



DTaP/DT and Tdap/Td Vaccines

Pink Book Web-on-Demand Series

August 9, 2022

Neil Chandra Murthy, MD, MPH, MSJ

LCDR, U.S. Public Health Service

NCIRD, CDC

Learning Objectives

- Describe the Advisory Committee on Immunization Practices General Best Practice Guidelines on Immunization.
- Describe an emerging immunization issue.
- For each vaccine-preventable disease, identify those for whom routine immunization is recommended.
- For each vaccine-preventable disease, describe characteristics of the vaccine used to prevent the disease.
- Locate current immunization resources to increase knowledge of team's role in program implementation for improved team performance.
- Implement disease detection and prevention health care services (e.g., smoking cessation, weight reduction, diabetes screening, blood pressure screening, immunization services) to prevent health problems and maintain health.

Continuing Education Information

- CE credit, go to: <https://tceols.cdc.gov/>
- Search course number: WD4564-080922
- CE credit expires: July 1, 2024
- CE instructions are available on the Pink Book Web-on-Demand Series web page
- Questions and additional help with the online CE system, e-mail CE@cdc.gov

The screenshot shows the homepage of the Training and Continuing Education Online (TCEO) system. At the top, there is a blue header with the text "Training and Continuing Education Online (TCEO)". Below this is the TCEO logo, which consists of the letters "TCEO" in a bold, blue font with a green circular arrow icon to the right. Underneath the logo, the text "TRAINING AND CONTINUING EDUCATION ONLINE" is displayed in a smaller, blue font. On the left side of the page, there is a vertical navigation menu with several blue buttons: "TCEO Home", "Search Courses", "Create Account", "9 Simple Steps to Earn CE", "Frequently Asked Questions", and "Contact TCEO". The main content area on the right has a blue header with the text "New to TCEO?". Below this header, there are three sections of text: "New to TCEO?" with instructions to visit the "Create Account" page; "Already have a TCEO account from the previous system?" with instructions to sign in and update the account; and "Not sure how to get started?" with instructions to follow the "9 Simple Steps" to earn continuing education. At the bottom of the page, there is a row of four small images: a woman smiling at a child, a man in a suit looking at a screen, a doctor in a white coat holding a dog, and a woman sitting at a desk with a laptop. Below the images, the text "Welcome to TCEO" is displayed, followed by a short paragraph describing the system's purpose: "Training and Continuing Education Online (TCEO) is a system that provides access to CDC educational activities for continuing education (CE). Use TCEO to search for CE opportunities, complete course..."

Disclosure Statements

In compliance with continuing education requirements, all planners and presenters must disclose all financial relationships, in any amount, with ineligible companies during the previous 24 months as well as any use of unlabeled product(s) or products under investigational use.

CDC, our planners, and content experts, wish to disclose they have no financial relationship(s) with ineligible companies whose primary business is producing, marketing, selling, reselling, or distributing healthcare products used by or on patients.

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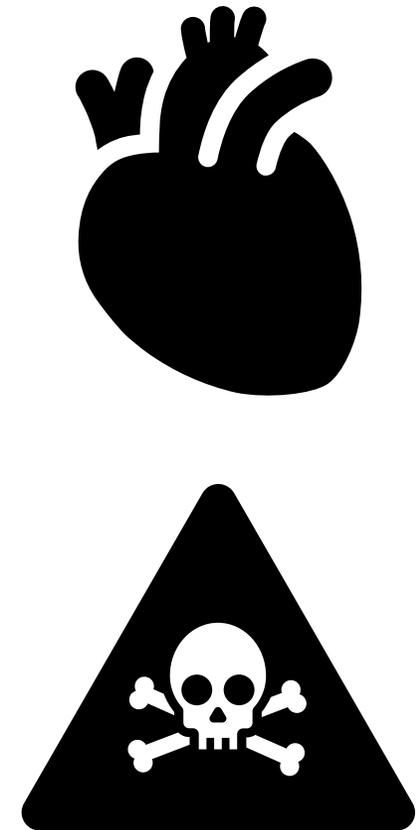
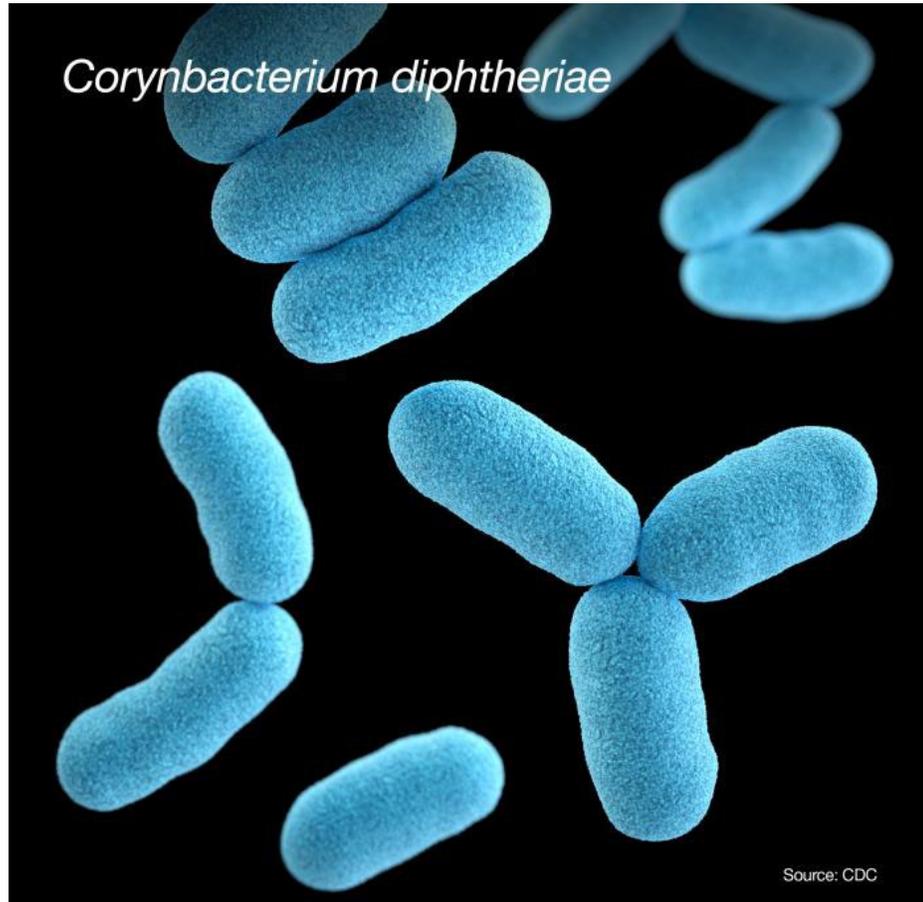
Disclosure Statements

The findings and conclusions in this presentation are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

1

**Diphtheria
Disease**

Diphtheria



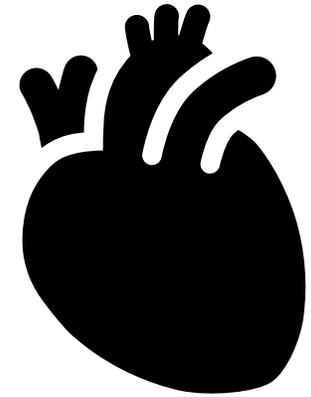
Diphtheria



Diphtheria



Diphtheria



Diphtheria



Diphtheria Clinical Features

- Incubation period: 2–5 days (range: 1–10 days)



Diphtheria Clinical Features

- **May involve any mucous membrane**
- **Classified based on site of disease**
 - Respiratory:
 - Anterior nasal
 - Pharyngeal and tonsillar
 - Laryngeal
 - Cutaneous
 - Otic
 - Other Mucosal Sites:
 - Ocular
 - Genital

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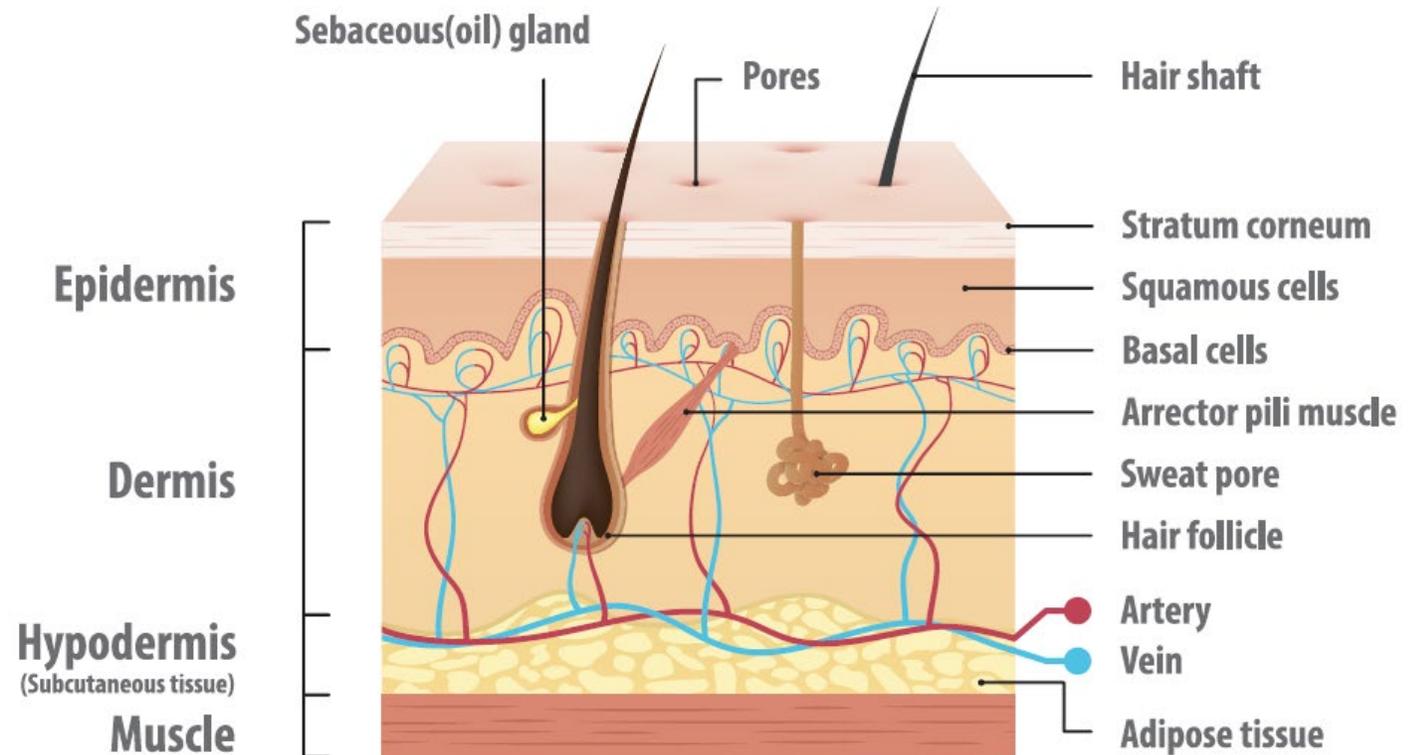
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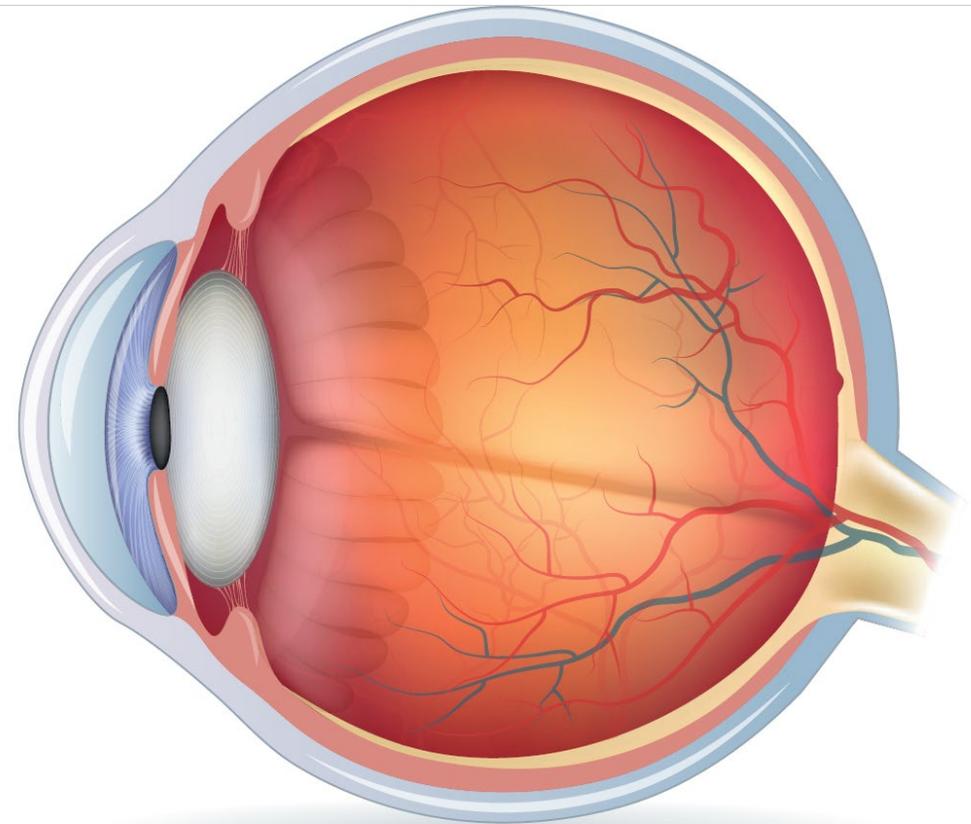
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Diphtheria Clinical Features

