Vaccine Update

William Atkinson, MD, MPH*

Idaho Shot Smarts Conferences

April 2014

***Representing the Immunization Action Coalition, Saint Paul, MN**

immunization action coalition IAC immunize.org

National Infant Immunization Week

20th ANNIVERSARY

IMMUNIZATION. POWER TO PROTECT.

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Disclosures

- William Atkinson has no financial conflict or interest with the manufacturer of any product named during this presentation
- The speaker will discuss the use of Hib and MMR vaccines in a manner not approved by the FDA
- The speaker will not discuss vaccines not licensed by the FDA

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Disclosures

- The recommendations to be discussed are primarily those of the Advisory Committee on Immunization Practices (ACIP)
  - composed of 15 experts in clinical medicine and public health who are not government employees
  - provides guidance on the use of vaccines and other biologic products to the Department of Health and Human Resources, CDC, and the U.S. Public Health Service

www.cdc.gov/vaccines/recs/acip/

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What's New in Immunization

- Vaccination coverage
- Schedules
- Hib
- Measles redux
- Influenza vaccines
- Hepatitis B vaccine and HCP
- HPV vaccine coverage
- Vaccine hesitancy

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Estimated Coverage of Vaccines Among Children Aged 19-35 Months, NIS 2012

State/Area	Vaccine Series* 4:3:1:3:3:1:4
United States	71.9%
Idaho	63.0%

*Includes ≥4 doses DTaP/DT/DTP, ≥ 3 doses polio, ≥ 1 dose MMR, full series of Hib, ≥ 3 doses Hep B, ≥1 dose varicella, and ≥ 4 doses PCV

www.cdc.gov/vaccines/

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Estimated Coverage of Vaccines Among Children Aged 19-35 Months, NIS 2012

Vaccine	U.S.	Idaho
DTaP3+	94%	93%
DTaP4+	83%	77%
MMR1+	91%	93%
HepB3+	90%	88%
PCV3+	92%	92%
PCV4+	82%	84%
Var1+	90%	90%
RV	69%	68%

www.cdc.gov/vaccines/

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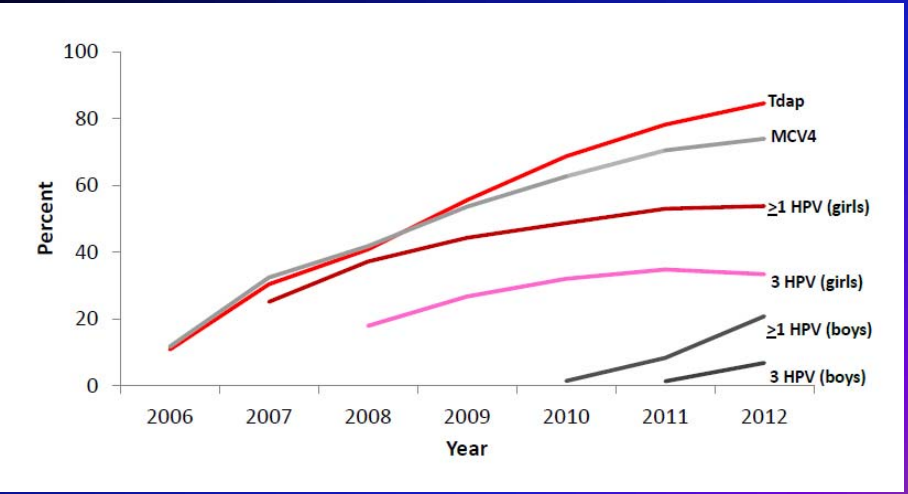
National Estimated Vaccination Coverage Levels among Adolescents 13-17 Years, National Immunization Survey-Teen 2006-2012



MMWR 2013; 62(364: 685-693

2014 Schedules

- MMWR publication in February 2014
  - contains website links to schedules - actual schedules were not included

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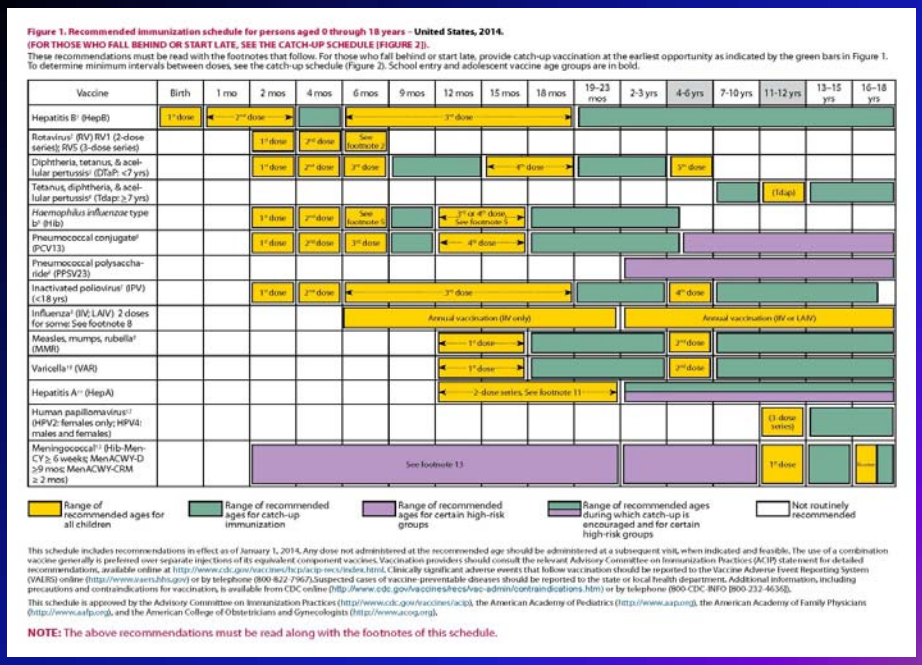


Figure 1. Recommended immunization schedule for persons aged 0 through 18 years – United States, 2014.
(FOR THOSE WHO FALL BEHIND OR START LATE, SEE THE CATCH-UP SCHEDULE [FIGURE 2]).
These recommendations must be read with the footnotes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Figure 1.
To determine minimum intervals between doses, see the catch-up schedule (Figure 2). School entry and adolescent vaccine age groups are in bold.

