

# THE ‘NO THIMEROSAL-PRESERVED VACCINES’ LIE

## THIMEROSAL-PRESERVED VACCINES IN 2009?

In spite of the facts, vaccine apologists, “healthcare” officials, and the mainstream media outlets continue to proclaim:

- There are no Thimerosal-preserved vaccines recommended for children, or
- Something to the effect that mercury content of vaccines is either “trace” or zero and has been so, depending on the article, since 2000, 2001, 2002, 2003, 2004 or 2005, or
- The mercury content of vaccines is either “trace or zero” except in some flu vaccines.

**Table I Available Thimerosal-preserved Vaccines Licensed by the U.S. FDA for Administration to Pregnant Women and/or Children Under 18 Years of Age from 2005 -- 2009<sup>1</sup>**

Vaccine (Trade Name)	Vaccine Maker	Maximum Dosings	Mercury Exposure (When all doses are Thimerosal-preserved)
1. <i>DT</i> (No Trade Name)	Sanofi Pasteur, Ltd	4 <sup>1</sup>	100 µg
2. <i>Td</i> (No Trade Name)	Mass Public Health	1 <sup>2</sup>	8.3 µg
3. <i>TT</i> (No Trade Name)	Sanofi Pasteur, Inc	(1) <sup>3</sup>	(25 µg)
<b>4. Influenza, inactivated</b> (Fluzone) [During Pregnancy & 6 months to 4 yrs]	Sanofi Pasteur, Inc (SPI) <sup>4</sup> up to 4-yrs old, then,	“4.5”	112.5 µg
(Fluzone or Fluviron) [(During pregnancy) & 4-18 years of age]	Sanofi Pasteur, Inc or Novartis Vaccines & Diagnostics Ltd	14	350 µg
(Afluria or FluLaval) [During pregnancy to women ≥ 18 yrs]	CSL Limited or ID Biomedical Corp. of Quebec	(1)	(25 µg)
<b>Total Mercury (Hg) from Influenza</b>	-----	<b>18.5</b>	<b>462.5 µg</b>
5. Japanese Encephalitis (JE-VAX) [U.S.-children ≥ 1 year traveling to countries where endemic]	Research Foundation for Microbial Diseases of Osaka University	1-2 <sup>5</sup>	35-70 µg
6. Meningococcal (Menomune A, C, AC and A/C/Y/W-135)	Sanofi Pasteur, Inc; multi-dose	1 <sup>6</sup>	25 µg
<b>Total Maximum Nominal Hg Dose This Scenario</b>	---	---	<u>665.8 µg</u>

<sup>1</sup> If found to be allergic to pertussis component in DTaP vaccine after 1st injection of DTAP vaccine.

<sup>2</sup> See note 1, if allergic to pertussis component and older than 18 months (this “preserved” [0.0033% Thimerosal] vaccine nominally contains about 8.33 µg of mercury per 0.5-mL dose).

<sup>3</sup> See note 1, if deep puncture wound occurs between 12 and 18 years of age and physician thinks vaccination against tetanus is warranted.

<sup>4</sup> In general, half-doses are administered at “6, 7, and 12 – 35 months” with full doses “during pregnancy” and at “≥ 36 months”.

<sup>5</sup> This vaccine has a 0.007% Thimerosal level but the full dose is 1 mL and the half-dose is 0.5-mL. Further, two doses are required with children 1 to 3 years of age getting a half dose, and all > 3 years of age getting a full doses. Thus, depending on starting age and the period between injections, the child may get two 0.5-mL doses, one 0.5-mL dose and one 1-mL dose, or two 1-mL doses – based on when the need to vaccinate may arise.

<sup>6</sup> Only the first dose can be the Menomune vaccine; the subsequent dose(s) must be the Menactra vaccine.

<sup>1</sup> Unless otherwise indicated in a “Table I” note, the nominal level of Thimerosal in these vaccines is 0.01%.

