

OREGON HEALTH AUTHORITY
IMMUNIZATION PROGRAM
DIPHTHERIA AND TETANUS (TOXOIDS) and PERTUSSIS (ACELLULAR) VACCINES
AND COMBINATION VACCINES; INFANRIX® PEDIARIX® KINRIX® DAPTACEL®
PENTACEL® QUADRACEL®

Updates as of 05-14-2015

- Addition of Quadracel[®] : licensed for the 5th dose in the DTaP series and the 4th or 5th dose in the IPV series, for children between 4–6 years of age.¹
- Pediarix^{®2} and Pentacel^{®3} combination vaccines are no longer in short supply.
- Dosing interval updated for children ≥7 but <11 years of age; section III.A. footnote 2. Page 3.¹³
- Removal of expanded use of Kinrix[®]
- Addition of Td column to section VIII. Page 15.¹²
- Appendix: Tetanus containing vaccines; total antigen DTaP, DT, TT, Td, and Tdap, page 21.

I. Order:

1. Check the ALERT Immunization Information System (IIS) to determine whether the patient needs this vaccine and any other vaccines.
2. Screen selected clients for contraindications.
3. Provide the vaccine-specific package insert, answering any questions.
4. Obtain a signed Vaccination Administration Record (VAR)
5. Give DTaP-containing vaccine (0.5 ml), intramuscularly (IM) to infants and children <7 years of age.
 - a. Give according to age-appropriate schedule and anatomic site.
 - b. Give DTaP-containing vaccine simultaneously with all routine childhood immunizations according to age and immunization status of recipient.

Health Officer Signature

Date

II. LICENSED DTaP VACCINES (diphtheria, tetanus, and acellular pertussis) Vaccines ^{* ◊}

Product Name	Vaccine Components	Acceptable Age Range	# of doses in a series
Pediarix ^{®2} (GSK)	DTaP (Infanrix [®]), IPV, Hepatitis B (Engerix-B [®])	6 weeks–6 years of age	1–3 only ^{§ **}
Pentacel ^{®3} (sanofi)	DTaP, IPV, Hib (ActHIB [®])	6 weeks–4 years of age	1–4 only ^{◊◊}
Daptacel ^{®4} (sanofi)	DTaP	6 weeks–6 years of age	1–4 plus 5th [‡]
Infanrix ^{®5} (GSK)	DTaP	6 weeks–6 years of age	1–4 plus 5th [‡]
Kinrix ^{®6} (GSK)	DTaP (Infanrix [®]), IPV	4–6 years of age	5 th dose only ^{‡ §§}
Quadracel ^{®1} (sanofi)	DTaP (Daptacel [®]), IPV	4–6 years of age	5 th dose only ^{‡, §§}

* There is no Thimerosal in any of these vaccines.^{1–6} See Appendix for specific amounts of antigens.

◊ When feasible, the same brand of DTaP vaccine should be used for all doses of the series. If a previous brand is unknown or unavailable, any DTaP vaccine should be used to complete the series rather than defer vaccination.^{7, 8}

§ For infants at low risk for infection with hepatitis B virus (i.e., mother tested negative for hepatitis B surface antigen [HBsAg] at the time of delivery and is not in a high risk group), the hepatitis B series can be completed at any time for children aged 6–18 months.⁸

‡ These vaccines are approved for the 5th dose of the DTaP.^{1, 6}

** May be used interchangeably before or after any individual DTaP, Hep-B or IPV dose in the primary series.^{1, 6, 8}

◊◊ Pentacel[®] is licensed for the first 4 doses of the DTaP series, the first 3 doses of the IPV series and the 4 doses of the Hib series from 6 weeks through 4 years of age.⁷

§§ Kinrix[®] and Quadracel[®] are licensed for the 5th dose in the DTaP series and the 4th dose in the IPV series between 4–6 years of age.^{1, 6, 8} Kinrix[®] tip caps may contain natural rubber latex.⁶