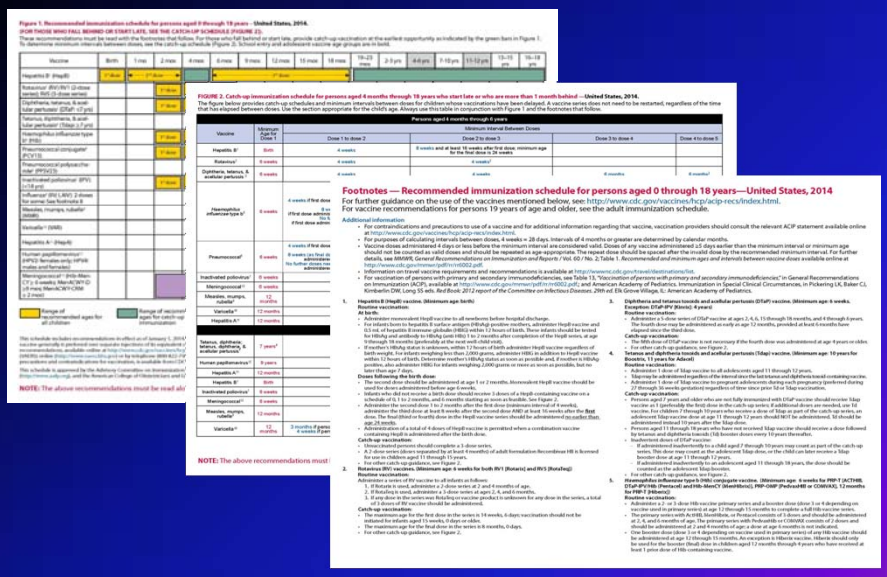
Vaccine	Birth	1 mo	2 mos	4 mos	6 mos	9 mos	12 mos	15 mos	18 mos	19–23 mos	2–3 yrs	4–6 yrs	7–10 yrs	11–12 yrs	13–15 yrs	16–18 yrs
Hepatitis B[1] (HepB)	1st dose	2nd dose			3rd dose											
Rotavirus[2] (RV) RV1 (2-dose series); RV5 (3-dose series)			1st dose	2nd dose	See footnote 2											
Diphtheria, tetanus, & acellular pertussis[3] (DTaP: <7 yrs)			1st dose	2nd dose	3rd dose			4th dose				5th dose				
Tetanus, diphtheria, & acellular pertussis[3] (Tdap: ≥ 7 yrs)														(Tdap)		
Haemophilus influenzae type b[4] (Hib)			1st dose	2nd dose	See footnote 4		3rd or 4th dose, See footnote 4									
Pneumococcal conjugate[5] (PCV13)			1st dose	2nd dose	3rd dose		4th dose									
Pneumococcal polysaccharide[6] (PPSV23)																
Inactivated poliovirus[7] (IPV) (<18 yrs)			1st dose	2nd dose	3rd dose							4th dose				
Influenza[8] (IIV; LAIV) 2 doses for some: See footnote 8					Annual vaccination (IIV only)						Annual vaccination (IIV or LAIV)					
Measles, mumps, rubella[9] (MMR)							1st dose					2nd dose				
Varicella[10] (VAR)							1st dose					2nd dose				
Hepatitis A[11] (HepA)							2-dose series, See footnote 11									
Human papillomavirus[12] (HPV2: females only; HPV4: males and females)														(3-dose series)		
Meningococcal[13] (Hib-MenCY ≥ 6 weeks; MenACWY-D ≥9 mos; MenACWY-CRM ≥ 2 mos)			See footnote 13											1st dose		Booster

Range of recommended ages for all children | Range of recommended ages for catch-up immunization | Range of recommended ages for certain high-risk groups | Range of recommended ages during which catch-up is encouraged and for certain high-risk groups | Not routinely recommended

This schedule includes recommendations in effect as of January 1, 2014. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Vaccination providers should consult the relevant Advisory Committee on Immunization Practices (ACIP) statement for detailed recommendations, available online at http://www.cdc.gov/vaccines/ltc/acip-recs/index.html. Clinically significant adverse events that follow vaccination should be reported to the Vaccine Adverse Event Reporting System (VAERS) online (http://www.vaersdhhs.gov) or by telephone (800-822-7967). Suspected cases of vaccine-preventable diseases should be reported to the state or local health department. Additional information, including precautions and contraindications for vaccination, is available from CDC online (http://www.cdc.gov/vaccines/recs/vac-admin/contraindications.htm) or by telephone (800-CDC-INFO [800-232-4636]).

This schedule is approved by the Advisory Committee on Immunization Practices (http://www.cdc.gov/vaccines/acip), the American Academy of Pediatrics (http://www.aap.org), the American Academy of Family Physicians (http://www.aafp.org), and the American College of Obstetricians and Gynecologists (http://www.acog.org).

NOTE: The above recommendations must be read along with the footnotes of this schedule.



www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html
www.cdc.gov/vaccines/schedules/hcp/imz/catchup.html

2014 Schedules

- **Updated guidance for:**
  - **meningococcal conjugate vaccination as early as 2 months of age for children at increased risk of invasive disease**
  - **pneumococcal and *Haemophilus influenzae* type b (Hib) conjugate vaccination for children with high-risk conditions**
  - **Hib and pneumococcal conjugate vaccine, and tetanus, diphtheria, and acellular pertussis (Tdap) vaccine catch-up schedules updated to provide more clarity**
- **Standardized formatting used for footnotes for each vaccine**

- For other catch-up issues, see Figure 2.

5. *Haemophilus influenzae* type b (Hib) conjugate vaccine. (Minimum age: 6 weeks)

Routine vaccination:

- Administer a Hib vaccine primary series and a booster dose to all infants. The primary series doses should be administered at 2, 4, and 6 months of age; however, if PRP-OMP (PedvaxHib or Comvax) is administered at 2 and 4 months of age, a dose at age 6 months is not indicated. One booster dose should be administered at age 12 through15 months.
- Hiberix (PRP-T) should only be used for the booster (final) dose in children aged 12 months through 4 years, who have received at least 1 dose of Hib.

Catch-up vaccination:

- If dose 1 was administered at ages 12-14 months, administer booster (as final dose) at least 8 weeks after dose 1.
- If the first 2 doses were PRP-OMP (PedvaxHIB or Comvax), and were administered at age 11 months or younger, the third (and final) dose should be administered at age 12 through 15 months and at least 8 weeks after the second dose.
- If the first dose was administered at age 7 through 11 months, administer the second dose at least 4 weeks later and a final dose at age 12 through 15 months, regardless of Hib vaccine (PRP-T or PRP-OMP) used for first dose.
- For unvaccinated children aged 15 months or older, administer only 1 dose.
- For other catch-up issues, see Figure 2.

Vaccination of persons with high-risk conditions:

- Hib vaccine is not routinely recommended for patients older than 5 years of age. However one dose of Hib vaccine should be administered to unvaccinated or partially vaccinated persons aged 5 years or older who have leukemia, malignant neoplasms, anatomic or functional asplenia (including sickle cell disease), human immunodeficiency virus (HIV) infection, or other immunocompromising conditions.

6a. Pneumococcal conjugate vaccine (PCV). (Minimum age: 6 weeks)

Hib Footnote

2013

2014

- For other catch-up guidance, see Figure 2.

5. ***Haemophilus influenzae* type b (Hib) conjugate vaccine. (Minimum age: 6 weeks for PRP-T [ACTHIB, DTaP-IPV/Hib (Pentacel) and Hib-MenCY (MenHibrix)], PRP-OMP [PedvaxHIB or COMVAX], 12 months for PRP-T [Hiberix])**

Routine vaccination:

- Administer a 2- or 3-dose Hib vaccine primary series and a booster dose (dose 3 or 4 depending on vaccine used in primary series) at age 12 through 15 months to complete a full Hib vaccine series.
- The primary series with ActiHib, MenHibrix, or Pentacel consists of 3 doses and should be administered at 2, 4, and 6 months of age. The primary series with PedvaxHib or COMVAX consists of 2 doses and should be administered at 2 and 4 months of age; a dose at age 6 months is not indicated.
- One booster dose (dose 3 or 4 depending on vaccine used in primary series) of any Hib vaccine should be administered at age 12 through 15 months. An exception is Hiberix vaccine. Hiberix should only be used for the booster (final) dose in children aged 12 months through 4 years who have received at least 1 prior dose of Hib-containing vaccine.
- For recommendations on the use of MenHibrix in patients at increased risk for meningococcal disease, please refer to the meningococcal vaccine footnotes and also to *MMWR* March 22, 2013; 62(RR02);1-22, available at http://www.cdc.gov/mmwr/pdf/rr/rr6202.pdf.