## THE TRUTH ABOUT THE THIMEROSAL-PRESERVED VACCINES RECOMMENDED FOR 'UNIVERSAL' USE IN 2009

Our federal government is currently recommending that:

- a. Developing children should be vaccinated with influenza vaccines annually (or, *in some instances*, more frequently)<sup>2,3</sup> from the time they are 6 months to 18 years of age, and
- b. Pregnant women should be vaccinated during each “flu season” without regard to the stage of their pregnancy<sup>3</sup>.

Yet, the U.S. Centers for Disease Control and Prevention (CDC) is still recommending, *as it has since 2002*, that influenza vaccines (the trivalent inactivated-influenza vaccines [TIVs]) may be given “annually” to “all” pregnant women and children from 6 months to currently 18 years of age without even stating a preference for the vaccines that are not Thimerosal-preserved TIVs.

Furthermore, most ( $\geq 75\%$ ) of all the available doses of the TIVs are still:

- a. Preserved with Thimerosal (49.6% mercury by weight) and
- b. Approved for administration to:
  - i. Pregnant women and/or
  - ii. Children from 6 months to 18 years of age.

This is the case because the U.S. Food and Drug Administration (FDA) has:

- Approved two (2) “newer” multi-dose Thimerosal-preserved TIV formulations (GlaxoSmithKline-subsiary ID Biomedical Corporation of Quebec’s FluLaval<sup>®</sup> and CSL Limited’s Afluria<sup>®</sup>) in the mid 2000s, and
- Continued to reapprove the “older”, pre-2000, multi-dose, Thimerosal-preserved, influenza vaccine formulations (Sanofi-Pasteur’s Fluzone<sup>®</sup> and Novartis Vaccines and Diagnostics Ltd’s Fluvirin<sup>®</sup>).

Furthermore, while claiming to be “working” to remove Thimerosal from vaccines since 1999, the FDA has:

- a. Continued to approve the available Thimerosal-preserved vaccines<sup>4</sup> shown in **Table I** and
- b. Refused to revoke the older licenses for vaccine formulations that were previously Thimerosal-preserved, but now contain either:
  - i. No added Thimerosal or
  - ii. A “trace” ( $\leq 1\ \mu\text{g}$  mercury/0.5-mL dose;  $\leq 2\ \mu\text{g}$  of Thimerosal/0.5-mL dose).

Thus, when FDA-licensed Thimerosal-preserved flu shots are used to meet the CDC’s recommendations, receiving the maximum mercury doses (from the CDC-recommended, TIV

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<sup>2</sup> The CDC’s recommendation for the first-time administration of human influenza vaccines to children is that two (2) doses, separated by about a month, should be administered.

<sup>3</sup> The tentative recommendations for the “pandemic” swine-flu vaccines also call for using a 2-dose regimen (similar to that in footnote 2), for all who are vaccinated, including pregnant women.

<sup>4</sup> <http://www.fda.gov/BiologicsBloodVaccines/SafetyAvailability/VaccineSafety/UCM096228>

vaccination program for pregnant women and developing children 6 months to now 18 years of age) can expose the developing child to **462.5 µg of mercury** (see **Table I**, the doses in **bold**).

In addition, pertussis-vaccine-component-allergic children can be exposed to an additional **108.3 µg** of mercury (see **Table I**, doses in **bolded italics**) when, *after the allergy is discovered*, Thimerosal-preserved DT and Td vaccines are administered in place of the DTaP and Tdap vaccines that are the current primary CDC-recommended vaccines. Therefore, *for children who become allergic to the pertussis component in vaccines, the maximum total dose from conception to 18 years of age is at least 570.8 µg of mercury* (and, under the injection scenario in **Table I**, ignoring the TT shot, is nominally at least 665.8 µg of mercury)<sup>5</sup>.