III. A. DTaP and COMBO VACCINE SCHEDULE ^{* ◊ § † ** ◊◊}

Dose/Route: 0.5mL IM			
Dose	Minimum Age ^{§§}	Recommended Age	Minimum Interval ^{§§}
1	6 weeks	2 months	not applicable
2	10 weeks	4 months	≥4 weeks after dose #1
3	14 weeks	6 months	≥4 weeks after dose #2
4	12 months	15–18 months ^{††}	6 months after dose #3 ^{†† ***}
5 ^{* ◊◊◊ §§§}	4 years	4–6 years	6 months after dose #4

* If 6 doses of DTaP-containing vaccine are given before 7 years of age, a Tdap booster is due between 11–12 years of age. If a child <4 years of age has had 5 doses of DTaP (valid and invalid doses), the 6th dose will be due at 4–5 years of age and 6 months after dose 5. The total number of DT-containing vaccines should not exceed 6 by the 7th birthday.^{10, 11}

◊ Td should not be given at <7 years of age. If a child <7 years of age mistakenly receives Td instead of DTaP, the Td dose will not count and must be replaced with a DTaP dose. If the child is ≥7 but <11 years of age, then wait until the child is eligible for Tdap to administer the next diphtheria, tetanus, and pertussis-containing vaccine.^{12, 13}

§ Infants and children with a stable neurologic condition, including well-controlled seizures, may be given DTaP.¹¹

† If pertussis vaccine is contraindicated, do not give DTaP: use DT instead.^{8, 11}

** The use of a DTaP-containing combined vaccine is acceptable as long as one antigen is indicated and the other antigens are not contraindicated.^{8, 11}

◊◊ If a child is older than 1 year of age at the time the first dose of DTaP or DT is given, a third dose given 6–12 months after the second dose completes the primary series. A booster (4th dose) is to be given at ≥4 years of age and at least 6 months after dose 3.¹¹

III. A. Footnotes continued

§§ For retrospective checking, doses that violate the minimum spacing or age by 4 or fewer days do not need to be repeated. Doses administered 5 days or earlier than the minimum interval or age should be repeated, as appropriate for age.⁸

‡‡ If the spacing between the 3rd and 4th dose is ≥ 6 months, and the child is not likely to return at the recommended age, the fourth dose of DTaP may be given as early as 12 months of age.⁸

*** While the recommended minimum spacing between DTaP 3 and DTaP 4 is 6 months, if DTaP 4 is administered ≥ 4 months after DTaP 3, it does not need to be repeated.^{8, 11}

◇◇ The final dose of DTaP is due at or before school entry. The 5th dose is not required if the 4th dose was given on or after the fourth birthday.¹¹

§§§ Children 7–10 who are not fully vaccinated against pertussis and who have no contraindication to pertussis vaccine should receive a single Tdap dose. Fully vaccinated is defined as 5 doses of DTaP or 4 doses of DTaP if the 4th dose was administered on or after the fourth birthday.¹⁴

III B. PEDIARIX[®] COMBO VACCINE: DTaP, IPV, & Hep B ^{* ◊ § ‡}

Dose/Route: 0.5mL IM			
Dose	Minimum Age	Recommended Age	Minimum Interval
1	6 weeks	2 months	
2	10 weeks	4 months	4 weeks after dose #1
3	6 months	6–18 months	8 weeks after dose #2 16 weeks between dose #1 and dose #3

^{*} **NOTE: Pediarix[®] is licensed for the first three doses of the DTaP series. It is not approved for the 4th or 5th dose of the DTaP or IPV series.** However, if this combination vaccine is misadministered as the 4th or 5th dose of the DTaP or IPV series, ACIP suggest that the dose does not need to be repeated and can be counted as valid.¹³

[◊] Pediarix[®] can be used interchangeably before or after any individual DTaP, HepB, or IPV dose in the primary series.¹³

[§] For retrospective checking, doses that violate the minimum spacing or age by 4 or fewer days do not need to be repeated. Doses administered 5 days or earlier than the minimum interval or age should be repeated, as appropriate for age.³