Catch-up vaccination:

- If dose 1 was administered at ages 12 through 14 months, administer a second (final) dose at least 8 weeks after dose 1, regardless of Hib vaccine used in the primary series.
- If the first 2 doses were PRP-OMP (PedvaxHIB or COMVAX), and were administered at age 11 months or younger, the third (and final) dose should be administered at age 12 through 15 months and at least 8 weeks after the second dose.
- If the first dose was administered at age 7 through 11 months, administer the second dose at least 4 weeks later and a third (and final) dose at age 12 through 15 months or 8 weeks after second dose, whichever is later, regardless of Hib vaccine used for first dose.
- If first dose is administered at younger than 12 months of age and second dose is given between 12 through 14 months of age, a third (and final) dose should be given 8 weeks later.
- For unvaccinated children aged 15 months or older, administer only 1 dose.
- For other catch-up guidance, see Figure 2. For catch-up guidance related to MenHibrix, please see the meningococcal vaccine footnotes and also *MMWR* March 22, 2013; 62(RR02);1-22, available at http://www.cdc.gov/mmwr/pdf/rr/rr6202.pdf.

Vaccination of persons with high-risk conditions:

- Children aged 12 through 59 months who are at increased risk for Hib disease, including chemotherapy recipients and those with anatomic or functional asplenia (including sickle cell disease), human immunodeficiency virus (HIV) infection, immunoglobulin deficiency, or early component complement deficiency, who have received either no doses or only 1 dose of Hib vaccine before 12 months of age, should receive 2 additional doses of Hib vaccine 8 weeks apart; children who received 2 or more doses of Hib vaccine before 12 months of age should receive 1 additional dose.
- For patients younger than 5 years of age undergoing chemotherapy or radiation treatment who received a Hib vaccine dose(s) within 14 days of starting therapy or during therapy, repeat the dose(s) at least 3 months following therapy completion.
- Recipients of hematopoietic stem cell transplant (HSCT) should be revaccinated with a 3-dose regimen of Hib vaccine starting 6 to 12 months after successful transplant, regardless of vaccination history; doses should be administered at least 4 weeks apart.
- A single dose of any Hib-containing vaccine should be administered to unimmunized* children and adolescents 15 months of age and older undergoing an elective splenectomy; if possible, vaccine should be administered at least 14 days before procedure.
- Hib vaccine is not routinely recommended for patients 5 years or older. However, 1 dose of Hib vaccine should be administered to unimmunized* persons aged 5 years or older who have anatomic or functional asplenia (including sickle cell disease) and unvaccinated persons 5 through 18 years of age with human immunodeficiency virus (HIV) infection.

** Patients who have not received a primary series and booster dose or at least 1 dose of Hib vaccine after 14 months of age are considered unimmunized.*

6. **Pneumococcal vaccines. (Minimum age: 6 weeks for PCV13, 2 years for PPSV23)**

Centers for Disease Control and Prevention

MMWR

Morbidity and Mortality Weekly Report

Recommendations and Reports / Vol. 63 / No. 1

February 28, 2014

Prevention and Control of *Haemophilus influenzae* Type b Disease

Recommendations of the Advisory Committee on Immunization Practices (ACIP)

Continuing Education Examination available at http://www.cdc.gov/mmwr/cme/conted.html.

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

www.cdc.gov/mmwr/pdf/rr/rr6301.pdf

Haemophilus influenzae type B

- Updated ACIP recommendations were published February 2014
- Includes recommendations for:
  - routine vaccination of infants
  - guidance for catch-up of previously unvaccinated infants and children starting late
  - high-risk groups

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Hib Vaccination of High-Risk Persons

TABLE 2. Guidance for *Haemophilus influenzae* type b (Hib) vaccination in high-risk groups

High-risk group*	Hib vaccine guidance
Patients aged <12 mos	Follow routine Hib vaccination recommendations
Patients aged 12–59 mos	If unimmunized or received 0 or 1 dose before age 12 mos: 2 doses, 8 wks apart If received ≥2 doses before age 12 mos: 1 dose 8 wks after last dose If completed a primary series and received a booster dose at age ≥12 mos: no additional doses
Patients aged <60 months undergoing chemotherapy or radiation therapy†	If routine Hib doses administered ≥14 days before starting therapy: revaccination not required If dose administered within 14 days of starting therapy or given during therapy: repeat doses starting at least 3 mos following therapy completion
Patients aged ≥15 mos undergoing elective splenectomy	If unimmunized:§ 1 dose prior to procedure¶
Asplenic patients aged >59 mos and adults	If unimmunized:§ 1 dose
HIV-infected children aged ≥60 mos	If unimmunized:§ 1 dose
HIV-infected adults	Hib vaccination is not recommended
Recipients of hematopoietic stem cell transplant, all ages	Regardless of Hib vaccination history: 3 doses (at least 4 wks apart) beginning 6–12 mos after transplant

* Persons with functional or anatomic asplenia, HIV infection, immunoglobulin deficiency including immunoglobulin G2 subclass deficiency, or early component complement deficiency, recipients of a hematopoietic stem cell transplant, and those receiving chemotherapy or radiation therapy for malignant neoplasms.
† Some experts suggest conducting serologic testing for these patients (**Source:** Rubin LG, Levin MJ, Ljungman P, et al. 2013 IDSA clinical practice guideline for vaccination of the immunocompromised host. Clin Infect Dis 2013;[Epub ahead of print] doi: 10.1093/cid/cit684).
§ Patients who have not received a primary series and booster dose or at least 1 dose of Hib vaccine after 14 months are considered unimmunized.
¶ Some experts suggest vaccination at least 14 days before the procedure (**Sources:** CDC. General recommendations on immunization: recommendations of the Advisory Committee on Immunization Practices [ACIP]. MMWR 2011;60[No. RR-2]; CDC. Recommendations of the Advisory Committee on Immunization Practices (ACIP): use of vaccines and immune globulins in persons with altered immunocompetence. MMWR 1993;42[No. RR-4]; Rubin LG, Levin MJ, Ljungman P, et al. 2013 IDSA clinical practice guideline for vaccination of the immunocompromised host. Clin Infect Dis 2013;[Epub ahead of print] doi: 10.1093/cid/cit684.) Some experts suggest administering a dose prior to elective splenectomy regardless of prior vaccination history (**Source:** American Academy of Pediatrics. *Haemophilus influenzae* infections. In: Pickering L, Baker C, Kimberlin D, Long S, eds. Red book: 2012 report of the Committee on Infectious Diseases. Elk Grove Village, IL: American Academy of Pediatrics; 2012:345–52).

Hib Vaccination of High-Risk Persons

Asplenic patients aged >59 mos and adults	If unimmunized:§ 1 dose
HIV-infected children aged ≥60 mos	If unimmunized:§ 1 dose
HIV-infected adults	Hib vaccination is not recommended
Recipients of hematopoietic stem cell transplant, all ages	Regardless of Hib vaccination history: 3 doses (at least 4 wks apart) beginning 6–12 mos after transplant

* Persons with functional or anatomic asplenia, HIV infection, immunoglobulin deficiency including immunoglobulin G2 subclass deficiency complement deficiency, recipients of a hematopoietic stem cell transplant, and those receiving chemotherapy or radiation therapy for malig

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Another Measles Case Confirmed, Now 26 Affected by NYC Outbreak

Wednesday, Apr 16, 2014 | Updated 12:00 PM EDT

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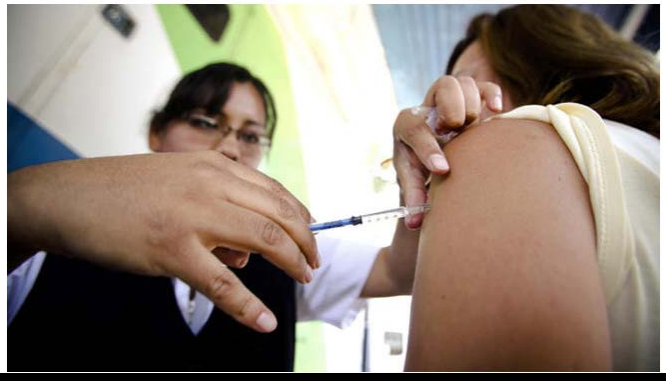

HUFFPOST HEALTH

California Measles Outbreak Highest Since It Was Declared Eradicated, And It's Only April

The Huffington Post | by Lydia O'Connor

Posted: 04/04/2014 1:27 pm EDT | Updated: 04/04/2014 5:59 pm EDT

Like 504

A shocking 49 measles cases have been reported in California to date in 2014, up from only four at this same time last year.