### **THE TRUTH ABOUT THE PRIMARY THIMEROSAL-PRESERVED VACCINES RECOMMENDED FOR ‘ROUTINE’ USE IN 1999**

In contrast, the 1999 CDC-recommended vaccination program suggested three (3) types of Thimerosal-preserved vaccines for routine administration (see the CDC’s “**Figure 1**”, which is located on page 9 of this article):

1. DTaP and/or (DT and Td), containing 25 µg of mercury per 0.5-mL dose and given no more than 6 times (DTaP/DT given 5 times by 6 years of age and a Td given once between 11 and 16 years of age) before 18 years of age;
2. Hib, containing 25 µg of mercury per 0.5-mL dose and given no more than 4 times before 18 years of age; and
3. Hep B, containing 12.5 µg of mercury per 0.5-mL dose and given up to 4 times before 18 years of age.

In addition, the DT vaccines (for those who were found to be allergic to the pertussis component in the licensed DTaP vaccines), which also contained a nominal maximum of 25 µg of mercury per 0.5-mL dose.

Therefore, when the preceding CDCs vaccination recommendations were followed, vaccination with the aforementioned fully Thimerosal-preserved vaccines would expose the developing child, who was vaccinated:

- Using the 1999-approved Thimerosal-preserved vaccine formulations and
- According to CDC’s 1999 recommendations,

to a nominal total that was not-more-than ( $\leq$ ) 300 µg of mercury by the time that he or she was 18-years old.

### **THE 1999 — 2009 TRUTH ABOUT THE CLAIMED “REDUCTION” IN THE MAXIMUM THIMEROSAL (49.6-WT% MERCURY) EXPOSURE**

The media, the vaccine apologists and government publications and statements are knowingly misleading the public by:

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<sup>5</sup> If, as the government has announced for this year, pregnant women and children are also being recommended to get 2 “swine shots”, the vaccines they are given are Thimerosal-mercury-preserved, and the recommendations are followed, then the maximum mercury exposure for these developing children will increase by another 75 – 100 µg of mercury, *presuming the Thimerosal level is 0.01% and the “swine flu” vaccine dose is 0.5-mL.*

- Focusing on the number of vaccines that never contained any Thimerosal,
- Pointing to the reduction in the number of vaccine types that are Thimerosal-preserved, and
- Ignoring the exposures to the developing child from the doses of Thimerosal-preserved influenza vaccines given to pregnant women as well as
- Pointing to other non-relevant issues, such as the reduction in the “number of antigens”, when the real issues vis-à-vis antigens are:
  - a. The total dose of antigens,
  - b. The specific immune-system reactivity to, and harmful effects of, the total antigen dose, and
  - c. The increased cumulative risk of harmful effects (short- and long-term) from the “persistent” adjuvants (typically, very sparingly soluble polymeric aluminumhydroxy mixtures containing chloride or phosphate in the polymeric matrix [and, though labeled as a preservative, Thimerosal]) added to allow less antigen to be used (which can greatly reduce the vaccine maker’s cost per dose).

Were these sources concerned about the health of our children, then, *at a minimum*, they would be focusing the public’s eye on the maximum number of doses of Thimerosal-preserved vaccines to which a child may be exposed from conception until he or she is 18 years of age.

Based on:

- a. No further change in the CDC’s 2009 recommendations for giving the inactivated human influenza vaccine to: **i)** pregnant women and **ii)** children 6 months to 18 years of age,
- b. Continuing approval of Thimerosal-preserved influenza vaccines, and
- c. The administration of Thimerosal-preserved influenza vaccines to: **i)** the child’s mother during pregnancy and **ii)** the child from shortly after birth until he or she turns 18 years of age,

a *maximally* exposed child born in 2009 will be: **a)** directly given *nominally*<sup>6</sup> 437.5 µg of mercury and **c)** *in utero*, *nominally* exposed to an additional 25 µg of mercury, for a total *nominal* exposure of about 462.5 µg of mercury from the TIVs alone.

When the “*maximum dose/exposure*” issue is the focus, the truth is that the maximum vaccine exposure to Thimerosal (49.6% mercury by weight) that any child may receive by 18 years of age from the influenza vaccine alone (see **Table 1**) is 154 % of the 1999 CDC schedule’s nominal maximum (300 µg of mercury). [See the CDC’s **Figure 1** on page 9 and the preceding discussion.]