[‡] Pediarix[®] should not be administered to children ≥7 years of age.¹³

III C. PENTACEL® COMBO VACCINE: DTaP, IPV, & HIB (ActHIB®) * † § ‡

Dose/Route: 0.5mL IM			
Dose	Minimum Age	Recommended Age	Minimum Interval**
1	6 weeks	2 months	
2	10 weeks	4 months	4 weeks after dose #1
3	14 months	6 months	4 weeks after dose #2
4	12 months	15–18 months	6 months between dose #3 and dose #4

* **NOTE: Pentacel® is approved for the primary DTaP series and the first booster dose (doses 1–4). It is not licensed for children ≥5 years of age.** However, if Pentacel® is inadvertently administered to children ≥5 years of age, the DTaP, IPV and Hib doses should be counted as valid doses.¹⁴

† Pentacel® may be used to complete the vaccination series in children previously vaccinated with one or more doses of any single or combination DTaP or Hib vaccine when other antigens of Pentacel® are also needed and not contraindicated.¹¹

§ Pentacel's® lyophilized ActHIB® component needs to be reconstituted with the DTaP-IPV component to prepare for vaccine administration. Shake the reconstituted vial thoroughly until a cloudy, uniform suspension results, then vaccinate immediately.^{3, 11}

‡ For a child <7 years of age, with an incomplete immunization series, and if the 1st dose of DTaP or DT was given ≥12 months of age, then a total of 4 doses is needed to complete the childhood series. There is a 6 month interval between doses 2 & 3. The 4th dose is recommended at ≥4 years of age and at least 6 months after dose 3 (catch-up schedule).¹⁴

** For retrospective checking, doses that violate the minimum spacing or age by 4 or fewer days do not need to be repeated. Doses administered 5 days or earlier than the minimum interval or age should be repeated, as appropriate for age.⁸

III C. KINRIX[®] & QUADRACEL[®] COMBO VACCINE:

DTaP & IPV (Infanrix[®] & Daptacel^{®1}) * ◊ § ‡ **

Dose/Route: 0.5mL IM		
Dose	Minimum Age ^{§§}	Recommended Age ^{◊◊ §§ ‡‡}
Booster	4 years	4–6 years

* **NOTE: Kinrix[®] & Quadracel[®] are approved for the booster dose of DTaP and IPV (5th dose of DTaP and the 4th or 5th dose of IPV) at age 4–6 years of age.** However, if Kinrix[®] or Quadracel[®] is administered for an earlier dose of the DTaP and/or IPV series, the dose should be counted as valid and does not need to be repeated provided the minimum interval requirements have been met.^{1, 6, 9, 11, 14}

◊ This combination booster dose can be administered whenever one of the antigens is recommended and the other is not contraindicated.⁸

§ Can be given with MMR and MMRV.⁸

‡ The 5th dose of the DTaP series is not required if the 4th dose was given on or after the fourth birthday.^{1, 6, 9}

** While ACIP recommends that the DTaP series be completed with the same brand of DTaP vaccine previously given, Kinrix[®] can be given to complete the DTaP series following the 3rd or 4th dose of any DTaP vaccine or any DTaP-containing combination vaccine previously administered.¹¹

◊◊ Must be given at <7 years of age.^{1, 6, 11}

§§ If the 3rd dose of an all-IPV or an all-OPV series is given on or after the 4th birthday, the IPV series is complete.¹¹

‡‡ For retrospective checking, doses that violate the minimum spacing or age by 4 or fewer days do not need to be repeated. Doses administered 5 days or earlier than the minimum interval or age should be repeated, as appropriate for age.⁸

IV. CONTRAINDICATIONS

- Quadracel^{®1}, Pediarix^{®2}, Pentacel^{®3}, Daptacel^{®4}, Infanrix^{®5}, Kinrix^{®6, 17}:
 - Severe allergic reaction (e.g., anaphylaxis) to any ingredient or following any diphtheria toxoid, tetanus toxoid, pertussis-containing vaccine or inactivated poliovirus vaccine.
 - Encephalopathy (e.g., coma, decreased level of consciousness and prolonged seizures) not attributable to another identifiable cause within 7 days of a previous pertussis-containing vaccine.
 - Progressive neurologic disorder, including infantile spasms, uncontrolled epilepsy, progressive encephalopathy, until a treatment regimen has been established and the condition has stabilized.