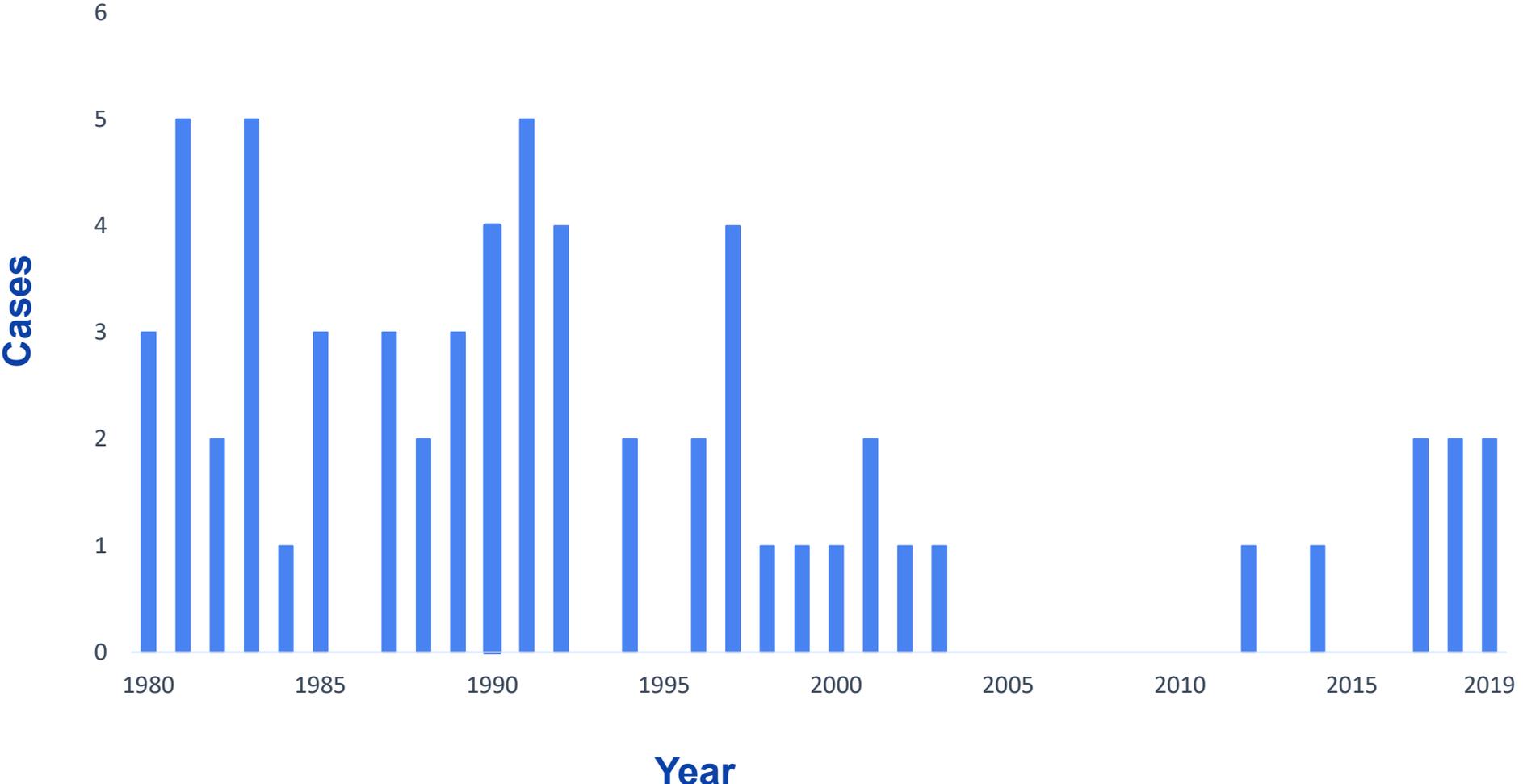
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Diphtheria in the Late 19th–Early 20th Century



Number of Reported Diphtheria Cases — United States, 1980-2019



2

**Tetanus
Disease**

Tetanus



Tetanus



Tetanus



Tetanus

- Two exotoxins produced with growth of bacteria

Tetanolysin

Tetanospasmin

Tetanus

- Two exotoxins produced with growth of bacteria

Tetanolysin

Tetanospasmin

Tetanus

- Two exotoxins produced with growth of bacteria

Tetanolysin

Tetanospasmin



2.5 nanograms per kilogram

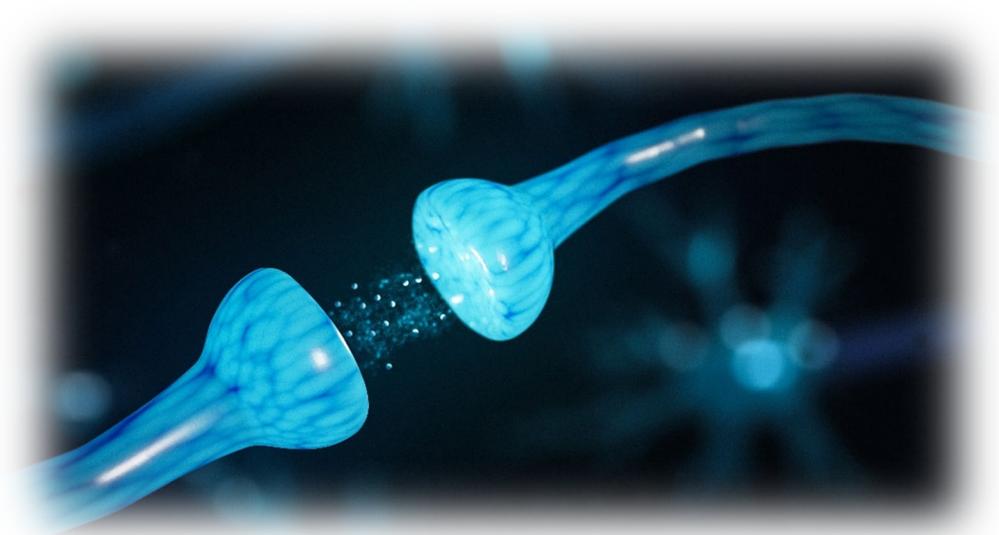
Tetanus Pathophysiology



Tetanus Pathophysiology



Tetanus Pathophysiology



Tetanus Clinical Features

- Incubation period: 8 days (range: 3–21 days)



Tetanus Clinical Features

- Three clinical forms:

Local

Cephalic

Generalized

Tetanus Clinical Features

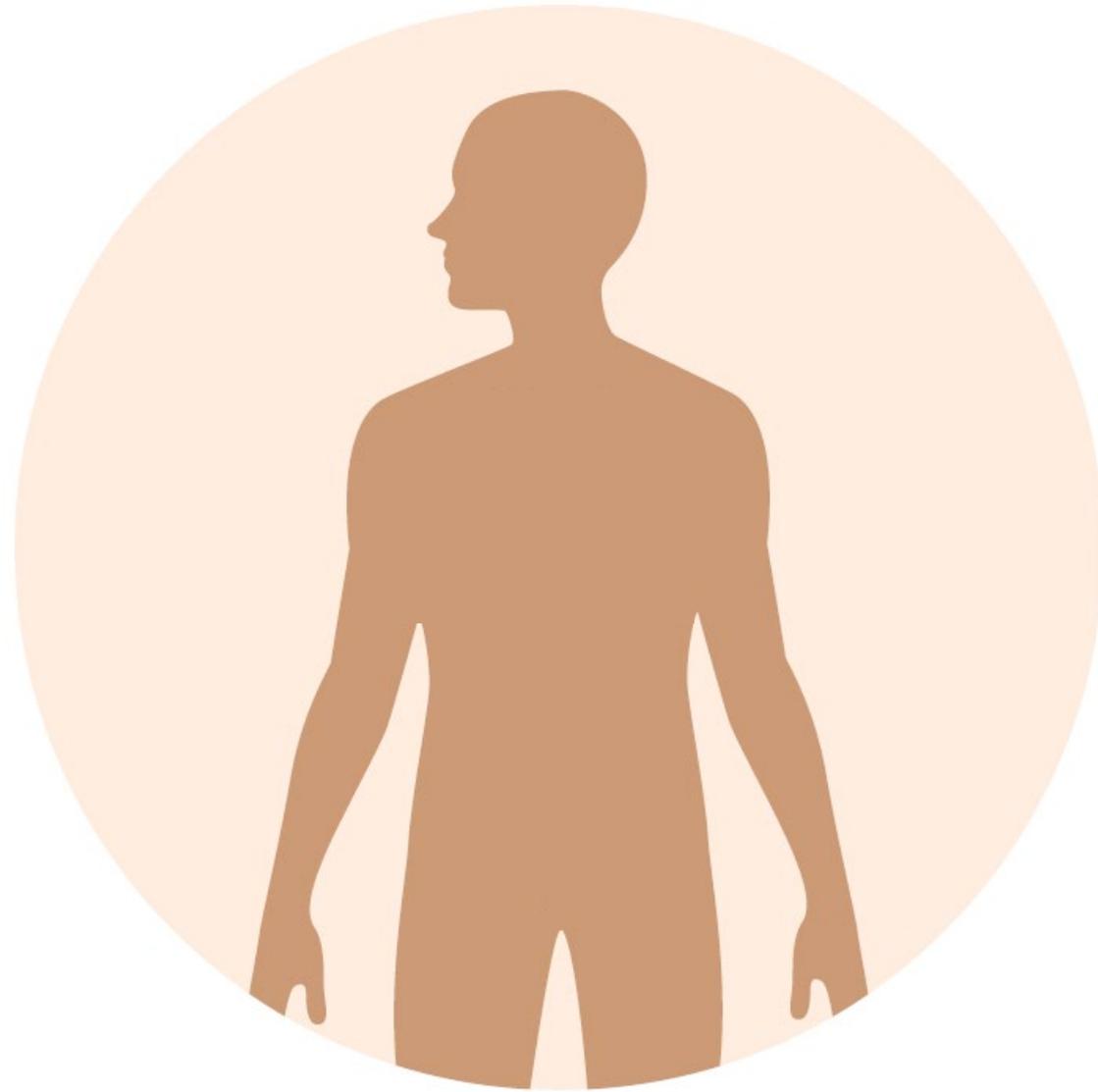
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Local

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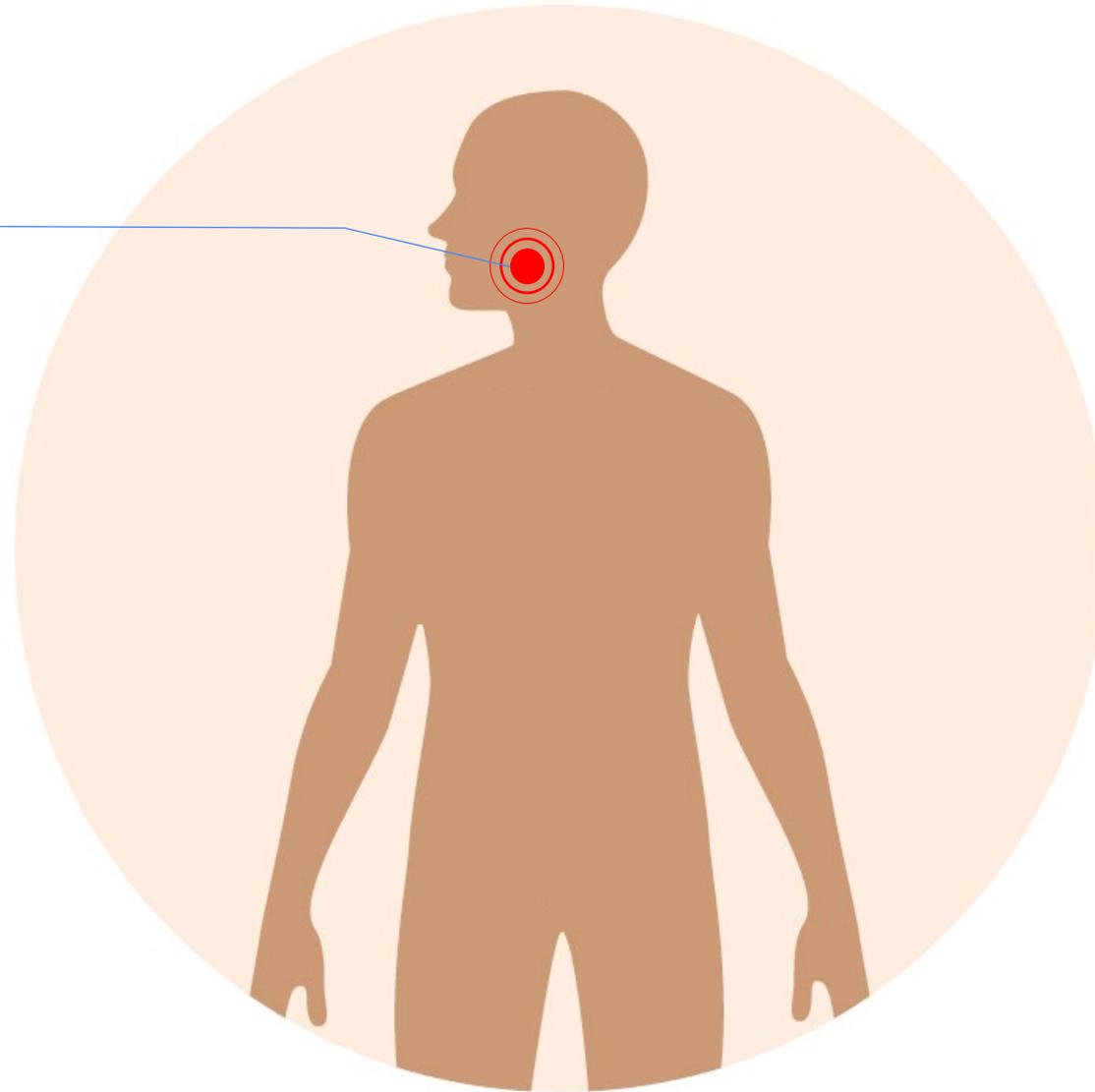
Generalized