The outbreak is reigniting public health concerns over the anti-vaccination movement; while releasing its data at the end of March, the California Department of Public Health urged residents to consider the startling outbreak's implications.

"This dramatic jump in the number of measles cases is a reminder to get fully vaccinated," Dr. Ron Chapman, CDPH director and state health officer, said in a

The Seattle Times
Winner of Nine Pulitzer Prizes

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April 8, 2014 at 7:26 PM

Warning issued for measles exposure at Sea-Tac airport

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Posted by Paige Cornwell

A traveler from California with a confirmed case of measles was at Seattle-Tacoma International Airport on March 31 and two other Seattle locations the previous day while he was contagious, according to Public Health – Seattle and King County.

The traveler was likely exposed to measles while on the same flight as a person with an earlier confirmed measles case on March 21. Before receiving the diagnosis, the traveler was in West Seattle and Sea-Tac.

Anyone who was at Sea-Tac or the locations listed during the following times was possibly exposed to measles:

Centers for Disease Control and Prevention
MMWR
Morbidity and Mortality Weekly Report
Weekly / Vol. 63 / No. 14
April 11, 2014

Measles Outbreak Associated with Adopted Children from China — Missouri, Minnesota, and Washington, July 2013

Edith N. Nyangoma, MD[1], Christine K. Olson, MD[2], Stephen R. Benoit, MD[2], John Bos, MPH[3], Chas DeBolt, MPH[4], Meagan Kay, DVM[5], Krista Rietberg[5], Azadeh Tasslimi[4], Douglas Baker, DVM[3], Xinwen Feng, MD[6], Susan Lippold, MD[2], Sena Blumensaadt[2], Christopher Schembri, MPH[2], Arnold Vang, DrPH[2], Heather Burke, MPH[2], Gregory Wallace, MD[6], Weigong Zhou, MD[2] (Author affiliations at end of text)

On July 5, 2013, CDC was notified of two cases of laboratory-confirmed measles in recently adopted children from an orphanage in Henan Province, China. To find potentially exposed persons, CDC collaborated with state and local health departments, the children's adoption agency, and airlines that carried the adoptees. Two additional measles cases were identified, one in a family member of an adoptee and one in a third adopted child from China. To prevent further importation of measles, CDC worked with health officials in China, including "panel physicians" contracted

symptoms or signs, the rash was diagnosed as contact dermatitis. By the next day, the rash began on his head and spread to his trunk and extremities, and he developed a fever. The girl (child B) was noted to be febrile on June 29 during her immigration medical examination, but no other symptoms or signs were present. Two days later, the panel physician was told by her adoptive parents that the girl was afebrile and doing well. However, investigators later learned that on June 29 the girl had developed cough, fever, and conjunctivitis, and on July 1 she had developed a rash on her face and neck.

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Infectious Disease

Measles Threatens in Canada, U.S.

Published: Apr 2, 2014

By Michael Smith, North American Correspondent, MedPage Today

save | A A

Health officials in Canada's westernmost province are battling a large measles outbreak that is now threatening to spill over the border into Washington state.

As many as 330 cases of the highly contagious disease have been reported since early March in British Columbia's lower Fraser Valley, near Vancouver, according to Paul Van Buynder, MD, chief medical officer of Fraser Health.

All but two of those cases have occurred among members of an orthodox Protestant sect that doesn't believe in vaccination, Van Buynder told *MedPage Today*.

Five ill members of the congregation live across the U.S. border in Washington state and have been isolated, but Whatcom County officials now say a sixth person -- a woman in her 20s who is not part of the church but who visited the afflicted family — has been infected.

What's worrying is that the sixth person had "multiple public exposures" while she was contagious, including working at a bakery and attending a concert in Seattle, Whatcom County health officer Greg Stern, MD, told *MedPage Today*.

Measles – United States, 2014*

- 129 cases reported to CDC
  - highest number for the date since 1996
  - 58 from California
  - 34 imports (17 from the Philippines)

*as of April 18. MMWR 2014;63:362-3

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Measles – United States, 2013*

- 159 cases reported to CDC from 16 states and NYC
  - 157 (99%) cases are import-associated
  - 23 imports were U.S. residents
  - 146 (92%) unvaccinated or undocumented vaccination status (92 PBE, 15 too young)
- 8 outbreaks accounting for 77% of cases

*as of August 24. MMWR 2013;62:741-43

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Measles
Keep Your Guard Up

- Any patient with fever and rash should be assumed to have measles until proven otherwise
  - immediate isolation
- Be highly suspect of patients with fever and coryza and/or conjunctivitis, particularly if unvaccinated or international travel
- Be certain of your measles immunity status

MMWR 2013;62(RR-4)

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Evidence of Measles Immunity for Healthcare Personnel

- Appropriate vaccination
  - 2 doses of measles-containing vaccine (preferably MMR), or
- Laboratory evidence of immunity, or
- Laboratory confirmation of disease
- Physician-diagnosed disease no longer recommended as evidence of measles (or mumps) immunity

MMWR 2013;62(RR-4)

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MMR Vaccine

- First dose at 12-15 month, second dose routinely at 4-6 years of age
- Minimum interval between doses is 4 weeks
- Infants as young as 6 months should receive MMR before international travel
- Adults born after 1957 with unknown or undocumented MMR vaccination history should receive 1 or 2 doses

MMWR 2013;62(RR-4)

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USA TODAY
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Ohio mumps outbreak grows

Michelle Healy, USA TODAY 4:14 p.m. EDT April 16, 2014

Most of the cases are connected to Ohio State University.

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(Photo: Ty Wright for USA TODAY)

The mumps outbreak in central Ohio now totals 225 cases, state health officials in Columbus reported late Tuesday.

A majority of the reported cases — 139, or 62% — have been linked to Ohio State University, says Julie Mangino, director of the Department of Clinical Epidemiology for the OSU Health System, and a member of the university's Mumps Advisory Executive Team.

The university confirmed its first cases, involving fewer than 10 students, in late February, Mangino says. "Normally in Franklin County, where the OSU Wexner

Seasonal Influenza Vaccination

Influenza Vaccine Strains 2014-2015

- No change from last year's vaccine strains
- Trivalent vaccine will contain:
  - A/California/7/2009 (H1N1)pdm09-like virus
  - A/Texas/50/2012 (H3N2)-like virus
  - B/Massachusetts/2/2012-like virus
- Quadravalent vaccine contains the same three strains as in trivalent vaccine plus:
  - B/Brisbane/60/2008-like virus

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Influenza Vaccines for 2014-15

- Inactivated, trivalent (IIV3)
  - intramuscular
    - standard dose and high-dose
  - intradermal
- Inactivated, quadrivalent (IIV4)
- Live, attenuated, intranasal (LAIV4)

www.cdc.gov/mmwr/pdf/rr/rr6207.pdf

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Choice of Influenza Vaccine

- Where more than one type of vaccine is appropriate and available, **ACIP has no preferential recommendation for use of any influenza vaccine product over another**
  - quadrivalent vs trivalent
  - high-dose vs standard dose
  - IIV vs LAIV in any age group for whom either is indicated

www.cdc.gov/mmwr/pdf/rr/rr6207.pdf

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Press Release

For Immediate Release: Thursday, March 27, 2014
Contact: CDC Media Relations
(404) 639-3286

New Study Shows Flu Vaccine Reduced Children's Risk of Intensive Care Unit Flu Admission by Three-Fourths

Getting a flu vaccine reduces a child's risk of flu-related intensive care hospitalization by 74 percent, according to a CDC study published today in the *Journal of Infectious Diseases.*

The study is the first to estimate vaccine effectiveness (VE) against flu admissions to pediatric intensive care units (PICU). It illustrates the important protection flu vaccine can provide to children against more serious flu outcomes. CDC recommends annual flu vaccination for everyone 6 months and older and especially for children at high risk of serious flu-related complications.