V. PRECAUTIONS

- Quadracel^{®1}, Pediarix^{®2}, Pentacel^{®3}, Daptacel^{®4}, Infanrix^{®5}, Kinrix^{®6, 16}:
 - Moderate or severe acute illness with or without fever.
 - Guillain-Barré syndrome (GBS) within 6 weeks after a previous dose of tetanus toxoid-containing vaccine.
 - History of arthus-type hypersensitivity reactions after a previous dose of tetanus or diphtheria toxoid-containing vaccine; defer vaccination until at least 10 years have elapsed since the last tetanus-toxoid containing vaccine.
 - For pertussis-containing vaccines: progressive or unstable neurologic disorder (including infantile spasms for DTaP), uncontrolled seizures, or progressive encephalopathy until a treatment regimen has been established and the condition has stabilized.
 - Temperature of 105° F or higher (40.5° C or higher) within 48 hours after vaccination with a previous dose of DTP/DTaP.
 - Collapse or shock-like state (i.e., hypotonic hyporesponsive episode) within 48 hours after receiving a previous dose of DTP/DTaP.

- Seizure within 3 days after receiving a previous dose of DTP/DTaP.
- Persistent, inconsolable crying lasting 3 or more hours within 48 hours after receiving a previous dose of DTP/DTaP.
- Syncope (fainting) can occur in association with administration of injectable vaccines, Procedures should be in place to avoid falling injury and to restore cerebral perfusion following syncope.
- Apnea following intramuscular vaccination has been observed in some infants born prematurely. Decisions about when to administer an intramuscular vaccine, to infants born prematurely should be based on consideration of the individual infant’s medical status, and the potential benefits and possible risks of vaccination.
- Pentacel[®] 3 : Daptacel[®] 4 : Quadracel:
 - If vaccine is administered to immunocompromised persons, including persons receiving immunosuppressive therapy, the expected immune response may not be obtained.
- Pediarix[®] 2 : Infanrix[®] 5 : Kinrix[®] 6
 - The tip caps of the prefilled syringes may contain natural rubber latex which may cause allergic reactions in latex-sensitive individuals.
- Pediarix[®] 2
 - In clinical trials, was associated with higher rates of fever, relative to separately administered vaccines.

Note:

- An acellular pertussis vaccine should NOT be used in children who have a valid contraindication to whole-cell pertussis vaccine.²
- After consulting with your Health Officer or client’s Primary Care Provider, give DT vaccine for the remaining doses to those with a medical contraindication to pertussis vaccine.⁴
- Because of the importance of the tetanus vaccine, persons who experience anaphylactic reactions to tetanus toxoid may be referred to an allergist for evaluation and possible desensitization.⁸

VI. ADVERSE REACTIONS FROM DIPHTHERIA, PERTUSSIS OR TETANUS TOXOID-CONTAINING VACCINES

Summary from package inserts.^{1, 2, 3, 6}

Local reaction, injection site	
Pain Redness Swelling Induration	More common following the 4 th or 5 th doses <ul style="list-style-type: none"> • 9.7—56.1% after 4th dose of Pentacel[®]◇ • 14—61.1% after 3rd dose of Pediarix[®]§ • 40—77% with Quadracel[®], ** with concomitant MMR and Varicella
More exaggerated arthus—like reaction *	Occasionally (most often in adults)
Mild systemic complaints	
Fever Drowsiness Fretfulness	Occasionally (most often in adults)
Anorexia	<ul style="list-style-type: none"> • 26.1% with Pediarix[®] • 15.5% with Kinrix[®]
Temp ≥100° F (38°C)	<ul style="list-style-type: none"> • 6.5% with Kinrix[®]‡ • 5.8—16.3% with Pentacel[®]◇ • 2.3—23.8% with Pediarix[®], with concomitant Hib and PCV vaccines § • 1.3—6% with Quadracel[®]**
Moderate to severe systemic reactions	
Fever ≥105°F (40°C) or febrile seizures	<ul style="list-style-type: none"> • Rarely reported with DTaP vaccines

* Symptoms present as extensive painful swelling, often from shoulder to elbow; they generally begin 2–8 hours after injection and are usually due to the presence of very high serum antitoxin levels in persons who have received frequent doses of diphtheria or tetanus toxoid.