Tetanus Clinical Features

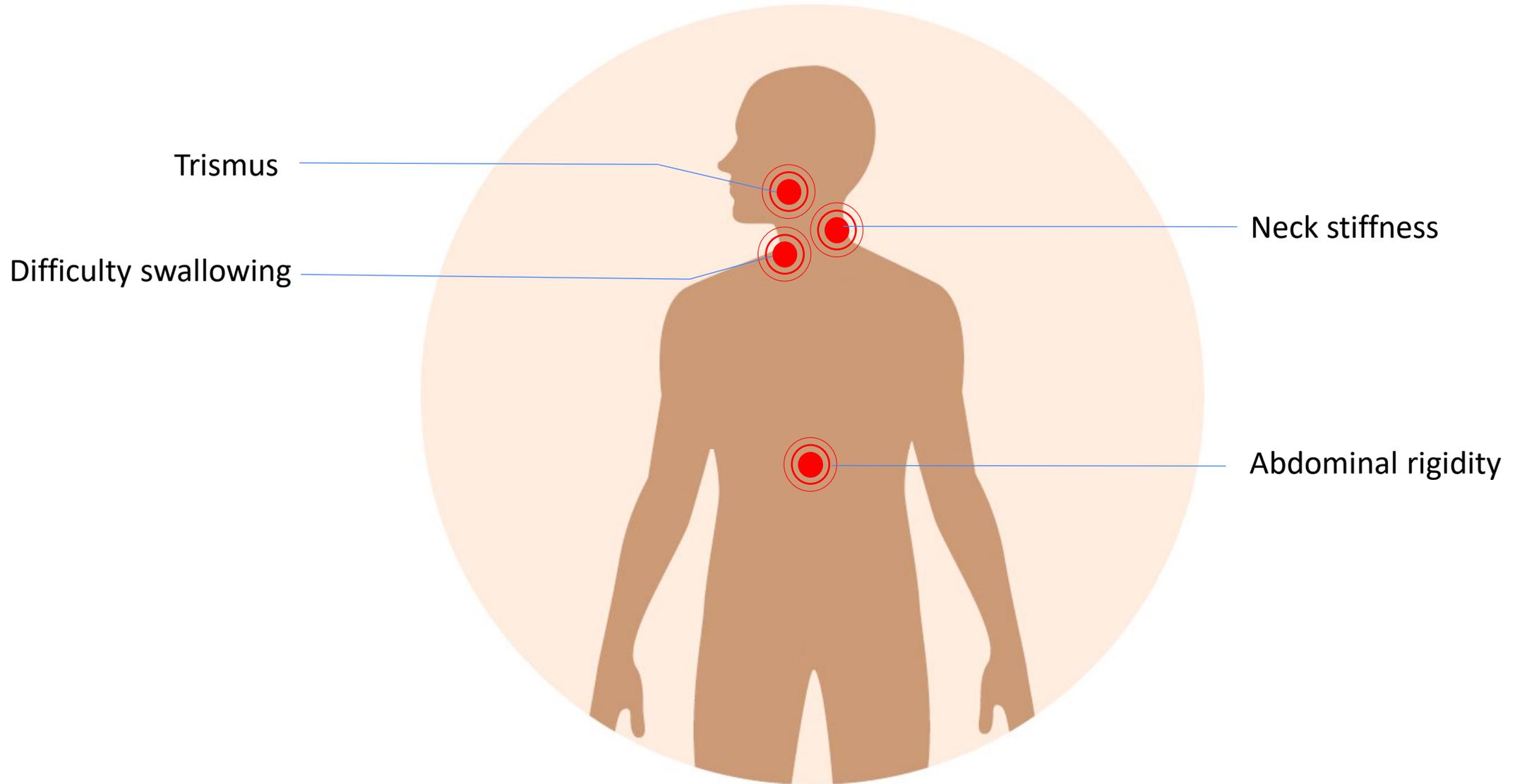


Tetanus Clinical Features

Trismus



Tetanus Clinical Features



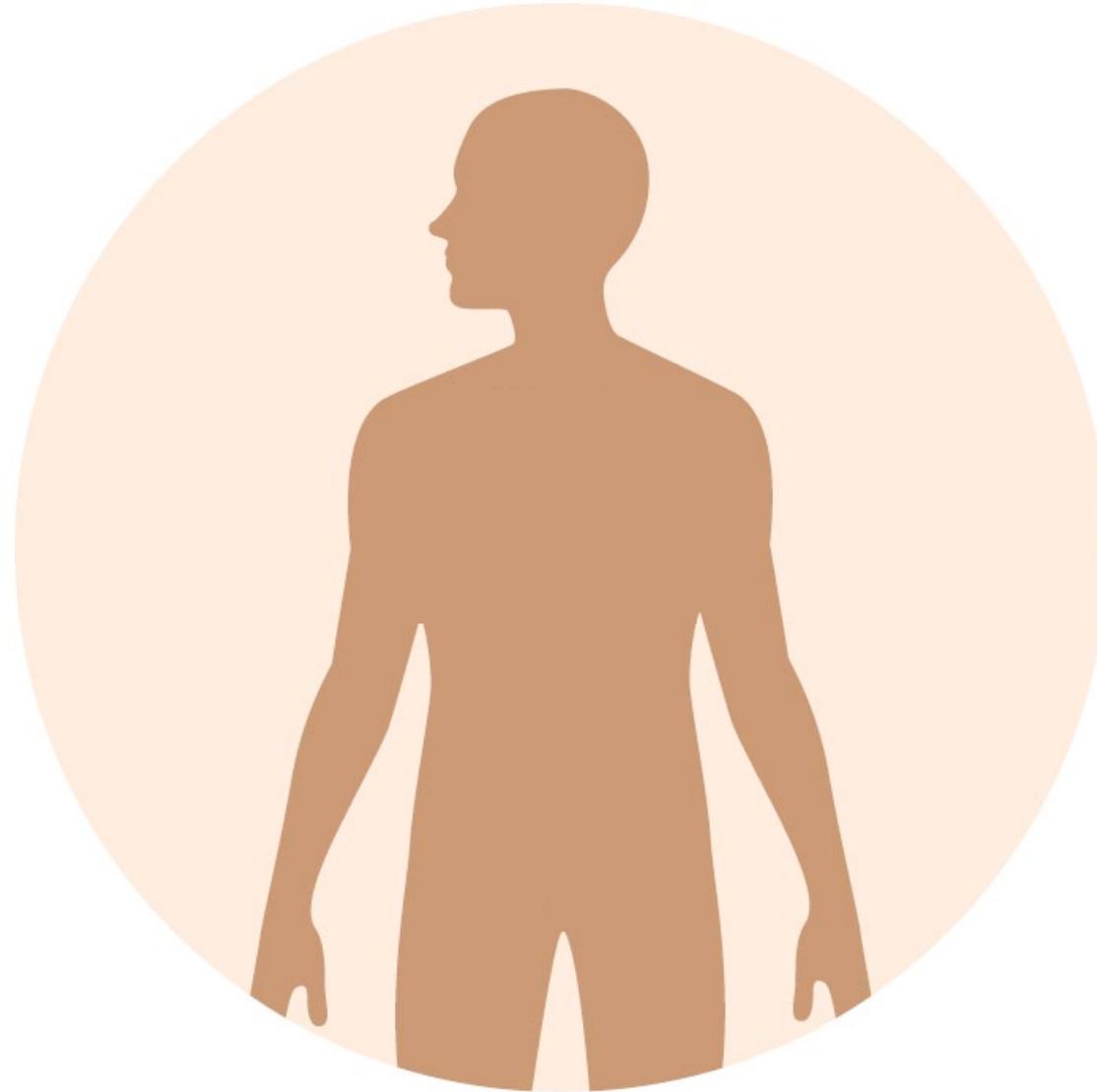
Tetanus Clinical Features



Fever



Diaphoresis



Hypertension



Tachycardia

Tetanus Clinical Features



- **Spasms**
 - Occur frequently and last several minutes
 - Continue for 3–4 weeks
 - Respiratory arrest
 - May break bones
- **Complete recovery may take months**

Tetanus Clinical Features



- **Neonatal tetanus**
 - Generalized tetanus in newborn infant
 - Infant born without protective passive immunity

Morbidity and Mortality Weekly Report (*MMWR*)

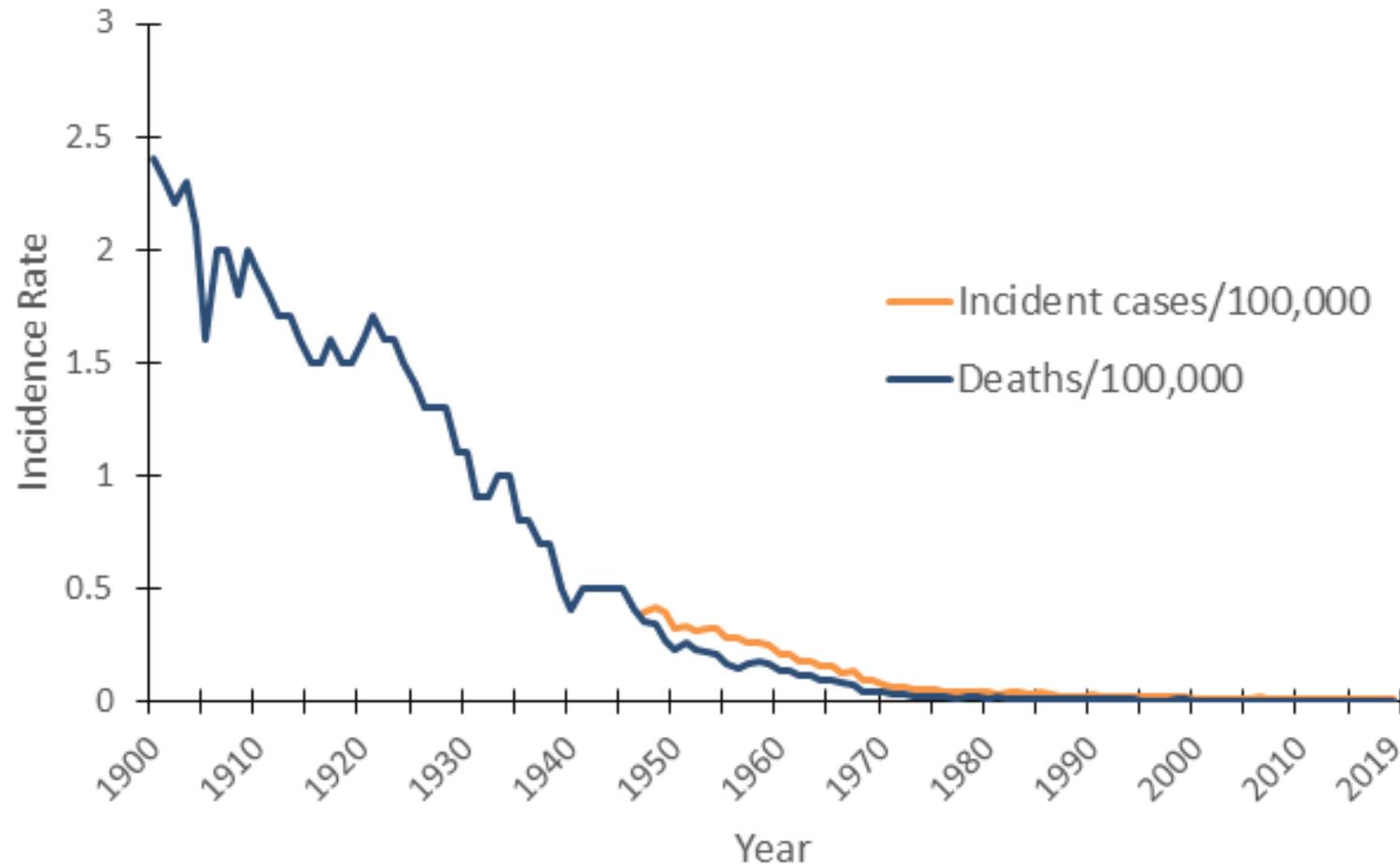
[CDC](#) > [MMWR](#)

Notes from the Field: Tetanus in an Unvaccinated Child – Oregon, 2017

Weekly / March 8, 2019 / 68(9);231–232

- **Required 57 days of inpatient acute care, including 47 days in the intensive care unit**
- **The inpatient charges totaled \$811,929 (excluding air transportation, inpatient rehabilitation, and ambulatory follow-up costs)**