"These study results underscore the importance of an annual flu vaccination, which can keep your child from ending up in the intensive care unit," said Dr. Alicia Fry, a medical officer in CDC's Influenza Division. "It is extremely important that all children – especially children at high risk of flu complications – are protected from what can be a life-threatening illness."

Children younger than 5 years and children of any age with certain chronic medical conditions like

Centers for Disease Control and Prevention

MMWR

Morbidity and Mortality Weekly Report

Recommendations and Reports / Vol. 62 / No. 10

December 20, 2013

CDC Guidance for Evaluating Health-Care Personnel for Hepatitis B Virus Protection and for Administering Postexposure Management

Hepatitis B Vaccine and HCP – New Recommendations

- Management of HCP who have written documentation of a complete series of hepatitis B vaccine doses in the past who were not tested for antibody response following the vaccination series and who now test negative for anti-HBs
  - administer 1 dose of hepatitis B vaccine then test for anti-HBs 1 to 2 months later

MMWR 2013;62(10)

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Hepatitis B Vaccine and HCP – New Recommendations

- Post-exposure prophylaxis
  - when the HBsAg status of the source patient is unknown the exposed unvaccinated or incompletely vaccinated HCP should be managed as if the source patient were HBsAg positive
  - include a dose of HBIG in addition to starting or completing the vaccination series for all exposures where the HBsAg status of the source is unknown

MMWR 2013;62(10)

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TABLE 2. Postexposure management of health-care personnel after occupational percutaneous and mucosal exposure to blood and body fluids, by health-care personnel HepB vaccination and response status

Health-care personnel status	Postexposure testing		Postexposure prophylaxis		Postvaccination serologic testing†
	Source patient (HBsAg)	HCP testing (anti-HBs)	HBIG*	Vaccination	
Documented responder§ after complete series (≥3 doses)	No action needed				
Documented nonresponder¶ after 6 doses	Positive/unknown	—**	HBIG x2 separated by 1 month	—	No
	Negative	No action needed			
Response unknown after 3 doses	Positive/unknown	<10mIU/mL**	HBIG x1	Initiate revaccination	Yes
	Negative	<10mIU/mL	None		
	Any result	≥10mIU/mL	No action needed		
Unvaccinated/incompletely vaccinated or vaccine refusers	Positive/unknown	—**	HBIG x1	Complete vaccination	Yes
	Negative	—	None	Complete vaccination	Yes

Abbreviations: HCP = health-care personnel; HBsAg = hepatitis B surface antigen; anti-HBs = antibody to hepatitis B surface antigen; HBIG = hepatitis B immune globulin.

* HBIG should be administered intramuscularly as soon as possible after exposure when indicated. The effectiveness of HBIG when administered >7 days after percutaneous, mucosal, or nonintact skin exposures is unknown. HBIG dosage is 0.06 mL/kg.

† Should be performed 1–2 months after the last dose of the HepB vaccine series (and 4–6 months after administration of HBIG to avoid detection of passively administered anti-HBs) using a quantitative method that allows detection of the protective concentration of anti-HBs (≥10 mIU/mL).

§ A responder is defined as a person with anti-HBs ≥10 mIU/mL after ≥3 doses of HepB vaccine.

¶ A nonresponder is defined as a person with anti-HBs <10 mIU/mL after ≥6 doses of HepB vaccine.

** HCP who have anti-HBs <10mIU/mL, or who are unvaccinated or incompletely vaccinated, and sustain an exposure to a source patient who is HBsAg-positive or has unknown HBsAg status, should undergo baseline testing for HBV infection as soon as possible after exposure, and follow-up testing approximately 6 months later. Initial baseline tests consist of total anti-HBc; testing at approximately 6 months consists of HBsAg and total anti-HBc.

July 30, 2013

HUFFPOST HEALTH

Edition: U.S.

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HPV Vaccination Rate: 'We're Dropping The Ball,' CDC Director Says

Reuters | Posted: 07/25/2013 2:40 pm EDT

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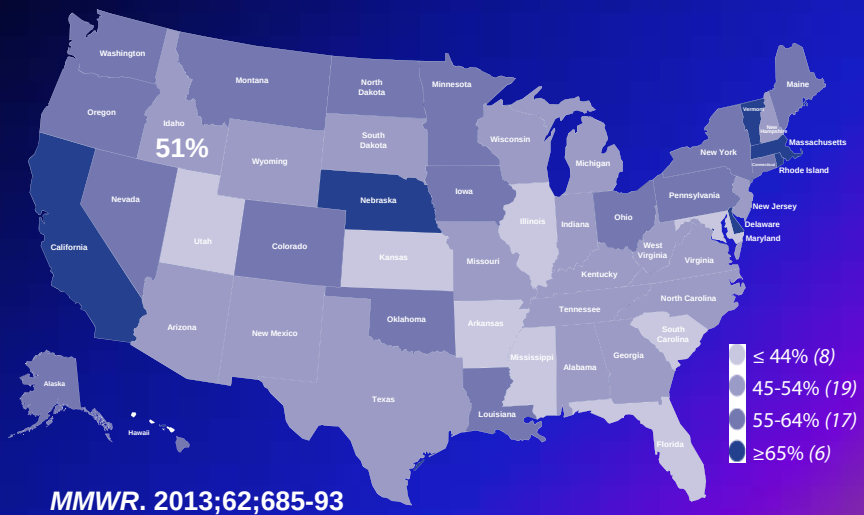
WASHINGTON, July 25 (Reuters) - Only slightly more than half of U.S. girls aged 13 to 17 had been vaccinated against a virus that can cause cervical and other cancers last year, and a top U.S. health official said on Thursday that more must be done to bring the rate up to the long-term goal of 80 percent.

Coverage of 1 of More Doses of HPV Among Adolescent Girls 13-17 Years by State, NIS-Teen 2012



MMWR. 2013;62;685-93

Why HPV Vaccine Coverage Matters

- Currently there are 26 million girls under 13 years of age in the United States
- If none are vaccinated, 168,400 will develop cervical cancer and 54,100 will die from it over the course of their lives

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Why HPV Vaccine Coverage Matters

- Continuing 30% coverage of 12 year old girls would prevent 45,500 of these cases and 14,600 deaths
- Vaccinating 80% would prevent 98,800 cases and 31,700 deaths
- For each year we stay at 30% coverage instead of achieving 80%, 4,400 future cervical cancer cases and 1,400 cervical cancer deaths will occur

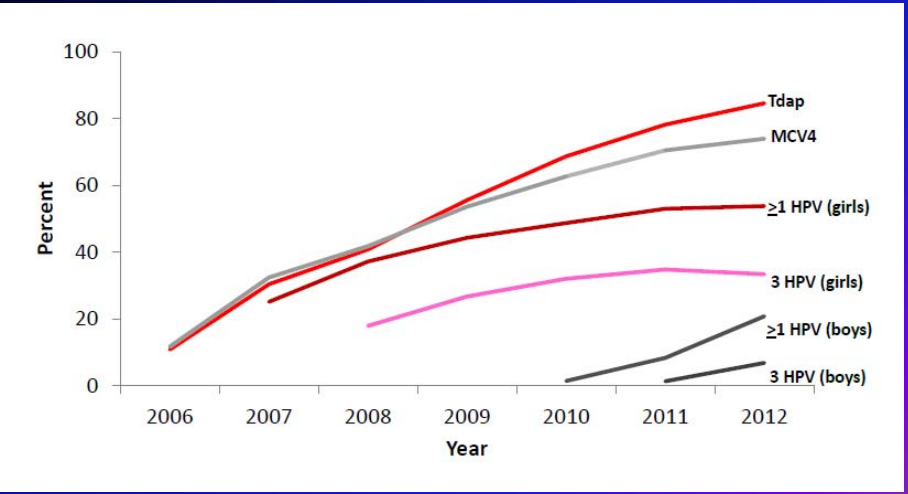
44

Why is HPV Vaccine Coverage Lagging?