◇ Pentacel[®] 2013 package insert, Table 2, page 12.³

§ Pediarix[®] 2013 package insert, Table 1, page 7.²

‡ Kinrix[®] 2014 package insert, Table 1, page 5.⁶

** Quadracel[®] 2015 package insert, Table 1, page 7.¹

VII. OTHER CONSIDERATIONS

1. Epinephrine hydrochloride solution (1:1,000) and other appropriate agents and equipment must be available for immediate use in case an anaphylactic or acute hypersensitivity reaction occurs.^{1, 2, 3, 6, 8}
2. Evidence does not support use of antipyretics before or at the time of vaccination; however, they can be used for the treatment of fever and local discomfort that might occur following vaccination. Studies of children with previous febrile seizures have not demonstrated antipyretics to be effective in the prevention of febrile seizures.⁸
3. Normally no more than 6 doses of a diphtheria/tetanus-containing vaccine are recommended by 7 years of age. However, in some situations (local outbreak, unknown vaccination history, from a foreign country), the benefits of a pertussis-containing vaccine being added to a series needs to be weighed against the risk of a local reaction occurring after receiving 7 or 8 doses of a DT-containing vaccine.⁸
4. Infants and children with a stable neurologic condition, including well-controlled seizures, may be given DTaP-containing vaccines. A family history of convulsions is not a contraindication for pertussis-containing vaccines.¹¹
5. Although well-documented pertussis may confer short-term protection against reinfection in children, the duration of such protection is unknown, and completing the DTaP series is recommended regardless of a patient's history of pertussis.¹¹
6. Internationally Adopted Children: Vaccination providers can revaccinate a child with DTaP without regard to recorded doses; however, if a revaccination approach is adopted and a severe local reaction occurs, serologic testing for specific IgG antibody to tetanus and diphtheria toxins can be measured before administering additional doses. A protective concentration indicates that further doses are unnecessary, and subsequent vaccination should occur as appropriate for age.^{8, 11}
7. Partial doses of DTaP should not be given to pre-term infants or any other child in an effort to avoid adverse reactions, because antibody response may be inadequate.^{8, 11}
8. DTaP given to patients age 7 or older can be counted as valid for the one-time Tdap dose.^{8, 17}

9. For someone with a history of fainting with injections, a 15-minute observational period is recommended after immunization.^{8, 11}

VIII. A. TETANUS WOUND^{*} MANAGEMENT RECOMMENDATIONS FOR CHILDREN ≤6 YEARS OF AGE^{12, 19}

Vaccination History	Clean, minor wounds		All other wounds	
	DT	TIG [◇]	DT	TIG
Unknown or less than 3 doses	Yes	No	Yes	Yes
3 or more doses [§]	No	No	No [‡]	No

^{*} Such as, but not limited to, wounds contaminated with dirt, feces, soil, and saliva; puncture wounds; avulsions; and wounds resulting from missiles, crushing, burns or frostbite.¹⁹

[◇] TIG = tetanus immune globulin

[§] See Tdap order for individuals ≥7 years of age.

[‡] Yes, if >5 years since last tetanus-containing dose.

IX. STORAGE AND HANDLING

All clinics and pharmacies enrolled with the VFC program must immediately report any storage and handling deviations to their health educator. The Health Educator assignment map is located at: http://bit.ly/HE_Map

1. Quadracel[®]: Pediarix[®]: Pentacel[®]: Daptacel[®]: Infanrix[®]: Kinrix[®]: Store at 2° to 8°C (35° to 46°F). Do not freeze. Product which has been exposed to freezing should not be used.^{1, 2, 3, 4, 5, 6}
2. Quadracel¹: Pentacel[®]: Daptacel[®]: Do not use after expiration date shown on the label.^{1, 3, 4}
3. Pentacel[®] vaccine should be used immediately after reconstitution.³