Factoring in the children who are allergic to the pertussis component, the 2009 total increases to 570.8 µg of mercury and the 2009 routine vaccination schedule’s maximum is 190 % of the level in the 1999 schedule for those following the CDC’s recommendations and using

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<sup>6</sup> Since the level of Thimerosal in a given released vaccine batch can legally be from 80 % to 125% of the nominal (labeled) level and, based on a limited survey of Thimerosal-containing vaccines, the average level found was close to 105% of the nominal level, the actual theoretical maximum levels would probably be in the range of 105% to 120% of the nominal levels disclosed in the labeling.

the Thimerosal-preserved vaccine formulations like those licensed in the years that the CDC's recommended vaccination schedules were issued.

Thus, *though only one type of routinely recommend vaccine in the CDC's 2009 vaccination schedule is Thimerosal-preserved today*, the maximum level of vaccine-mercury exposure is about 1.5 times the 1999 maximum exposure level to vaccine-mercury from all routinely recommended vaccines (see the CDC's Figure 1) when:

- a. The respective CDC-recommended vaccination guidelines are followed and
- b. All of the doses are FDA-approved Thimerosal-preserved vaccine doses.

Moreover, when, *after the first inoculation*, today's child is found to be "allergic" to the pertussis component in the DTaP and Tdap vaccines, the maximum nominal mercury dose that that child can receive increases to 570.8 µg of mercury – about 1.9 times the 1999 level.

If the federal government proceeds to allow the use of Thimerosal-preserved "swine flu" vaccines (for which the safety of Thimerosal has not been established in the appropriate toxicity studies), *as it currently indicates it is committed to doing*, the maximum dose of mercury that a developing child may receive from "flu" vaccines will increase from 462.5 µg of mercury to 537.5 – 562.5 µg of mercury (1.79 – 1.87 times the 1999 level).

In addition, the maximum mercury dose from all types of "flu" and the DT/Td vaccines will nominally increase from 562.5 µg of mercury to 670.8 µg of mercury (more than twice [2.24 times] the 1999 level).

*Even though Thimerosal has been mostly or totally removed from several types of "childhood" vaccines that were Thimerosal-preserved in the late 1990s (i.e., the DTaP, Hep B, and Hib vaccines)*, the current projected maximum vaccine-mercury dose from just the currently recommended "childhood" human-inactivated-flu shots using the FDA-approved Thimerosal-preserved inactivated-influenza vaccines is now significantly higher than (1.5+ times) the 1999 maximum vaccine-mercury dose.

*If the proposed Thimerosal-preserved "swine flu" shots are given twice to the pregnant women and children in only one year*, the maximum dose from "flu" vaccines for those children born early in the "2009 – 2010 flu season" may increase to about 1.8+ times the 1999 maximum dose (and, for a few developing children, the maximum dose from all Thimerosal-preserved vaccines may increase to more than twice [2.2+ times] the 1999 level)

Plainly, the number of vaccines types that: **a)** contain Thimerosal (added mercury) at a preservative level and **b)** are recommended as the primary vaccines for routine immunization of children (DTaP, TD, Hib, and Hep B in 1999 [4] vs. Influenza in 2009 [1]) is not relevant when **what really needs to stop is the "unnecessary and easily avoidable"<sup>7</sup> mercury exposure from all Thimerosal-preserved vaccines.**

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<sup>7</sup> Since there is: **a)** a "no Thimerosal" TIV Fluzone formulation for children 6 months of age and older as well as for pregnant women; **b)** a "no Thimerosal" LAIV (live attenuated influenza vaccine) for children 2 years of age and older (MedImmune's FluMist®); **c)** a "trace Thimerosal" TIV vaccine (Fluvirin) for children 4 years of age and older as well as for pregnant women; **d)** another "no Thimerosal" TIV for adults including pregnant women (Afluria); and **e)** another "trace Thimerosal" TIV (GlaxosmithKline's Fluarix) for adults including pregnant women, the availability of tens of millions of doses of vaccines "**a) – e)**" clearly renders the administration of the Thimerosal-preserved TIVs to pregnant women both unnecessary and easily avoidable in the USA.