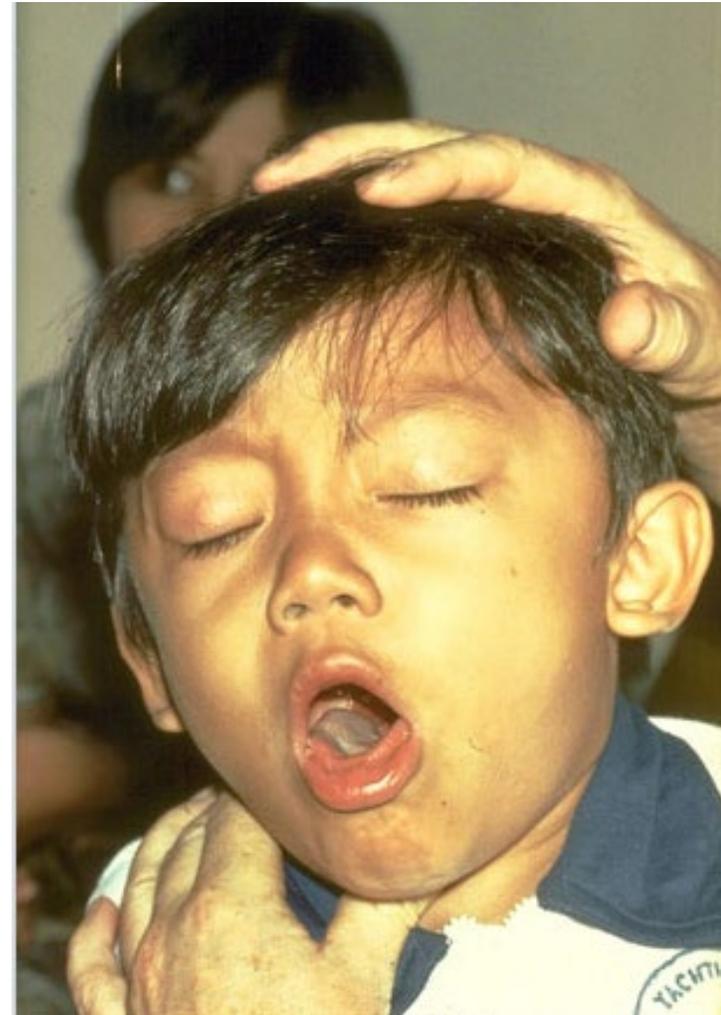
Annual Incidence and Deaths Due to Tetanus — United States, 1900-2019



3

**Pertussis
Disease**

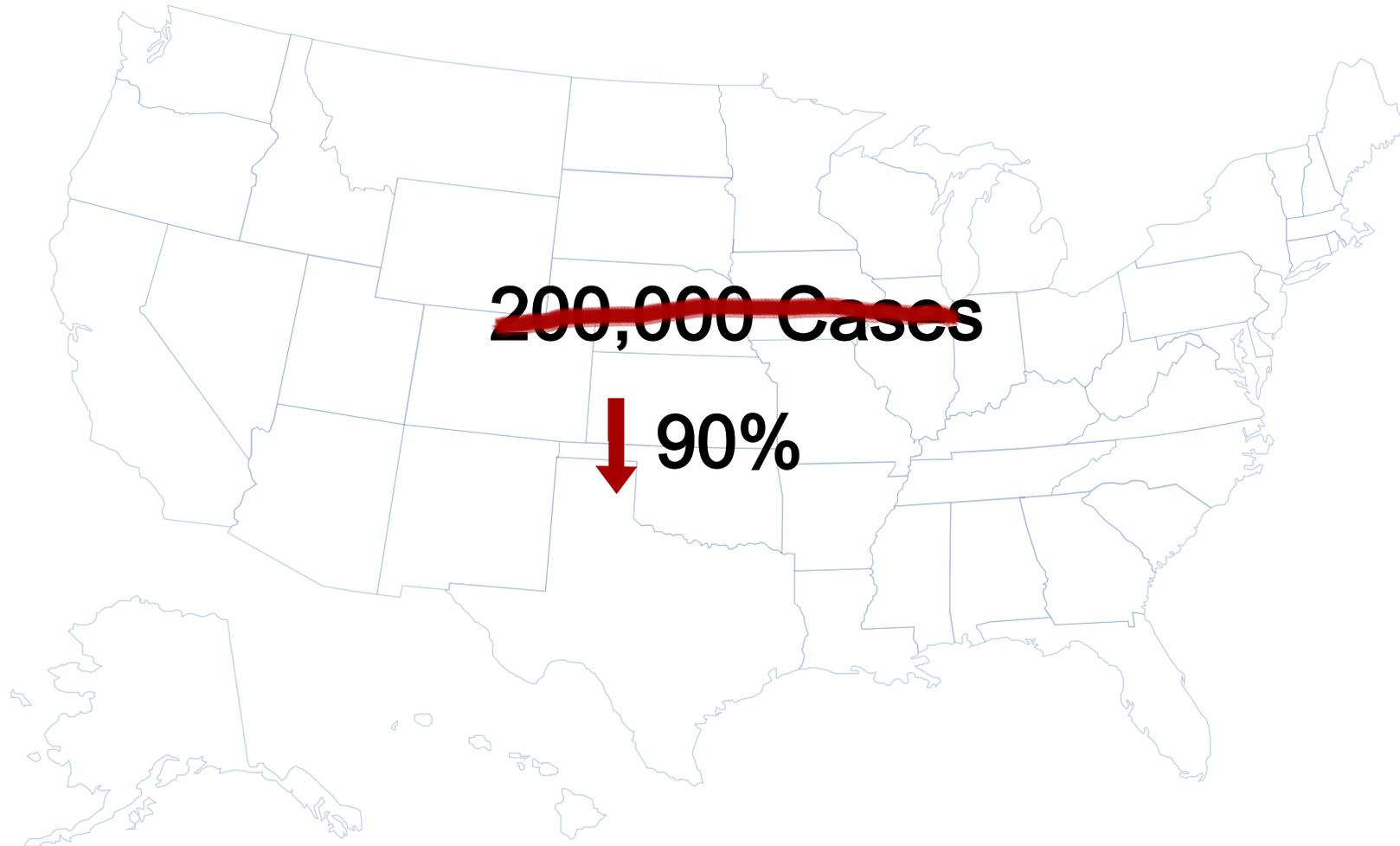
Pertussis



Pertussis



Pertussis



Pertussis



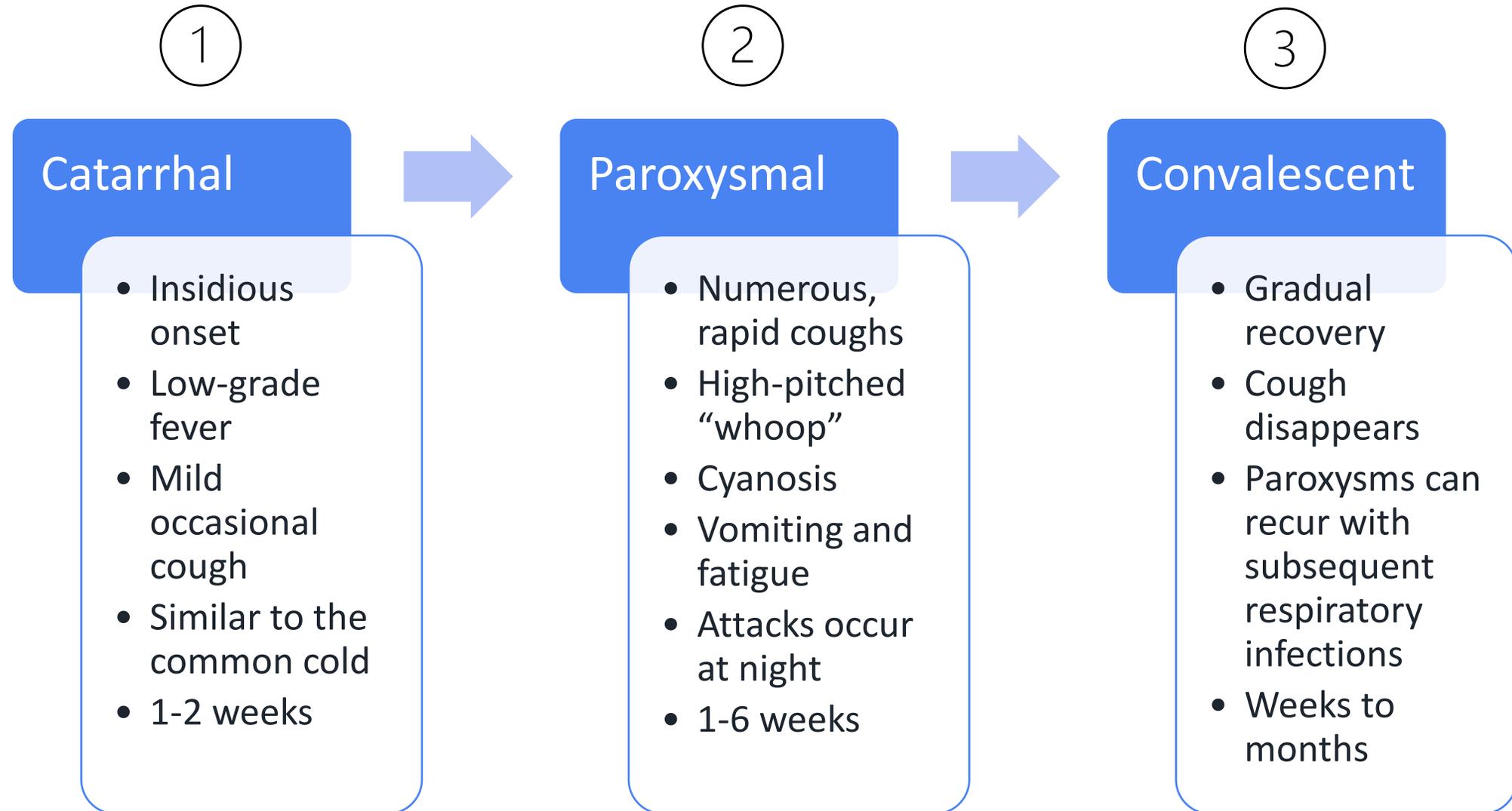
24.1M Cases
160,700 Deaths

Pertussis Clinical Features

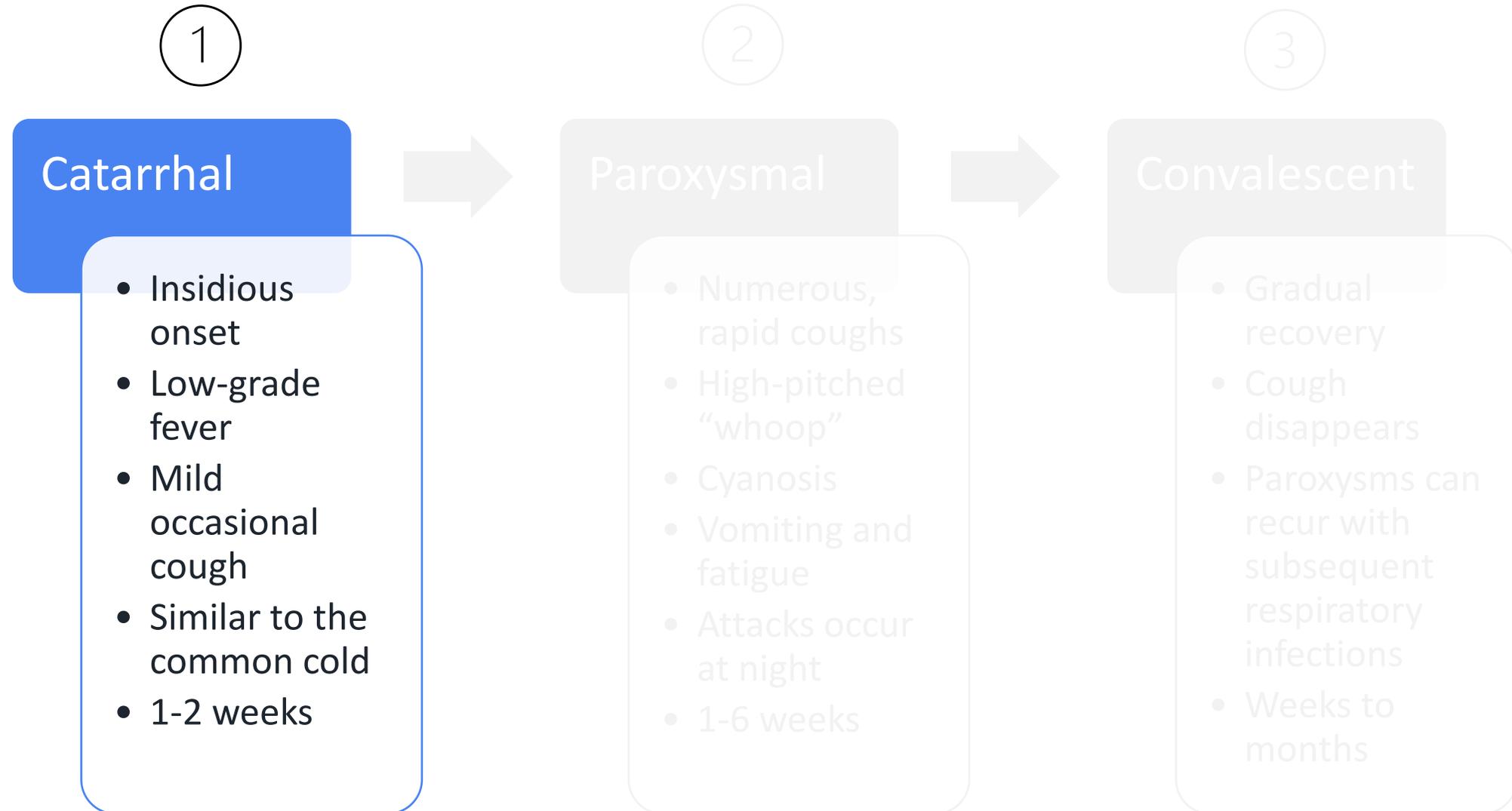
- Incubation period: 7–10 days (range: 4–21 days)