- HPV vaccine issues sensationalized by popular media
- Parents think sexuality instead of cancer prevention
- Some clinicians aren't giving strong recommendations
- Phased girls-then-boys recommendations initially confusing to parents

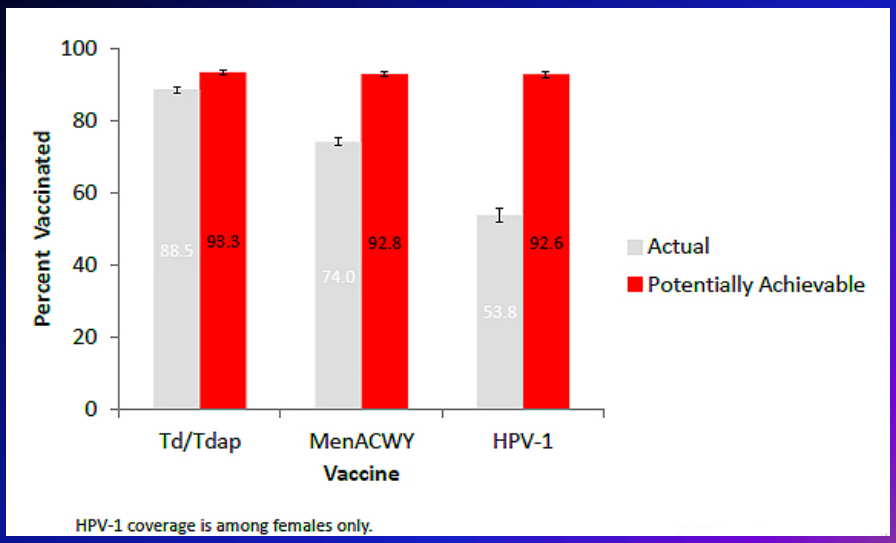
45

National Estimated Vaccination Coverage Levels among Adolescents 13-17 Years, National Immunization Survey-Teen 2006-2012



MMWR 2013; 62(364: 685-693

Actual and Potentially Achievable Vaccination Coverage if Missed Opportunities Were Eliminated: National Immunization Survey-Teen 2006-2012



Missed Opportunities for HPV Vaccination in Idaho

2012 NIS-Teen

Vaccine	Coverage
≥1 Td/Tdap	71%
≥1 MCV	63%
≥1 HPV girls	51%
≥1 HPV boys	16%

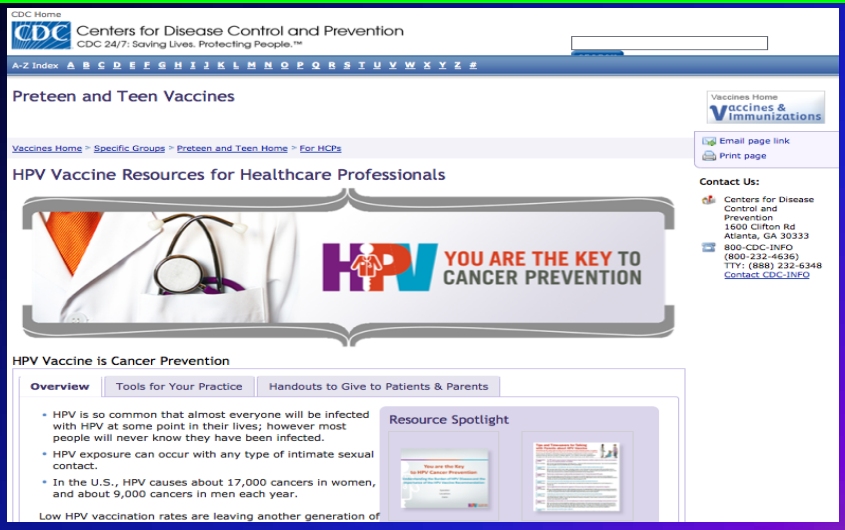
48

Strategies for Increasing HPV Vaccination Rates in Clinical Practices

- **Recommend HPV vaccine!**
  - include HPV vaccine when discussing other needed vaccines
- Integrate standard procedures supporting vaccination
  - assess for needed vaccines at every clinical encounter
  - immunize at every opportunity
  - standing orders
- Reminder and recall
- Tools for improving uptake of HPV: www.cdc.gov/vaccines/teens

49

HPV Vaccination Resources for Providers



www.cdc.gov/vaccines/YouAreTheKey

50

Addressing and Overcoming Vaccine Hesitancy

Causes of Parent/Guardian Vaccine Hesitancy

- Risk versus Benefit
  - risk: side effects, against personal, religious, or political beliefs
  - benefit: protection from vaccine-preventable diseases

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Causes of Parent/Guardian Vaccine Hesitancy

- "Lifestyle" issues
- Political issues
- Fear of side effects

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(August 2013) Kingsville - If you drive in Miss

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21 measles cases linked to megachurch in Texas

The Associated Press
Thursday, Aug. 29, 2013 | 12:18 a.m.

At least 21 cases of the measles have been linked to a North Texas megachurch where an official says they have been trying to contain the outbreak by hosting vaccination clinics.

In a recent sermon posted online, senior pastor Terri Pearsons encouraged those who haven't been vaccinated to do so, while also noting if they think they've "got this covered in your household by faith" not to do it.

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The outbreak started when a person who contracted the measles overseas visited Eagle Mountain

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Quackwatch SM

Your Guide to Quackery, Health Fraud, and Intelligent Decisions

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Homeopathy: The Ultimate Fake

Stephen Barrett, M.D.

Homeopathic "remedies" enjoy a unique status in the health marketplace: They are the only category of quack products legally marketable as drugs. This situation is the result of two circumstances. First, the 1938 Federal Food, Drug, and Cosmetic Act, which was shepherded through Congress by a homeopathic physician who was a senator, recognizes as drugs all substances included in the *Homeopathic Pharmacopeia of the United States*. Second, the FDA has not held homeopathic products to the same standards as other drugs. Today they are marketed in health-food

Homeopathy

- Conceived by a German physician in the late 1700s
- Originally involved the "law of similars"
  - symptoms of disease can be cured by extremely small amounts of substances that produce similar symptoms in healthy people when administered in large amounts
- Products are extremely diluted and generally contain no active ingredient

www.quackwatch.org/01QuackeryRelatedTopics/homeo.html

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Causes of Parent/Guardian Vaccine Hesitancy

- "Lifestyle" issues
- Political issues
- Fear of side effects

59

Causes of Parent/Guardian Vaccine Hesitancy

- "Lifestyle" issues
- Political issues
- Fear of side effects
  - real or imagined

60

How Do We Know Vaccines Are Safe?