X. A. VAERS Table of Reportable Events Following Vaccination *

Vaccine/Toxoid	Event and interval from vaccination
Tetanus in any combination; DTaP, DTP, DTP-Hib, DT, Td, TT, Tdap, DTaP-IPV, DTaP-IPV/Hib, DTaPHepB- IPV	A. Anaphylaxis or anaphylactic shock (7 days) B. Brachial neuritis (28 days) C. Any acute complications or sequelae (including death) of above events (interval - not applicable) D. Events described in manufacturer’s package insert as contraindications to additional doses of vaccine (interval- see package insert)
Pertussis in any combination; DTaP, DTP, DTPHib, Tdap, P, DTaP-IPV, DTaP- IPV/Hib, DTaPHepB- IPV	A. Anaphylaxis or anaphylactic shock (7 days) B. Encephalopathy or encephalitis (7 days) C. Any acute complications or sequelae (including death) of above events (interval - not applicable) D. Events described in manufacturer’s package insert as contraindications to additional doses of vaccine (interval- see package insert)

* **Effective date: November 10, 2008.** The Reportable Events Table (RET) reflects what is reportable by law (42 USC 300aa-25) to the Vaccine Adverse Event Reporting System (VAERS) including conditions found in the manufacturers package insert. Manufacturers are required by regulation (21CFR 600.80) to report to the VAERS program all adverse events made known to them for any vaccine.

[vaers.hhs.gov/resources/VAERS Table of Reportable Events Following Vaccination.pdf](http://vaers.hhs.gov/resources/VAERS%20Table%20of%20Reportable%20Events%20Following%20Vaccination.pdf)

X.ADVERSE EVENTS REPORTING

Public providers are to complete the Vaccine Adverse Events Reporting System (VAERS) report online at <https://vaers.hhs.gov/esub/step1>. Save a copy of the report number for your records, and send a copy and the report number to the Oregon Immunization Program Vaccine Safety Coordinator via confidential email (carol.l.easter@state.or.us) or fax (971-673-0278). Private providers are to report events directly to VAERS and can read about options on how to do so at www.vaers.hhs.gov.

To request this material in an alternative format (e.g., Braille) or to clarify any part of the above order, contact the Oregon Health Authority Immunization Program at 971.673.0300 and 711 for TTY. For other questions, consult with the vaccine recipient's primary health care provider or a consulting physician.

Electronic copy of this standing order is available at:
<http://1.usa.gov/OregonStandingOrders>

REFERENCES

1. Quadracel[®] 2015 package insert. Available at:
<http://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM439903.pdf>. Accessed 10 April 2015.
2. Pediarix[®] 2013 package insert. Available at:
https://www.gsksource.com/pharma/content/dam/GlaxoSmithKline/US/en/Prescribing_Information/Pediarix/pdf/PEDIARIX.PDF . Accessed 24 April 2015
3. Pentacel[®] 2013 package insert. Available at:
<http://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM109810.pdf> . Accessed 24 April 2015
4. Daptacel[®] 2013 package insert. Available at:
<http://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM103037.pdf>. Accessed 10 April 2015.
5. Infanrix[®] 2013 package insert. Available at:
https://www.gsksource.com/pharma/content/dam/GlaxoSmithKline/US/en/Prescribing_Information/Infanrix/pdf/INFANRIX.PDF . Accessed 24 April 2015
6. Kinrix[®] 2014 package insert. Available at:
https://www.gsksource.com/pharma/content/dam/GlaxoSmithKline/US/en/Prescribing_Information/Kinrix/pdf/KINRIX.PDF . Accessed 24 April 2015.
7. CDC. FDA approval of diphtheria and tetanus toxoids and acellular pertussis vaccine adsorbed, (Infanrix[®]) for fifth consecutive DTaP vaccine dose. MMWR 2003; 52 (38) p.921. Available at: <http://www.cdc.gov/mmwr/pdf/wk/mm5238.pdf>. Accessed 10 April 2015.
8. CDC. General Recommendations on Immunizations. Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2011; 60 (RR-2). Available at: www.cdc.gov/mmwr/pdf/rr/rr6002.pdf. Accessed 24 April 2015.