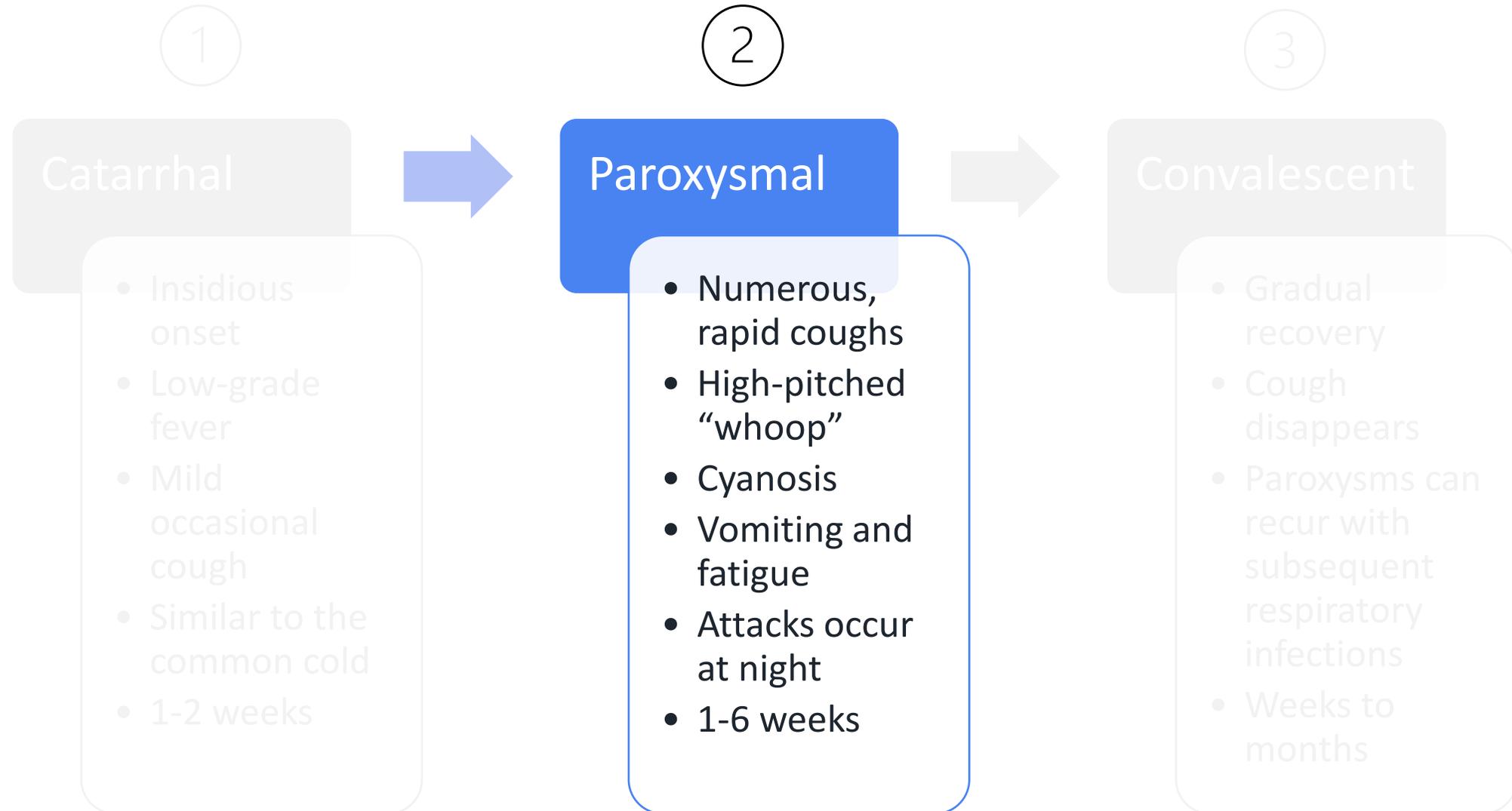
Pertussis Clinical Features



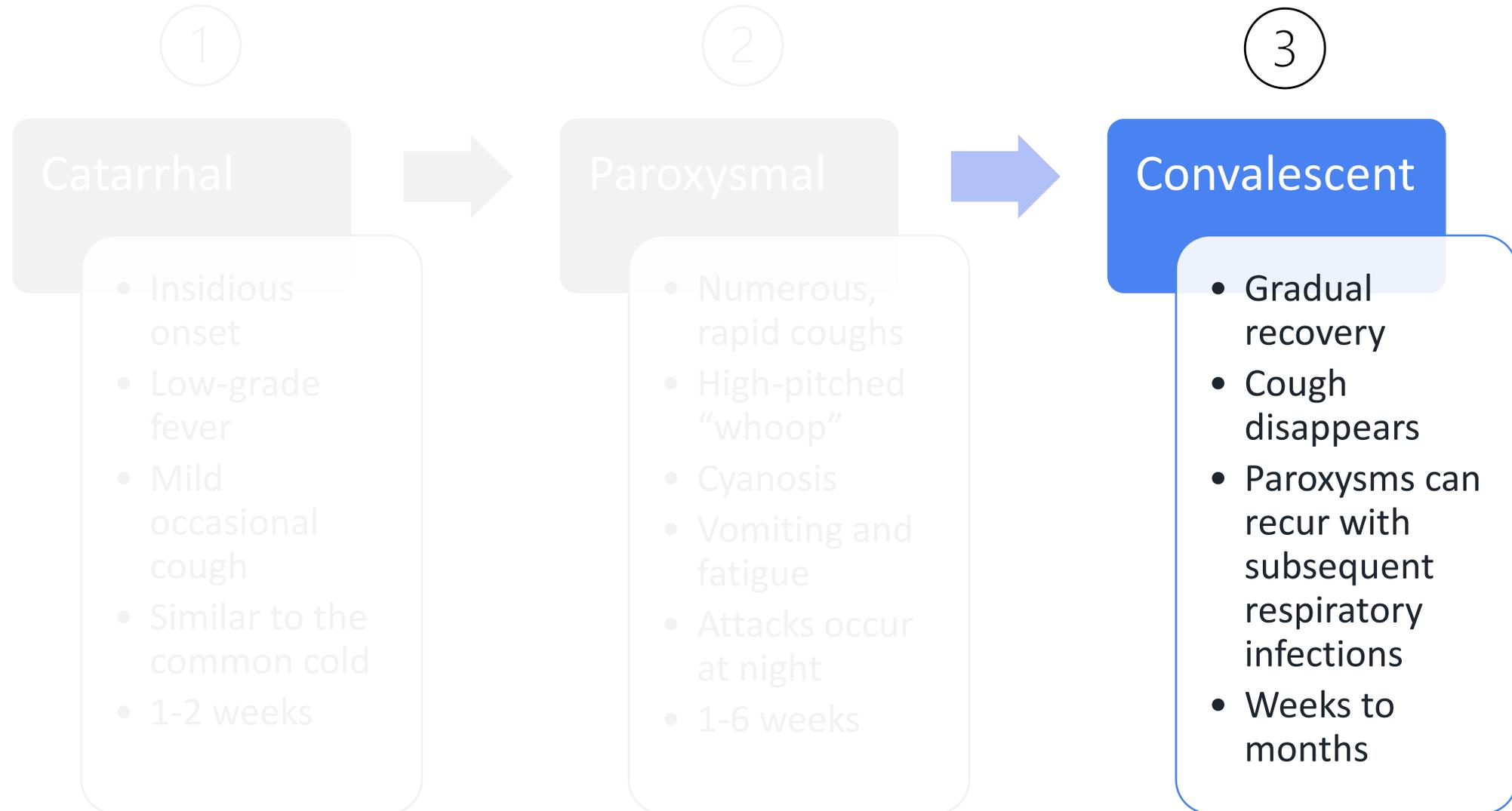
Pertussis Clinical Features



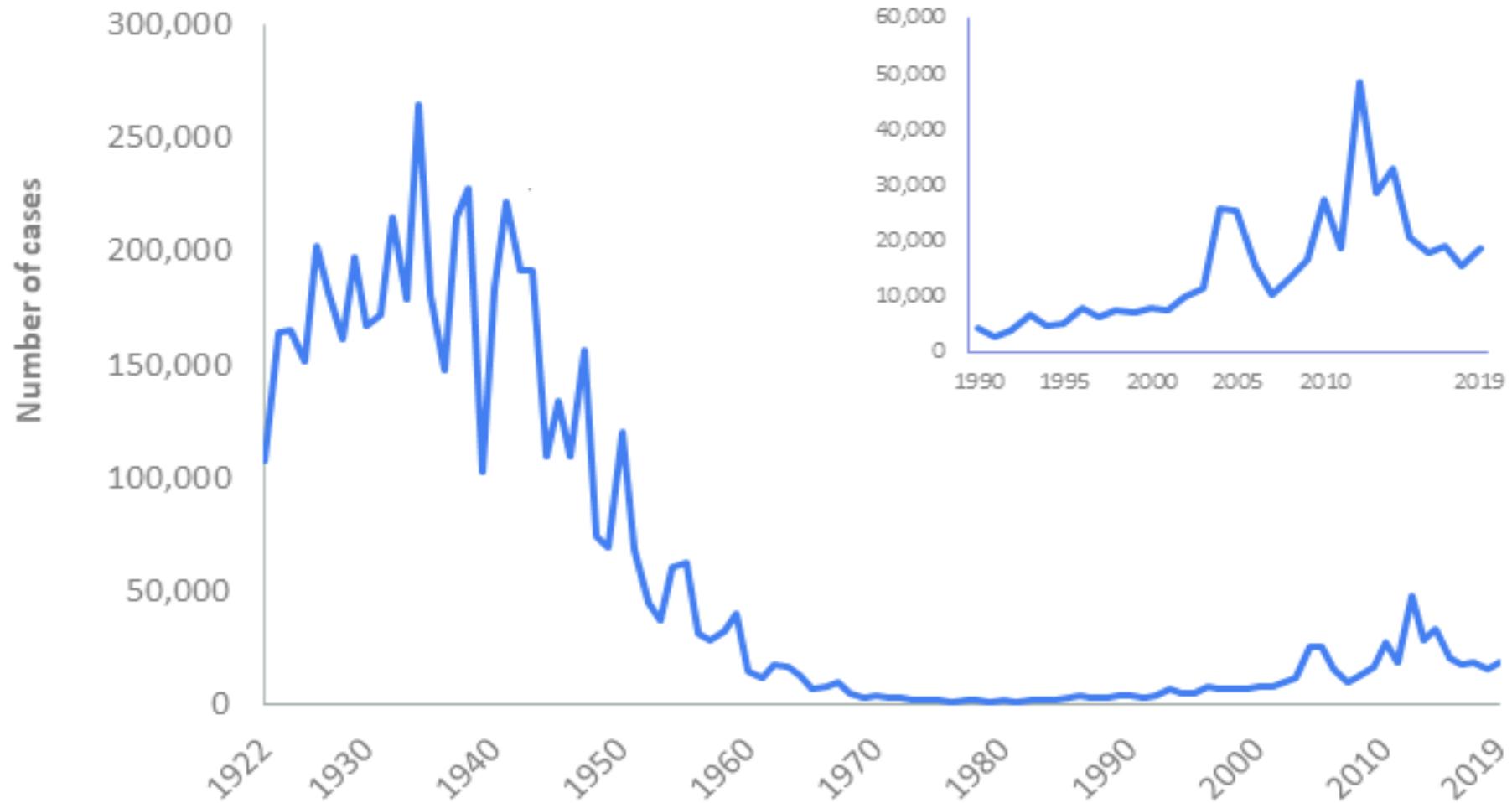
Pertussis Clinical Features



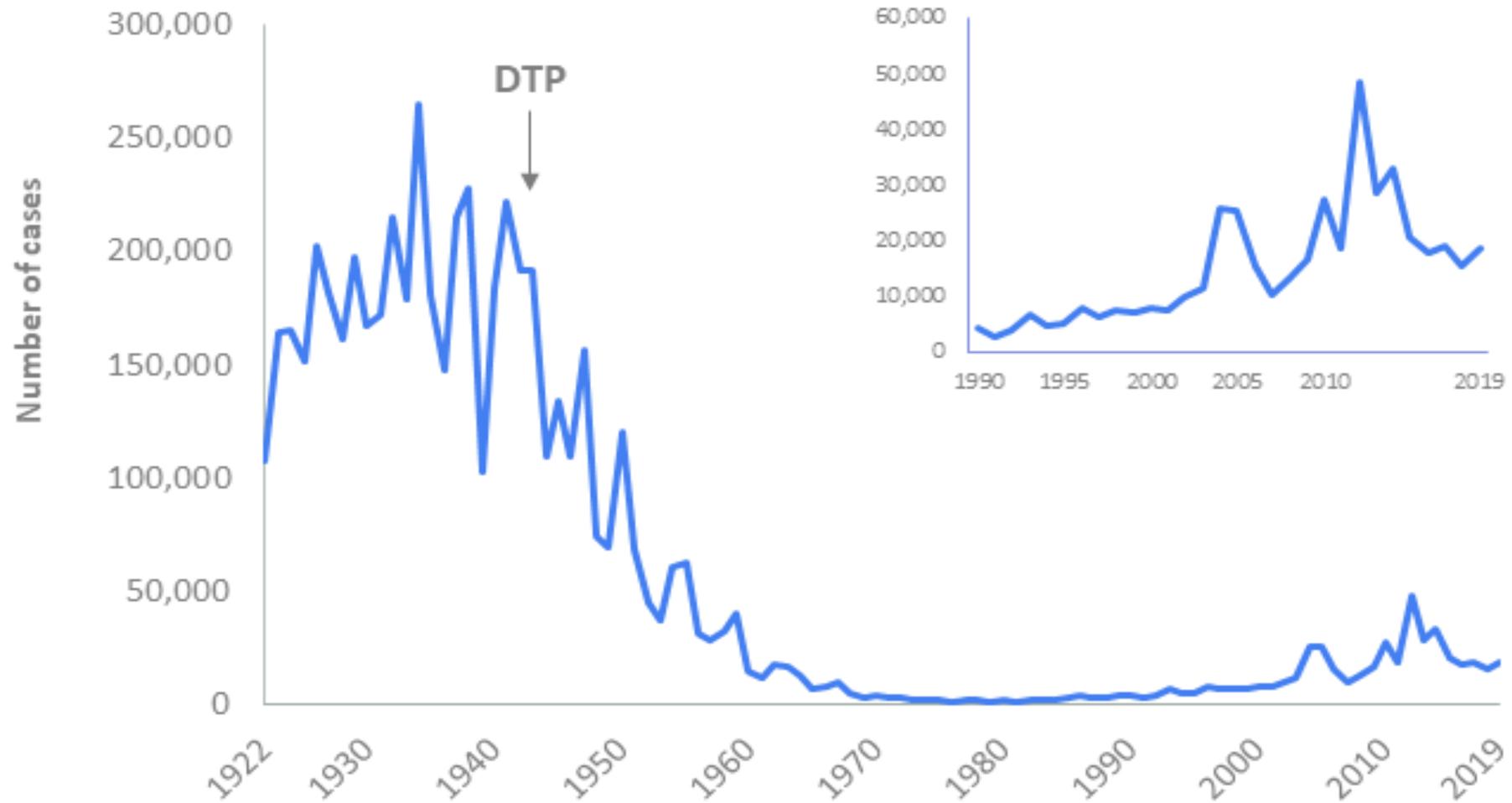
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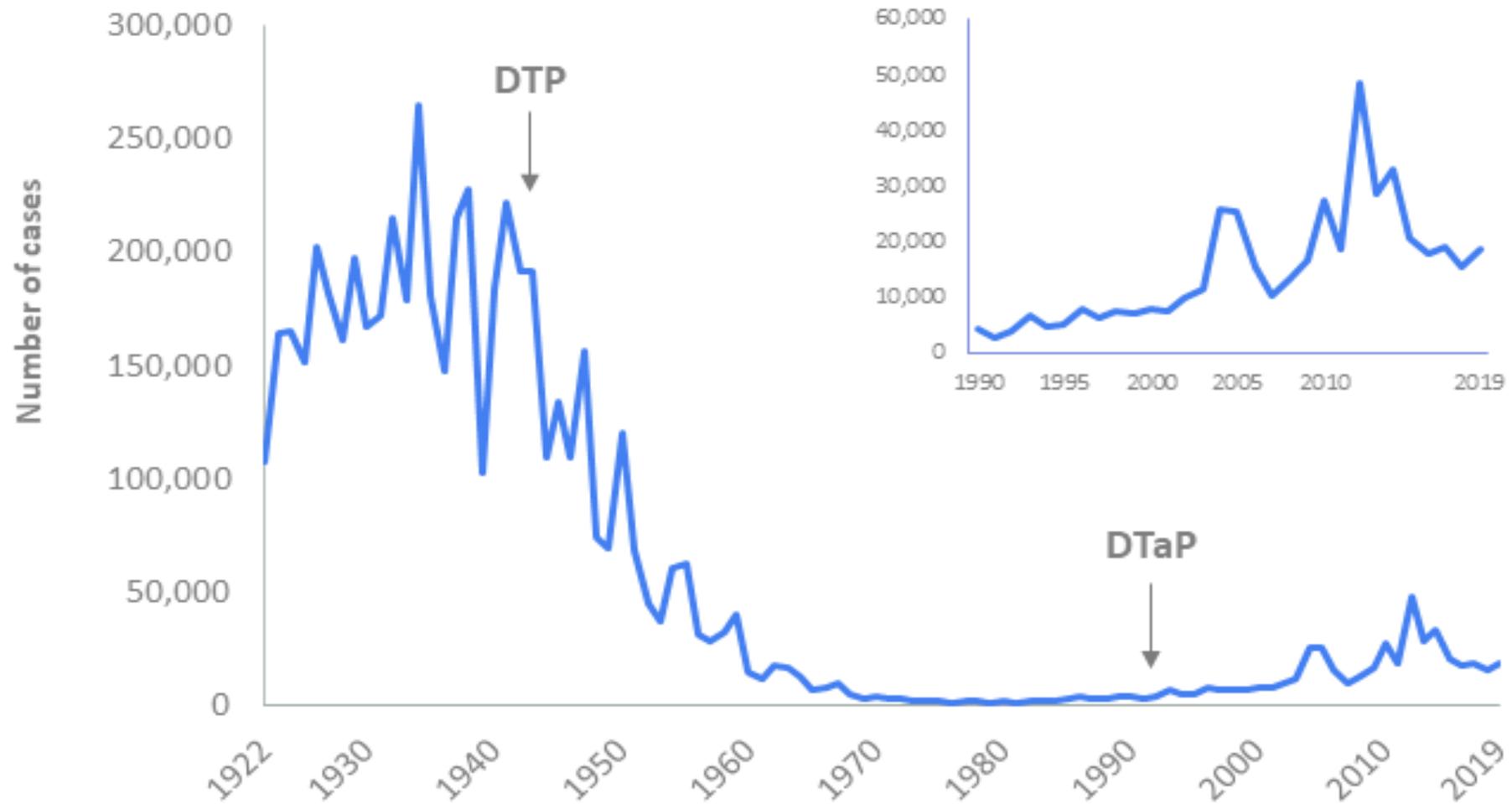
