CDC’s Top Ten
Five for 2013, Five for 2014

CDC’s top priority is improving health security at home and around the world. We made important gains in 2013.

- More than **100,000 smokers quit for life** because of Tips from Former Smokers.
- **Advanced Molecular Detection** helped to quickly define and stop an outbreak of *listeriosis*.
- The **National Healthcare Safety Network** helped more than **12,000 healthcare facilities** reduce infections.
- **One million babies were born HIV-free** over the past 10 years.
- New resources are available to prevent **one million heart attacks and strokes** by 2017.

These are all things to be proud of, but there’s always more work to do. Here are five areas we’re concentrating on for 2014.

- **Increase rates of HPV vaccination.**
- Promote the wise use of **antibiotics**.
- Reduce the risk of **prescription opioid deaths** while making sure patients have safe, effective pain treatment.
- **End polio** everywhere.
- Detect, fight and prevent infectious diseases to improve **global health** and protect **health security**.
Increased Distribution of HPV Vaccine to CA Providers in 2013

HPV vaccine doses distributed to enrolled VFC providers in CA

- 2012: 508,445 doses
- 2013: 616,410 doses (↑21%)
Reporting to California Immunization Registry (CAIR)

2012:
• HPV vaccine doses reported: 394,221
• Patients receiving HPV vaccination in CAIR: 292,032

2013:
• HPV vaccine doses reported: 415,116 (↑5.3%)
• Patients receiving HPV vaccination in CAIR: 301,697 (↑3.3%)
Monitoring HPV Vaccine Impact

• Important to understand impact of the HPV vaccine in general population
• Looking at impact on cervical cancer would take several decades
• Early signs of impact would include reductions in HPV infection, and genital warts
• Impact cervical cancer precursors (CIN 2, CIN3, AIS) surrogate measures for cervical cancer outcomes
Prevalence of HPV 6, 11, 16, 18* in cervicovaginal swabs, by age group
NHANES, 2003-2006 and 2007-2010

Markowitz, et al. JID 2103 *weighted prevalence

56% decline
Genital warts among females by age group, CA Family PACT 2007-2010

Bauer, et al AJP 2012

*P_{trend} < .05
PARTING WORDS…

- Make strong recommendations to parents
- Vaccinate pre-teens
- Put systems in place to ensure completion of series

Thank you!