9. CDC. Licensure of a diphtheria and tetanus toxoids and acellular pertussis adsorbed and inactivated poliovirus vaccine and guidance for use as a booster dose (Kinrix[®]). MMWR 2008; 57 (39):1078–9. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/mm5739a4.htm. Accessed 10 April 2015.
10. Tetanus & Pertussis. In: Pickering LK, Baker CJ, Long SS, McMillan JA, eds. Red Book: 2012 Report of the Committee on Infectious Diseases. 28th ed. Elk Grove Village, IL; American Academy of Pediatrics; 2012: 215–32 and 2012:710. Web site requires a fee.
11. Pertussis. In: Epidemiology and Prevention of Vaccine-Preventable Diseases (“Pink Book”). Atkinson W, Hamborsky J, Wolfe S, eds. 12th ed. Washington, DC: Public Health Foundation, 2012: 215–32. Available at: www.cdc.gov/vaccines/pubs/pinkbook/downloads/pert.pdf. Accessed 10 April 2015.
12. Tetanus. In: Epidemiology and Prevention of Vaccine-Preventable Diseases (“Pink Book”). Atkinson W, Hamborsky J, Wolfe S, eds. 12th ed. Washington, DC: Public Health Foundation, 2012: 291–300. Available at: <http://www.cdc.gov/vaccines/pubs/pinkbook/tetanus.html> . Accessed 24 April 2015.
13. CDC. Updated recommendations for use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis (Tdap) vaccine from the Advisory Committee on Immunization Practices, 2010. MMWR 2011; 60:13–5. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/mm6001a4.htm?s_cid=mm6001a4_w . Accessed 14 October 2014.
14. CDC. Licensure of a diphtheria and tetanus toxoids and acellular pertussis adsorbed and inactivated poliovirus vaccine and guidance for use as a booster dose. MMWR 2008; 57 (39):1078–9. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/mm5739a4.htm. Accessed 14 October 2014.
15. Vaccine Adverse Events Reporting System (VAERS). Table of reportable events following vaccination. Available at: https://vaers.hhs.gov/resources/VAERS_Table_of_Reportable_Events_Following_Vaccination.pdf . Accessed 18 November 2014.

16. CDC. Contraindications and Precautions to Immunizations. 2015. Available at: <http://www.cdc.gov/vaccines/recs/vac-admin/contraindications-vacc.htm>. Accessed 20 April 2015.
17. Immunization Action Coalition. Ask the experts: Diphtheria, Tetanus, Pertussis. Available at: http://www.immunize.org/askexperts/experts_per.asp . Accessed 24, April 2015.
18. CDC. Preventing tetanus, diphtheria, and pertussis among adults: Use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccine. Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2006;55(RR17);1—33. Available at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5517a1.htm> . Accessed 24 April 2015.
19. Tiwari, T. VPD Surveillance Manual, 5th Edition, 2011. Tetanus: Chapter 16. Table 1. Guide to tetanus prophylaxis in routine wound management. CDC. 2014. Available at: <http://www.cdc.gov/vaccines/pubs/surv-manual/chpt16-tetanus.html> . Accessed 24 April, 2015.

APPENDIX:

Tetanus containing vaccines; total antigen
DTaP, DT, TT, Td, and Tdap.

Pertussis Components

Antigens	P/ A	Tetanus Toxoid	Diphtheria Toxoid	PT	FHA	Pertactin	Fimbriae types 2, 3
Daptacel ¹ Sanofi	P	5 Lf	15 Lf	10mcg	5mcg	3 mcg	5mcg
Pentacel ² Sanofi	P	5 Lf	15 Lf	20mcg	20mcg	3mcg	5mcg
Quadracel ³ Sanofi	P	5 Lf	15 Lf	20 mcg	20 mcg	3mcg	5mcg
TT (DT) ⁴ Sanofi	P	5 Lf	25 LF				
Infanrix ⁵ GSK	P	10 Lf	25 Lf	25mcg	25mcg	8 mcg	
Pediarix ⁶ GSK	P	10 Lf	25 Lf	25mcg	25mcg	8 mcg	
Kinrix ⁷ GSK	P	10 Lf	25 Lf	25mcg	25mcg	8 mcg	
DT ⁸ Sanofi	P	6.7 Lf	5 Lf				
TT ⁹ Sanofi	A	4Lf					
Td ¹⁰ Mass Bio	A	2 Lf	2Lf				
Decavac ¹¹ Sanofi	A	5 Lf	2Lf				
Tenavac ¹² Sanofi	A	5 Lf	2Lf				
Adacel ¹³ Sanofi	A	5 Lf	2 Lf	2.5mcg	5mcg	3mcg	5 mcg
Boostrix ¹⁴ GSK	A	5 Lf	2.5Lf	8mcg	8 mcg	2.5 mcg	