Reported Pertussis Cases — United States, 1922-2019



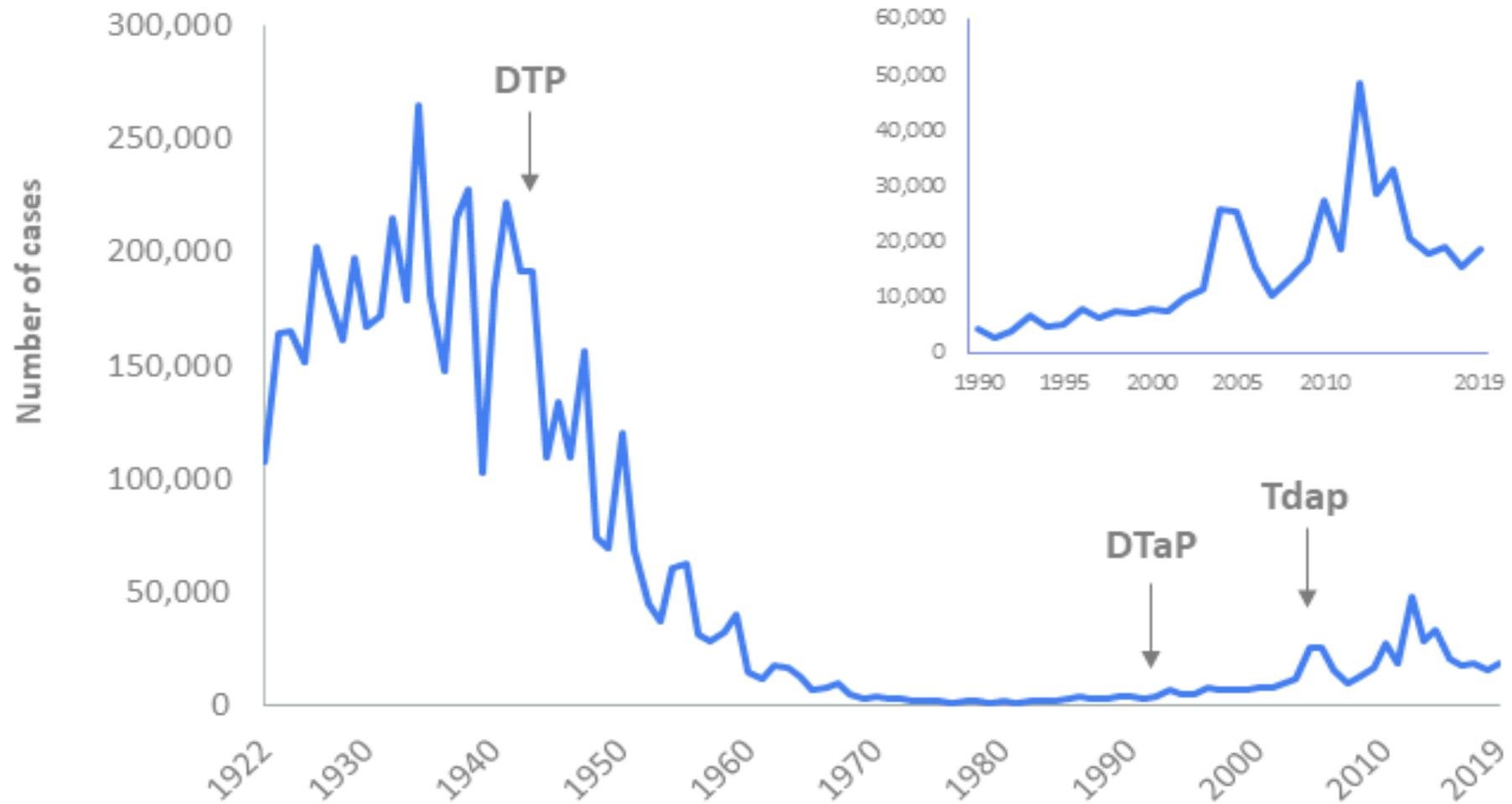
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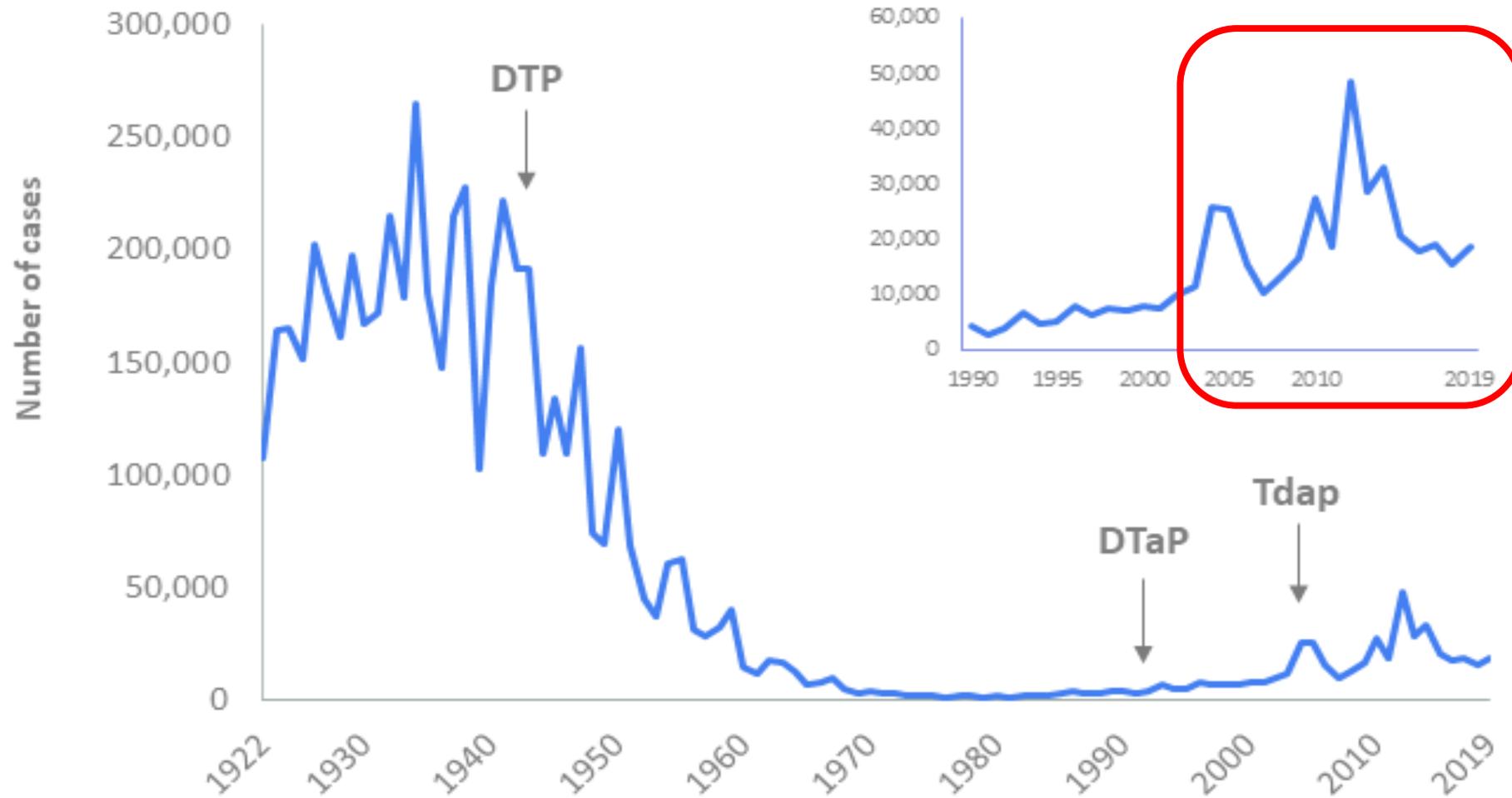
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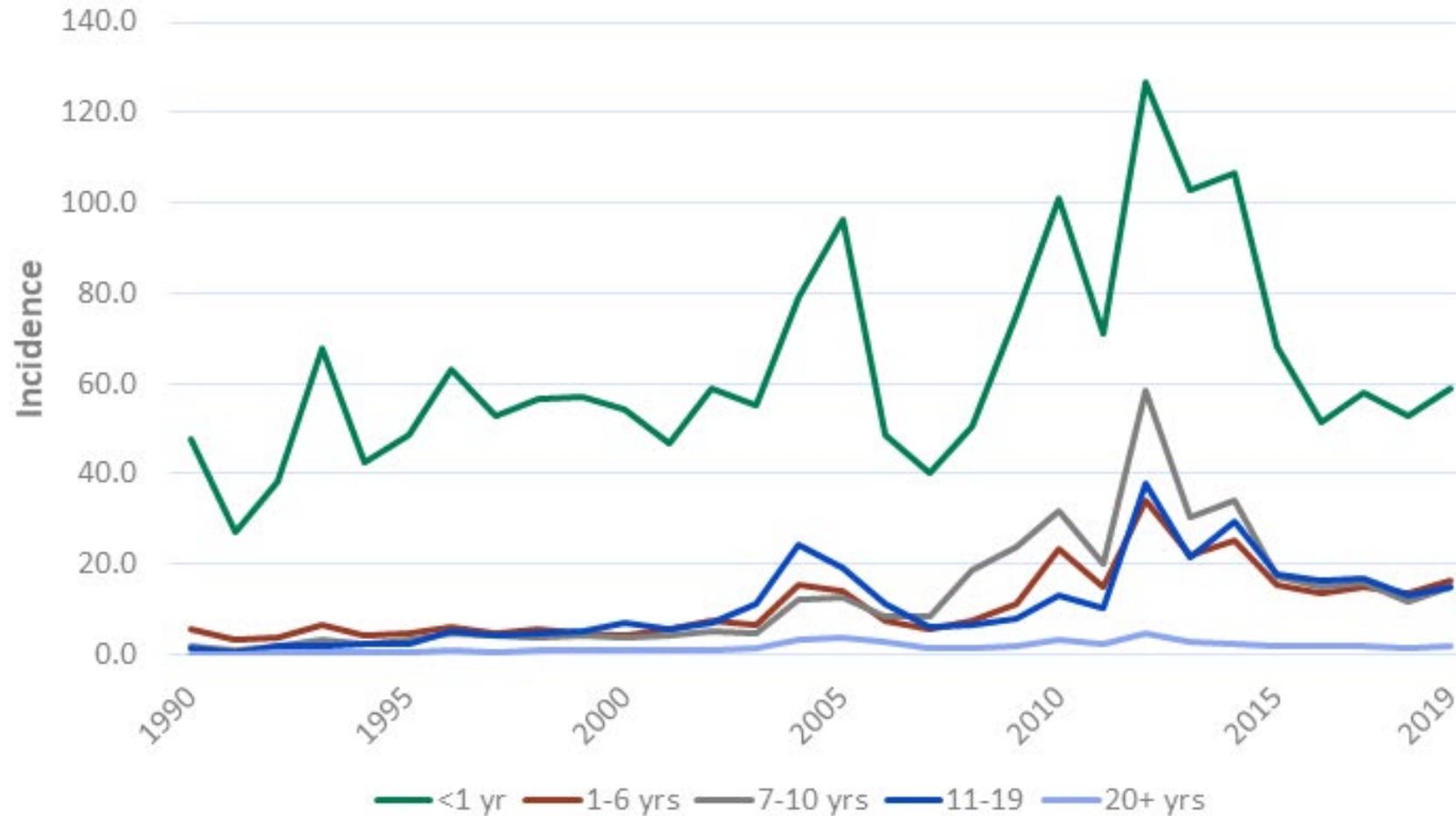
Reported Pertussis Cases — United States, 1922-2019