- Pre-licensure clinical trials, particularly placebo-controlled studies
- Post-licensure monitoring
  - Vaccine Adverse Event Reporting System (VAERS)
  - Vaccine Safety Datalink (VSD)
  - Clinical Immunization Safety Assessment (CISA) Network

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Recent (and ongoing) Vaccine Safety Concerns by the Public

- MMR and autism
- Additives (particularly thimerosal) in vaccines
- Immune "overload"
- Vaccines and SIDS
- Hepatitis B vaccine and multiple sclerosis
- Hib vaccine and diabetes

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Autism and Vaccines

- Multiple population-based studies have examined the rate of autism among vaccinated and unvaccinated children
- Available evidence does not indicate that autism is more common among children who receive MMR or thimerosal-containing vaccines than among children who do not receive vaccines

63

Studies of Autism and Vaccines*

Taylor, B, et al. Autism and measles, mumps, and rubella vaccine: no epidemiologic evidence for a causal association. *Lancet* 351:2026-2029, 1999.

Kaye JA, et al. Measles, mumps, and rubella vaccine and incidence of autism recorded by general practitioners: a time-trend analysis. *Brit Med J* 322:460-463, 2001.

Madsen KM, et al. A population-based study of measles, mumps, and rubella vaccination and autism. *N Engl J Med*. 2002;347:1477-1482.

Frambonne E, et al. Pervasive developmental disorders in Montreal, Quebec, Canada: prevalence and links with immunizations. *Pediatrics* 118:e139-50, 2006.

Thompson WW, et al. Early thimerosal exposure and neuro-psychological outcomes at 7 to 10 years. *N Engl J Med* 2007; 357(13):1281-92.

Schechter R, Grether JK. Continuing increases in autism reported to California's developmental services system: mercury in retrograde. *Arch Gen Psychiatry* 2008;65(1):19-24.

*partial listing of representative studies

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HEALTH | APR 4, 2013 1:57 PM EDT

Vaccinations Not Linked to Autism, Says New Study

A new study shows that children who receive several vaccines at an early age do not run higher risks of developing autism, a finding that contradicts many of U.S. parents who believe that "too many vaccines too soon" increases the chances their children will develop autism.

The study, soon to be released in *The Journal of Pediatrics*, concludes that children who receive several vaccines on a single day or within the first two years of their lives are just as likely to develop autism as children who receive fewer vaccines.

According to the authors, "The possibility that immunological stimulation from vaccines during the first 1 or 2 years of life could be related to the development of [autism] is not well-supported by what is known about the neurobiology of [autism]." This finding confirms the results of a similar study conducted by the Institute of Medicine in 2004.

Despite such evidence, one-third of U.S. parents continue to express concern that vaccines cause autism and nearly

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Overview

Science News

An Interview with Dr. Geri Dawson, Chief Science Officer, Autism Speaks, about the ding and tism

"... given what the scientific literature tells us today, there is no evidence that thimerosal or the MMR vaccine cause autism. Evidence does not support the theory that vaccines are causing an autism epidemic."

- Dr. Geri Dawson, July 30, 2009

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Resources

Geri Dawson
Chief Science Officer
Autism Speaks

Benefit and Risk Communication

- Opportunities for questions should be provided before each vaccination
- Vaccine Information Statements (VISs)
  - must be provided before each dose of vaccine
  - public and private providers
  - available in multiple languages

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Your Source for VISs www.immunize.org

Communicating with Parents

- What parents want
  - delayed versus alternate schedules
  - facts and statistics
  - trust good websites
  - do not want to be talked down to
  - government to give stats, emotional information from another source
  - unbiased, non-coercive, credible, non-judgmental information

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Communicating with Parents

- For Providers:
  - if provider recommends it, parents more likely to follow
  - ask, acknowledge and advise
  - start at prenatal visit, develop trust
  - offer reliable resources
  - know the science
  - do not get defensive

70

Providers Can Change Minds

Parents With Doubts About Vaccines: Which Vaccines and Reasons Why

Oct 2008, J. of Pediatrics

2003-2004 NIS interviews suggested:

1. 28% of parents doubtful about benefits & safety of certain vaccines

2. Doubtful parents delayed or refused their child's vaccination

Most parents who changed their minds about delaying or refusing vaccination cited **information from their physician** as the main reason for the change

71

How to Have a Successful Dialogue with Parents

- Take time to listen
- Solicit and welcome questions
- Keep the conversation going
- Balance science with anecdotal information
- Acknowledge benefits and risks

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How to Have a Successful Dialogue with Parents

- Respect parents' authority
- Reduce the stress of shots
- Document parents' questions and concerns
- Follow up
- Don't give up

73

www.immunize.org -- p4017

then…

- *Your child will be left at risk of catching the disease.*
- *Your child will be an infectious disease threat to others.*
- *Your child may have to be excluded from school or child care.*

what to do . . .

We strongly encourage you to immunize your child. Please discuss any concerns you have with a trusted healthcare provider or call the immunization coordinator at your local or state health department. Your vaccination decision affects not only the health of your child, but also all of your family, your child's friends and their families, and your community.

For more information about vaccines, go to

- Immunization Action Coalition
  www.immunize.org
  and www.vaccineinformation.org
- Centers for Disease Control and Prevention
  www.cdc.gov/vaccines
  CDC-INFO Contact Center: (800) 232-4636
- American Academy of Pediatrics
  www.aap.org/immunization
- National Network for Immunization Information
  www.nnii.org
- Vaccine Education Center at the Children's Hospital of Philadelphia
  www.vaccine.chop.edu

Immunization Action Coalition
1573 Selby Avenue, Suite 234
Saint Paul, MN 55104
phone: (651) 647-9009
fax: (651) 647-9131
www.immunize.org
www.vaccineinformation.org

This brochure was originally created by the California Department of Public Health (CDPH), Immunization Branch, and was modified with permission by the Immunization Action Coalition (IAC). The content was reviewed by the Centers for Disease Control and Prevention, December 2011. It may be reproduced without permission. If you alter it, please acknowledge it was adapted from CDPH and IAC.

www.immunize.org/catg.d/p4017.pdf • Item #P4017 (12/11)

What if . . . you don't immunize your child?

www.immunize.org -- p2068

Clear Answers & Smart Advice About Your Baby's Shots

By Ari Brown, MD, FAAP

Dr. Brown received her medical degree from Baylor College of Medicine in Houston, Texas; she did her pediatric residency at Harvard Medical School/Boston Children's Hospital. In private practice since 1995, Dr. Brown is perhaps best known as the coauthor of the 411 parenting book series — ***Expecting 411: Clear Answers and Smart Advice for Your Pregnancy, Baby 411,*** **and** ***Toddler 411*** (Windsor Peak Press).

In response to the recent media attention given to vaccines, autism, and other controversies concerning vaccines, the Immunization Action Coalition (IAC) has reprinted a special excerpt from *Baby 411* that answers these questions and more. IAC thanks Dr. Brown for this clearly written information, but mostly, we are grateful for her continued advocacy for safe and effective vaccines.

Vaccines. Autism. Controversy. As a new parent (or parent-to-be), it's hard not to hear the great debate in parenting circles these days—do vaccines cause autism? If not, what causes autism and why is it on the rise?

Let's start at the beginning—just what is autism?

Q: What is autism?

Autism Spectrum Disorder (ASD) is really a collection of several disorders that have three abnormal areas in common: social skills, communication skills, and repetitive or obsessive traits. Specialists use the terms ASD and Pervasive Developmental Disorders (PDD) interchangeably. To add even more confusion, Pervasive Developmental Disorder, not otherwise specified (PDD-NOS), and Asperger's Syndrome also are other categories that fall under the ASD

dren may have little interest in playing with toys. Or they may play in an odd way— such as using a phone as a comfort object.

Bottom line: Children with autism have autism long before their first birthdays, even though their "official" diagnosis usually occurs in their second year of life.

Q: I have a friend whose child has autism. She said he was "perfectly normal" until he was about 18 months old. Does this happen?