Clearly, the more crucial “vaccines” issue is the maximum total dose of Thimerosal-derived mercury that any developing child may be given!

## **THE GREAT MERCURY-REDUCTION HOAX**

Hopefully, after reading the preceding remarks, all should now clearly understand that the reduction in injected-Thimerosal mercury exposure, *while true for some children*, is actually a hoax. The claimed reduction is a hoax because the maximum mercury exposure total for many, if not most, children from conception to 18 years of age has significantly increased from 2002 onwards over the maximum exposure from the routinely recommended “childhood” vaccines in the CDC’s 1999 recommended “childhood” vaccination schedule (see the CDC’s Figure 1).

Understanding the hoax, all should now understand the major reason why:

- There has been no significant drop in the numbers of new cases of children with a diagnosis in the “autism spectrum”!
- The number of cases of children with:
  - A diagnosis of an autism spectrum disorder (autistic disorder, PDD-NOS, Asperger’s), ADD, ADHD and a variety of other related developmental and behavioral disorders, syndromes, and conditions,
  - Serious birth defects (e.g., cleft palate, microcephaly, and pyloric stenosis),
  - Premature-delivery-related low birth weight,
  - Mitochondrial disorders (e.g., muscle weakness and the failure to thrive)
  - Diabetes,
  - Epilepsy and other seizure disorders,
  - Tics
  - Speech delay,
  - Endocrine disorders (e.g., precocious puberty, hyperandrogyny, and dysmenorrhea)
  - Leukemia,
  - Multiple sclerosis,
  - Cystic fibrosis,
  - Obesity,
  - Cardiovascular and coronary disease,
  - Gastrointestinal disease,
  - Skin disease,
  - Allergies,
  - Asthma, and
  - Other autoimmune diseases,

are continuing to increase in the USA at rates that are:

- ❑ Near epidemic (“ $\leq 1$  in 3,000 [e.g., paralytic polio before DDT and vaccines]”),
- ❑ Epidemic (“ $>1$  in 3,000” [e.g., paralytic polio when vaccines were first introduced] to “ $\leq 1$  in 30” [e.g., ASD diagnoses, where the peak level before flu shots began to be recommended has been estimated to be about 3 in 100]), or,
- ❑ In some instances, above epidemic (“ $> 1$  in 30” [e.g., childhood asthma, currently at  $> 1$  in 10 in the U.S.]).

Since 2002, these increases have been fueled by the **increasing mercury poisoning from the injected organic mercury (Thimerosal) that was introduced via the CDC's 2002<sup>8</sup> recommendation for the "annual" influenza vaccination of pregnant women and children, where the majority of the available doses approved for children and pregnant women are doses of one of the illegally approved<sup>9</sup> Thimerosal-preserved influenza vaccines.**

Moreover, *contrary to the 1999 promise to stop the use of Thimerosal as a preservative in vaccines*, the FDA has:

- ❑ Continued to reapprove several Thimerosal-preserved influenza vaccines that were illegally approved<sup>9</sup> for use in pregnant women and developing children since the 1970s as well as
- ❑ Illegally approved<sup>9</sup> two (2) additional makers of Thimerosal-preserved influenza vaccines with no proof that the preservative level of Thimerosal is safe to the applicable safety standard: "shall be sufficiently nontoxic so that the amount present in the recommended dose of the product will not be toxic to the recipient, ..." (in 21 CFR § 610.15(a)) as required of the FDA by law (see 21 CFR § 601.4(a)).

Finally, given the preceding facts, the reduction of the number of vaccines containing mercury is an obvious "red herring" knowingly designed to mislead the public with an obviously specious argument.