P = Pediatric

A = Adult

PT = Detoxified Pertussis Toxin

FHA = Filamentous Hemagglutinin

REFERENCES FOR APPENDIX:

1. Daptacel[®] (Diphtheria and Tetanus Toxoids and Acellular Pertussis Vaccine Adsorbed). 2013. Available at <http://www.fda.gov/BiologicsBloodVaccines/Vaccines/ApprovedProducts/ucm101572.htm> . Accessed 12 January 2015.
2. Pentacel[®] (Diphtheria and Tetanus Toxoids and Acellular Pertussis Adsorbed, Inactivated Poliovirus and haemophilus b Conjugate (Tetanus Toxoid Conjugate) Vaccine. Available at <http://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM109810.pdf> . Accessed 12 January 2015.
3. Quadracel[®] (Diphtheria, Tetanus Toxoid, Acellular Pertussis, Inactivated polio virus. Sanofi Pasteur, 2015. Available at: <http://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM439903.pdf> . Accessed 29 April 2015.
4. Tetanus Toxoid[®] . (Diphtheria and Tetanus Toxoids Adsorbed). No Trade Name. Sanofi. 2013. Available at <http://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM142732.pdf> . Accessed 12, January 2015.
5. Infanrix[®] (Diphtheria and Tetanus Toxoids and Acellular Pertussis Vaccine Adsorbed). 2013. Available at: <http://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM124514.pdf> . 29 April 2015.
6. Pediarix[®] (Diphtheria and Tetanus Toxoids and Acellular Pertussis Adsorbed, Hepatitis B (Recombinant) and Inactivated Poliovirus Vaccine). 2013. Available at <http://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM241874.pdf> . Accessed 12 January 2015.
7. Kinrix[®] (Diphtheria and Tetanus Toxoids and Acellular Pertussis Adsorbed and Inactivated Poliovirus Vaccine). 2014. Available at

<http://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM241453.pdf> . Accessed 12 January 2015

8. Diphtheria and Tetanus Toxoids Adsorbed[®] USP (For Pediatric Use). 2005. Available at <http://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM101500.pdf> . Accessed 12 January 2015.

9. Tetanus Toxoid[®] For Booster Use Only (Tetanus Toxoid). Sanofi. 2005. Available at <http://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM166873.pdf> . Accessed 12 January 2015.

10. Tetanus and Diphtheria Toxoids Adsorbed[®] (no trade name). Mass Biologics. 2014. Available at <http://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM164127.pdf> . Accessed 12, January 2015.

11. Decavac[®] (Tetanus and Diphtheria Toxoids Adsorbed). Sanofi. 2011. Available at <http://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM246215.pdf> . Accessed 12, January 2015.

12. Tenivac[®] (Tetanus and Diphtheria Toxoids Adsorbed). Sanofi. 2013. Available at <http://www.fda.gov/downloads/BiologicsBloodVaccines/UCM152826.pdf> . Accessed 12 January 2015.

13. Adacel[®] (Tetanus Toxoid, Reduced Diphtheria Toxoid and Acellular Pertussis Vaccine Adsorbed). Sanofi. 2014. Available at <http://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM142764.pdf> . Accessed 12 January, 2015.

14. Boostrix[®] (Tetanus Toxoid, Reduced Diphtheria Toxoid and Acellular Pertussis Vaccine, Adsorbed). Glaxo Smith Kline, 2013. Available at <http://www.fda.gov/downloads/BiologicsBloodVaccines/UCM152842.pdf> . Accessed 12 January 2015.