Reported Pertussis Cases — United States, 1922-2019



Reported Pertussis Incidence* by Age Group — United States, 1990-2019



*per 100,000 persons

National Notifiable Diseases Surveillance System

Pertussis Deaths in the United States, 2012–2021

| Age at onset | | |
|---------------------|---------------------|-------|
| Less than 12 months | 12 months and older | Total |
| 65 (68%) | 30 (32%) | 95 |

Pertussis Deaths in the United States, 2012–2021

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Pertussis in Infants



Why Adolescents and Adults Need Pertussis Vaccine



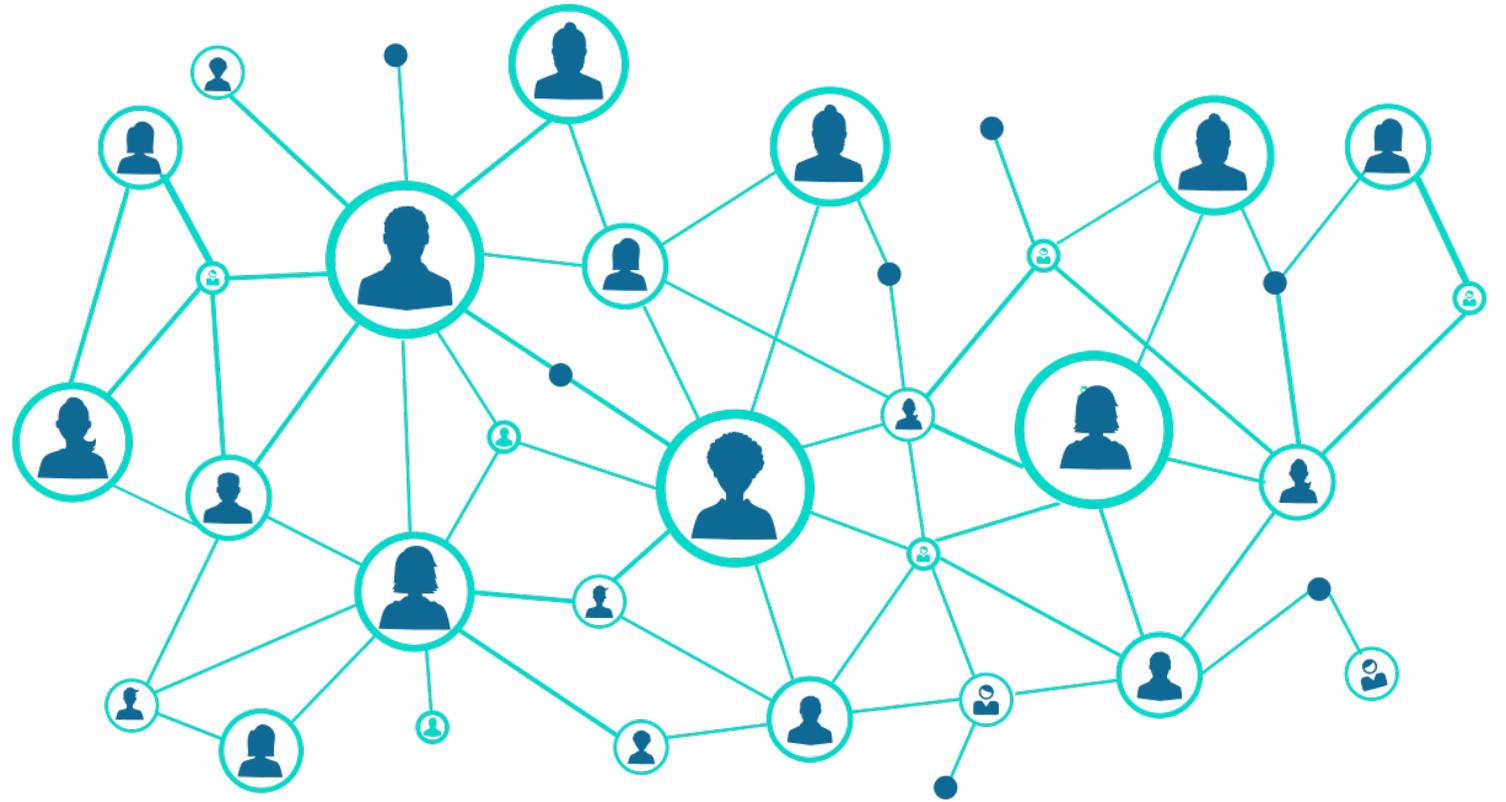
5,398 cases in 2020

>50% cases were in those
20 years of age and older

Why Adolescents and Adults Need Pertussis Vaccine



Why Adolescents and Adults Need Pertussis Vaccine



Why Adolescents and Adults Need Pertussis Vaccine



Older persons and **household contacts** often source of infection for infants and children

Pertussis Complications Among Adolescents and Adults



Prolonged cough



Post-tussive vomiting



Rib Fracture

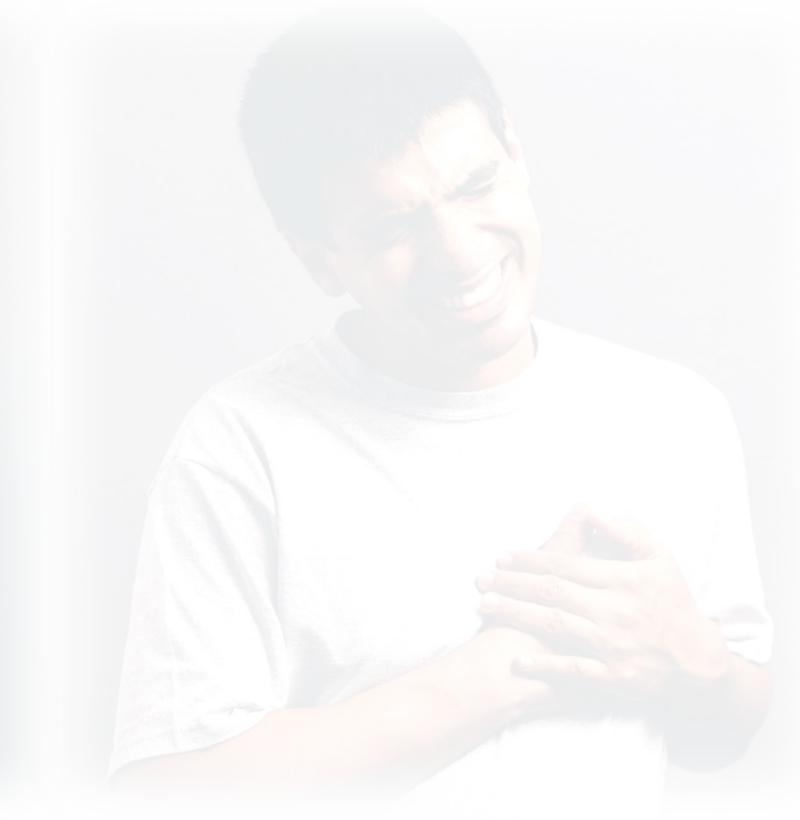
Pertussis Complications Among Adolescents and Adults



Prolonged cough

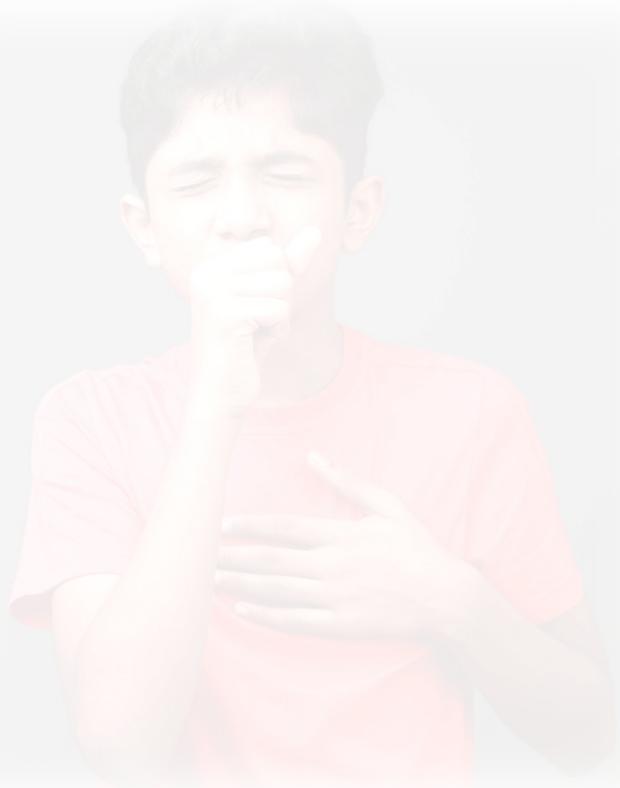


Post-tussive vomiting



Rib Fracture

Pertussis Complications Among Adolescents and Adults



Prolonged cough

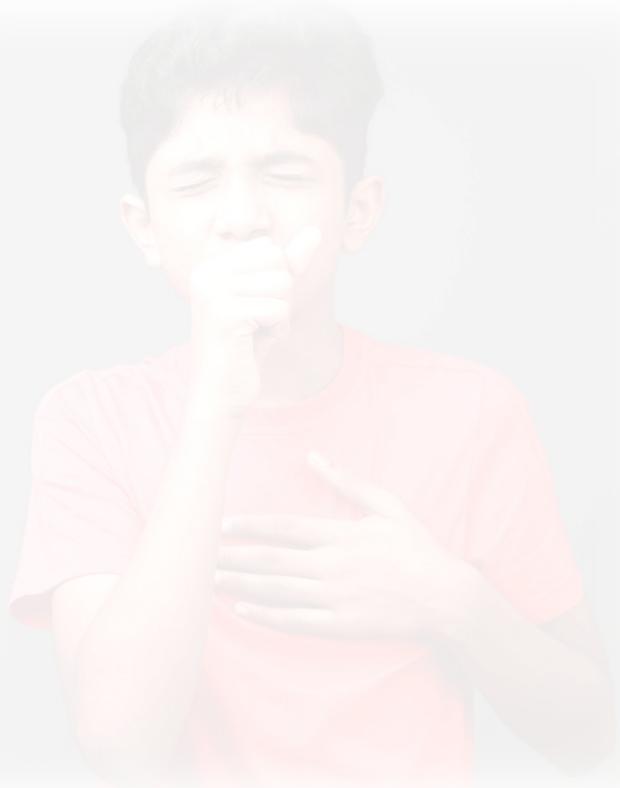


Post-tussive vomiting



Rib Fracture

Pertussis Complications Among Adolescents and Adults



Prolonged cough



Post-tussive vomiting



Rib Fracture

Pertussis Complications Among Adolescents and Adults



Vaccinate Throughout a Lifetime!