A false argument that ignores, misrepresents, or lies about, the facts that:

- There are still, *as was the case since 2002*, Thimerosal-preserved vaccines that, according to the CDC's recommendations, may be routinely given to pregnant women and/or annually developing children,
- With the addition of the Thimerosal-preserved "swine flu" vaccines, the maximum mercury exposure will again increase significantly in those developing children who are exposed to said vaccines, and
- The maximum total dose from the recommended vaccines for pregnant women and developing children has significantly increased

— as any "con artist" who wanted to focus his or her "mark" on the irrelevant – the number of vaccines without Thimerosal – would.

***Knowing that the danger is in the maximum doses of Thimerosal-preserved vaccines to which a developing child may be exposed and not in the number of "no Thimerosal" vaccines, at a minimum, DEMAND that all Thimerosal-preserved influenza vaccines be immediately banned, recalled, and destroyed as well as that the accountable "healthcare" officials and the manufacturers of these vaccines be appropriately sanctioned.***

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<sup>8</sup> Bridges CB, Fukuda K, Uyeki TM, et al. Prevention and Control of Influenza Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2002 Apr 12; **51**(RR03): 1-31.

<sup>9</sup> See 21 CFR § 601.4(a) which only permits the FDA to legally license a vaccine when the submitted Biological License Application (BLA) proves that the submitter has, among other things, met all legal requirements for safety (see 21 CFR § 601.2) – including, for preserved vaccines, the "sufficiently nontoxic ..." requirements set forth in 21 CFR § 610.15(a) – vaccine manufacturers' requirements that the manufacturers of Thimerosal-preserved vaccines admit they have never met!

## **CONCLUDING REMARKS**

Should any reader find significant factual errors in this short overview, then please send the author (at [paulgkingphd@gmail.com](mailto:paulgkingphd@gmail.com)) your proposed changes to the article along with e-mail attachments that contain copies of the published documents that provide the proof needed to substantiate your claims.

Then, *as has been the case in the past*, the confirmed significant factual errors will be appropriately corrected and a corrected document posted.

If you find spelling or punctuation errors, please also send them in so that this document can be appropriately updated and posted as a “revised draft”.

Respectfully,

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A picture of CDC's "Figure 1" with a picture of its footnotes:

FIGURE 1. Recommended childhood immunization schedule\* — United States, January–December 1999

Vaccine	Age										
	Birth	1 mo	2 mos	4 mos	6 mos	12 mos	15 mos	18 mos	4–6 yrs	11–12 yrs	14–16 yrs
Hepatitis B <sup>f</sup>	Hep B										
Diphtheria and tetanus toxoids and pertussis		Hep B			Hep B					Hep B	
<i>H. influenzae</i> type b <sup>g</sup>			DTaP	DTaP	DTaP		DTaP		DTaP	Td	
Poliovirus**		IPV	IPV	Polio					Polio		
Rotavirus <sup>h</sup>		Rv	Rv	Rv							
Measles-mumps-rubella <sup>i</sup>						MMR			MMR	MMR	
Varicella <sup>j</sup>						Var				Var	

-  Range of Acceptable Ages for vaccination
-  Vaccines to be Assessed and Administered if Necessary
-  Incorporation of this new vaccine into clinical practice may require additional time and resources from health-care providers.

\* This schedule indicates the recommended ages for routine administration of currently licensed childhood vaccines. Any dose not given at the recommended age should be given as a "catch-up" vaccination at any subsequent visit when indicated and feasible. Combination vaccines may be used whenever any components of the combination are indicated and its other components are not contraindicated. Providers should consult the manufacturer's package inserts for detailed recommendations.