A small minority of ASD children have completely normal milestones and then regress, which is known as "late onset autism." These children most likely have a distinct genetic abnormality that turns on or off without any trigger.

---

www.immunize.org

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Welcome to IAC

About Us

The Immunization Action Coalition, a 501(c)(3) non-profit organization, is the nation's premier source of child, teen, and adult immunization information for health professionals and their patients.

Learn More

PROTECT NEWBORNS

New IAC initiative to Give birth to the end of Hep B

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Handouts: Clinic Resources

Parent Handouts

- Administering Vaccines
- Documenting Vaccination
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- Questions and Answers
- Recommendations
- Screening Questionnaires
- Standing Orders
- Storage and Handling
- Supplies Checklist
- Temperature Logs
- Vaccine Reactions
- Vaccine Summaries

After the shots...what to do if your child has discomfort

Tips for parents, includes information about medication that reduce pain and fever (with dosing tables) and FDA Consumer Health Information article about changes to acetaminophen formulations [#P4015]

Language: TURKISH

Note: Important FAQs about changes to acetaminophen formulations for infants

After the shots...what to do if your child has discomfort (no dosing table)

Tips for parents, includes information about medication that reduce pain and fever [#P4014]

Languages: SPANISH • ARABIC • CHINESE • FRENCH
KOREAN • RUSSIAN • VIETNAMESE

Note: Important FAQs about changes to acetaminophen formulations for infants

Chickenpox is a serious disease...make sure your child is protected!

Use this handout to teach parents about the seriousness of chickenpox and the value of vaccination [#P4302]

Preview of handout

CDC Home

Centers for Disease Control and Prevention

CDC 24/7: Saving Lives, Protecting People.™

www.cdc.gov/vaccines/hcp/patient-ed/conversations/conv-materials.html

A-Z Index A B C D E F G H I J K L M N O P Q R S T U V W X Y Z #

Provider Resources for Vaccine Conversations with Parents

Vaccines Home: Vaccines & Immunizations

Conversations Home

- **Talking to Parents about Vaccines**
- Understanding Vaccines and Vaccine Safety
- Vaccine-preventable Diseases
- About Vaccine Conversations with Parents
- Provider Resources Web Tools

Related Links

- Immunization Schedules
- NIIW Educational Resources
- For Parents: Vaccines for Your Children

Vaccines Home > Conversations Home

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Talking to Parents about Vaccines

Talking with Parents about Vaccines for Infants

For health care professionals

Offers communication strategies for successful vaccine conversations with parents and caregivers.

- Color for office printing [295 KB, 4 pages]
- Black & white for office printing [308 KB, 4 pages]

Printed size: 8-1/2"x 11", 4 pages
Commercial printer files available upon request

If You Choose Not to Vaccinate Your Child, Understand the Risks and Responsibilities

For parents and caregivers

Outlines possible risks for parents who choose to delay or decline a vaccine; offers steps for parents to take to protect their child, family and others.

- Color for office printing

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Contact Us:

Centers for Disease Control and Prevention
1600 Clifton Rd
Atlanta, GA 30333

800-CDC-INFO (800-232-4636)
TTY: (888) 232-6348
Contact CDC-INFO

Reviewed March 2012

Talking with Parents about Vaccines for Infants

Strategies for Health Care Professionals

Immunization professionals and parents agree: times have changed.

Because of questions or concerns about vaccines, well-child visits can be stressful for parents. As their infant's health care provider, you remain parents' most trusted source of information about vaccines. This is true even for parents with the most questions and concerns. Your personal relationship uniquely qualifies you to help support parents in understanding and choosing vaccinations.

However, time for infant health evaluation at each well visit is at a premium, as you check physical, cognitive, and other milestones and advise parents on what to expect in the coming months. Therefore, making time to talk about vaccines may be stressful for *you*. But when an infant is due to receive vaccines, nothing is more important than making the time to assess the parents' information needs as well as the role they desire to play in making decisions for their child's health, and then

THIS RESOURCE COVERS:

- What you may hear from parents about their vaccine safety questions and how to effectively address them
- Proven communication strategies and tips for having a successful vaccine

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- Vaccine Schedule
- Vaccine Safety
- Vaccines: Practical Considerations
- Vaccine Science
- Vaccine-Related News
- Additional Resources

Vaccine Mobile App

The Vaccine Education Center is pleased to announce the availability of its newest resource, "Vaccines on the Go: What You Should Know" — a free mobile app for iPhones.

Learn more and download the app today»

Contact Us

We would like to hear from you. Please use our online form to contact us with questions or comments.

»Contact Us Online

Welcome to the Vaccine Education Center

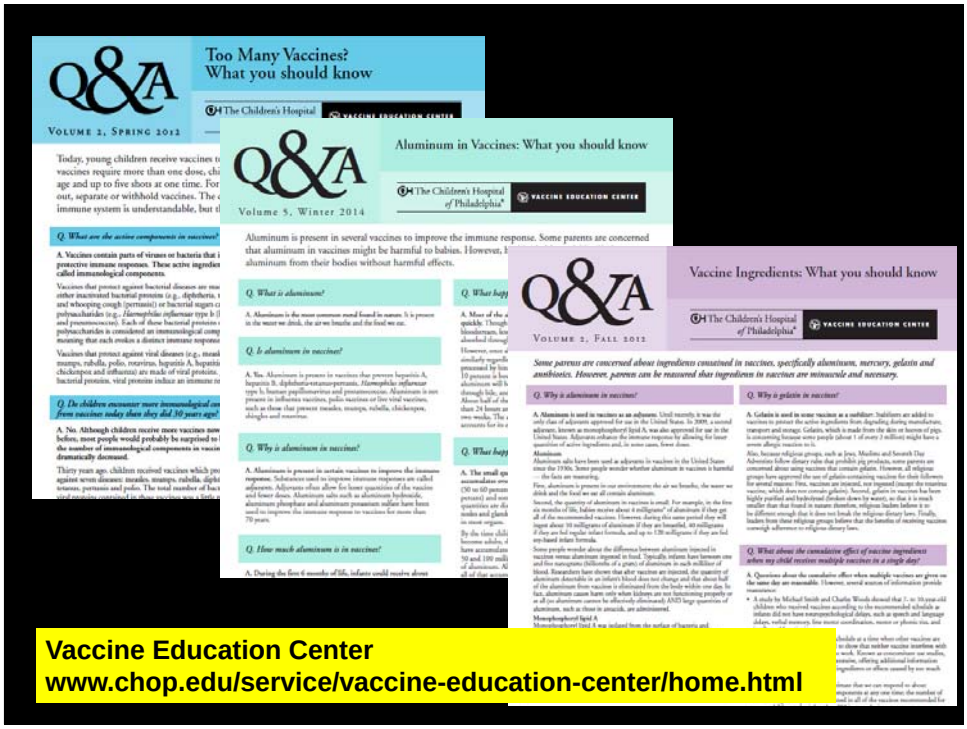
The Children's Hospital of Philadelphia's Vaccine Education Center provides complete, up-to-date and reliable information about vaccines to parents and healthcare professionals.

A Look at Each Vaccine | VEC-Produced Materials
Vaccine Safety | Vaccine Schedule
Practical Considerations | Vaccine Science

Vaccine Mobile App

Always have vaccine information at your fingertips.

www.chop.edu/service/vaccine-education-center/home.html



Vaccine Education Center
www.chop.edu/service/vaccine-education-center/home.html

Resources

- **CDC Vaccines and Immunization Website**
  - **www.cdc.gov/vaccines/**
- **Immunization Action Coalition**
  - **www.immunize.org**
- **Vaccine Education Center at the Children's Hospital of Philadelphia**
  - **www.chop.edu/service/vaccine-education-center/home.html**

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