<sup>f</sup> Infants born to hepatitis B surface antigen (HBsAg)-negative mothers should receive the second dose of hepatitis B (Hep B) vaccine at least 1 month after the first dose. The third dose should be administered at least 4 months after the first dose and at least 2 months after the second dose, but not before age 6 months. Infants born to HBsAg-positive mothers should receive Hep B vaccine and 0.5 mL hepatitis B immune globulin (HBIG) within 12 hours of birth at separate injection sites. The second dose is recommended at age 1–2 months and the third dose at age 6 months. Infants born to mothers whose HBsAg status is unknown should receive Hep B vaccine within 12 hours of birth. Maternal blood should be drawn at the time of delivery to determine the mother's HBsAg status; if the HBsAg test is positive, the infant should receive HBIG as soon as possible (no later than age 1 week). All children and adolescents (through age 18 years) who have not been vaccinated against hepatitis B may begin the series during any visit. Special efforts should be made to vaccinate children who were born in or whose parents were born in areas of the world where hepatitis B virus infection is moderately or highly endemic.

<sup>g</sup> Diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP) is the preferred vaccine for all doses in the vaccination series, including completion of the series in children who have received one or more doses of whole-cell diphtheria and tetanus toxoids and pertussis vaccine (DTP). Whole-cell DTP is an acceptable alternative to DTaP. The fourth dose (DTP or DTaP) may be administered as early as age 12 months, provided 6 months have elapsed since the third dose and if the child is unlikely to return at age 15–18 months. Tetanus and diphtheria toxoids (Td) is recommended at age 11–12 years if at least 5 years have elapsed since the last dose of DTP, DTaP, or DT. Subsequent routine Td boosters are recommended every 10 years.

<sup>h</sup> Three *Haemophilus influenzae* type b (Hib) conjugate vaccines are licensed for infant use. If Hib conjugate vaccine (FRP-OMP) (PedvaxHIB<sup>®</sup> or ComVax<sup>®</sup> [Merck]) is administered at ages 2 and 4 months, a dose at age 6 months is not required. Because clinical studies in infants have demonstrated that using some combination products may induce a lower immune response to the Hib vaccine component, DTaP/Hib combination products should not be used for primary vaccination in infants at ages 2, 4, or 6 months unless approved by the Food and Drug Administration for these ages.

<sup>i</sup> Two poliovirus vaccines are licensed in the United States: inactivated poliovirus vaccine (IPV) and oral poliovirus vaccine (OPV). The ACIP, AAP and AAP recommend that the first two doses of poliovirus vaccine should be IPV. The ACIP continues to recommend a sequential schedule of two doses of IPV administered at ages 2 and 4 months followed by two doses of OPV at age 12–18 months and age 4–6 years. Use of IPV for all doses also is acceptable and is recommended for immunocompromised persons and their household contacts. OPV is no longer recommended for the first two doses of the schedule and is acceptable only for special circumstances (e.g., children of parents who do not accept the recommended number of injections, late initiation of vaccination that would require an unacceptable number of injections, and imminent travel to areas where poliomyelitis is endemic. OPV remains the vaccine of choice for mass vaccination campaigns to control outbreaks of wild poliovirus.

<sup>j</sup> The first dose of Rv vaccine should not be administered before age 6 weeks, and the minimum interval between doses is 3 weeks. The Rv vaccine series should not be initiated at age 7 months, and all doses should be completed by the first birthday. The AAP opinion is that the decision to use rotavirus (Rv) vaccine should be made by the parent or guardian in consultation with the physician or other health-care provider.

<sup>k</sup> The second dose of measles, mumps, and rubella vaccine (MMR) is recommended routinely at age 4–6 years but may be administered during any visit provided at least 4 weeks have elapsed since receipt of the first dose and that both doses are administered beginning at or after age 12 months. Those who have not previously received the second dose should complete the schedule no later than the routine visit to a health-care provider at age 11–12 years.

<sup>l</sup> Varicella (Var) vaccine is recommended at any visit on or after the first birthday for susceptible children (i.e., those who lack a reliable history of chickenpox [as judged by a health-care provider] and who have not been vaccinated). Susceptible persons aged ≥13 years should receive two doses given at least 4 weeks apart.

Use of trade names and commercial sources is for identification only and does not imply endorsement by CDC or the U.S. Department of Health and Human Services.

Source: Advisory Committee on Immunization Practices (ACIP), American Academy of Family Physicians (AAFP), and American Academy of Pediatrics (AAP).