4

**DTaP/DT
and
Tdap/Td
Vaccines**

DTaP/DT and Tdap/Td Vaccines



- **Non-live vaccines**
- **Administered by IM (intramuscular) injection**
- **DTaP/DT contain more diphtheria component than Tdap/Td**
 - Hence, the capital “D”
 - Note that DT will be discontinued after 2022

DTaP/DT



6 Weeks



6 Years

DTaP/DT



6 Weeks



7 Years



6 Years

DTaP/DT

| Product (mfr) | Component(s) | Use for ages | Use for DTaP doses |
|------------------------|---------------------|---------------------|---------------------------|
| Daptacel (SP) | DTaP | 6 wks–6 yrs | 1–5 |
| Infanrix (GSK) | DTaP | 6 wks–6 yrs | 1–5 |
| DT (SP, no trade name) | DT | 6 wks–6 yrs | 1–5 |

DTaP/DT

| Product (mfr) | Component(s) | Use for ages | Use for DTaP doses |
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DTaP/DT

| Product (mfr) | Component(s) | Use for ages | Use for DTaP doses |
|---|---------------------|---------------------|---------------------------|
| Pediarix (GSK) | DTaP-HepB-IPV | 6 wks–6 yrs | 1–3 |
| Pentacel (SP) | DTaP-IPV/Hib | 6 wks–4 yrs | 1–4 |
| Vaxelis (Merck) | DTaP-IPV-Hib-HepB | 6 wks–4 yrs | 1–3 |
| Kinrix (GSK), Quadracel (SP) | DTaP-IPV | 4 yrs–6 yrs | 5 |

DTaP/DT

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DTaP/DT Vaccine Recommendations

Immunization Schedules



For Healthcare Providers

Child and Adolescent Schedule

Recommended vaccination schedule for ages 18 years or younger

[Birth to 18 Years](#)

Adult Schedule

Recommended vaccination schedule for ages 19 years or older

[19 Years or Older](#)

Clinical Vaccination Resources

[Download Schedule App for Healthcare Providers](#)

[Order Hard Copies of the Schedules](#)

[Vaccination Resources for Healthcare Providers](#)

Interim COVID-19 Immunization Schedule for Ages 5+

Guidance for COVID-19 vaccination schedules based on age and medical condition

[COVID-19 Vaccination Schedule](#)

<https://www.cdc.gov/vaccines/schedules/index.html>

DTaP/DT Vaccine Recommendations

| 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 |
|--|-------|------|----------------------|----------------------|----------------------|-------|--------|------------------------------|--------|-----------|---------|----------------------|
| Diphtheria, tetanus, acellular pertussis (DTaP <7 yrs) | | | 1 st dose | 2 nd dose | 3 rd dose | | | ←-- 4 th dose --→ | | | | 5 th dose |

 Range of recommended ages for all children

 Range of recommended ages for catch-up vaccination

DTaP/DT Vaccine Recommendations

| 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 |
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|--|-------|------|----------------------|----------------------|----------------------|-------|--------|--------------------------|--------|-----------|---------|----------------------|
| Diphtheria, tetanus, acellular pertussis (DTaP <7 yrs) | | | 1 st dose | 2 nd dose | 3 rd dose | | | ← 4 th dose → | | | | 5 th dose |

4th dose may be given earlier if:

- Child is at least 12 months of age, and
- At least 6 months since DTaP dose 3, and
- The child is unlikely to return at 15–18 months of age

DTaP/DT Vaccine Recommendations

| 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 |
|--|-------|------|----------------------|----------------------|----------------------|-------|--------|--------------------------|--------|-----------|---------|----------------------|
| Diphtheria, tetanus, acellular pertussis (DTaP <7 yrs) | | | 1 st dose | 2 nd dose | 3 rd dose | | | ← 4 th dose → | | | | 5 th dose |

 Range of recommended ages for all children

 Range of recommended ages for catch-up vaccination

DTaP/DT Vaccine Recommendations

| 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 |
|--|-------|------|----------------------|----------------------|----------------------|-------|--------|--------------------------|--------|-----------|---------|----------------------|
| Diphtheria, tetanus, acellular pertussis (DTaP <7 yrs) | | | 1 st dose | 2 nd dose | 3 rd dose | | | ← 4 th dose → | | | | 5 th dose |

5th dose not necessary if:

- 4th dose was administered anytime at 4 years of age or older, and
- 4th dose is at least 6 months after the 3rd dose

DTaP/DT Vaccine Recommendations

| 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 |
|--|-------|------|----------------------|----------------------|----------------------|-------|--------|--------------------------|--------|-----------|---------|----------------------|
| Diphtheria, tetanus, acellular pertussis (DTaP <7 yrs) | | | 1 st dose | 2 nd dose | 3 rd dose | | | ← 4 th dose → | | | | 5 th dose |

DTaP products NOT approved for 5th dose:



DTaP/DT Vaccine Recommendations



Children who received 5 doses *before* age 4, should receive an **additional dose** of DTaP *after* age 4 and at least 6 months after their previous dose

DTaP/DT Vaccine Recommendations

| 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 |
|--|-------|------|----------------------|----------------------|----------------------|--|--------|--------------------------|--------|--|---------|----------------------|
| Diphtheria, tetanus, acellular pertussis (DTaP <7 yrs) | | | 1 st dose | 2 nd dose | 3 rd dose | Range of recommended ages for catch-up vaccination | | ← 4 th dose → | | Range of recommended ages for catch-up vaccination | | 5 th dose |

 Range of recommended ages for all children

 Range of recommended ages for catch-up vaccination

DTaP/DT Accelerated Schedule

| Dose | Routine Age | Minimum Interval to Next Dose |
|------------------|--------------------|--------------------------------------|
| Primary 1 | 2 months | 4 weeks |
| Primary 2 | 4 months | 4 weeks |
| Primary 3 | 6 months | 6 months |

Diphtheria and Tetanus Toxoid DT Vaccine

- DT should only be used for children with a true contraindication to pertussis vaccine
- Administered as a 3- or 4-dose series
 - First dose of DT at younger than 1 year of age: Total of 4 doses
 - First dose of DT at 1 year of age or older: Total of 3 doses
- 4th or 5th dose at school entry not needed if pertussis vaccine is not being administered
- DT vaccine will be **discontinued** after 2022

Combination Vaccines

| Product (mfr) | Component(s) | Use for ages | Use for DTaP doses |
|---|---------------------|---------------------|---------------------------|
| Pediarix (GSK) | DTaP-HepB-IPV | 6 wks–6 yrs | 1–3 |
| Pentacel (SP) | DTaP-IPV/Hib | 6 wks–4 yrs | 1–4 |
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| Product (mfr) | Component(s) | Use for ages | Use for DTaP doses |
|---------------------------------|-------------------|--------------|--------------------|
| Pediarix (GSK) | DTaP-HepB-IPV | 6 wks–6 yrs | 1–3 |
| Pentacel (SP) | DTaP-IPV/Hib | 6 wks–4 yrs | 1–4 |
| Vaxelis (Merck) | DTaP-IPV-Hib-HepB | 6 wks–4 yrs | 1–3 |
| Kinrix (GSK), Quadracel (SP) | DTaP-IPV | 4 yrs–6 yrs | 5 |

Pediarix

- **Components: DTaP, HepB, and IPV**
- **Licensed for:**
 - Children 6 weeks through 6 years of age
 - Doses 1–3
- **Do NOT use for dose 4 or 5**
- **Minimum age is 6 weeks. Cannot be used for the birth dose of HepB**
- **Can be given to infants who received a birth dose of hepatitis B vaccine**
 - Total of 4 doses of HepB vaccine

Combination Vaccines

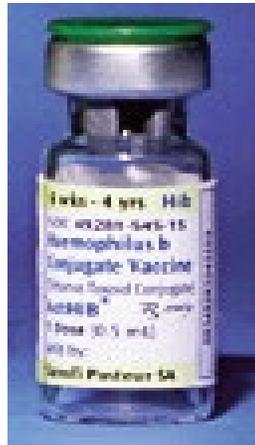
| Product (mfr) | Component(s) | Use for ages | Use for DTaP doses |
|---------------------------------|-------------------|--------------|--------------------|
| Pediarix (GSK) | DTaP-HepB-IPV | 6 wks–6 yrs | 1–3 |
| Pentacel (SP) | DTaP-IPV/Hib | 6 wks–4 yrs | 1–4 |
| Vaxelis (Merck) | DTaP-IPV-Hib-HepB | 6 wks–4 yrs | 1–3 |
| Kinrix (GSK), Quadracel (SP) | DTaP-IPV | 4 yrs–6 yrs | 5 |

Pentacel

- **Components: DTaP, IPV, and Hib**
- **Licensed for:**
 - Children 6 weeks through 4 years of age
 - Doses 1–4
- **Do NOT use for dose 5**

DTaP-IPV/Hib (Pentacel)

- Must be reconstituted (mixed) prior to administration
- Use **ONLY** the manufacturer-supplied vaccine diluent (DTaP-IPV)



Hib vaccine

+



DTaP-IPV diluent

=



Pentacel vaccine

Combination Vaccines

| Product (mfr) | Component(s) | Use for ages | Use for DTaP doses |
|---------------------------------|-------------------|--------------|--------------------|
| Pediarix (GSK) | DTaP-HepB-IPV | 6 wks–6 yrs | 1–3 |
| Pentacel (SP) | DTaP-IPV/Hib | 6 wks–4 yrs | 1–4 |
| Vaxelis (Merck) | DTaP-IPV-Hib-HepB | 6 wks–4 yrs | 1–3 |
| Kinrix (GSK), Quadracel (SP) | DTaP-IPV | 4 yrs–6 yrs | 5 |

Vaxelis

- **Components: DTaP, IPV, Hib, HepB**
- **Licensed for:**
 - Children 6 weeks through 4 years
 - Doses 1–3
- **Do NOT use for dose 4 or 5**
- **Minimum age is 6 weeks. Cannot be used for the birth dose of HepB**
- **Can be given to infants who received a birth dose of hepatitis B vaccine**
 - Total of 4 doses of HepB vaccine

Combination Vaccines

| Product (mfr) | Component(s) | Use for ages | Use for DTaP doses |
|---|---------------------|---------------------|---------------------------|
| Pediarix (GSK) | DTaP-HepB-IPV | 6 wks–6 yrs | 1–3 |
| Pentacel (SP) | DTaP-IPV/Hib | 6 wks–4 yrs | 1–4 |
| Vaxelis (Merck) | DTaP-IPV-Hib-HepB | 6 wks–4 yrs | 1–3 |
| Kinrix (GSK), Quadracel (SP) | DTaP-IPV | 4 yrs–6 yrs | 5 |

DTaP-IPV (Kinrix and Quadracel)

- **Components: DTaP and IPV**
- **Licensed for:**
 - Children 4 through 6 years of age
 - Dose 5 only
- **Do NOT use for dose 1, 2, 3, or 4**

Interchangeability of Different Brands of DTaP Vaccine

- **Whenever feasible, the same DTaP vaccine should be used for all doses of the series.**
- **Limited data suggest that “mix and match” DTaP schedules do not adversely affect safety and immunogenicity.**
- **If the vaccine used for earlier doses is not known or not available, any brand may be used to complete the series.**

Q&A

- **A 4-month-old infant presents for a routine well child visit and inadvertently receives Tdap instead of DTaP. Does this dose need to be repeated?**
 - A. Yes
 - B. No



Q&A

- A 4-month-old infant presents for a routine well child visit and inadvertently receives Tdap instead of DTaP. Does this dose need to be repeated?
 - A. YES



Q&A

X
Tdap

| 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 |
|--|-------|------|----------------------|----------------------|----------------------|-------|--------|--------------------------|--------|-----------|---------|----------------------|
| Diphtheria, tetanus, acellular pertussis (DTaP <7 yrs) | | | 1 st dose | 2 nd dose | 3 rd dose | | | ← 4 th dose → | | | | 5 th dose |

 Range of recommended ages for all children

 Range of recommended ages for catch-up vaccination

Q&A

✓
Tdap

✓
Tdap

| 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 |
|--|-------|------|----------------------|----------------------|----------------------|-------|--------|------------------------------|--------|-----------|---------|----------------------|
| Diphtheria, tetanus, acellular pertussis (DTaP <7 yrs) | | | 1 st dose | 2 nd dose | 3 rd dose | | | ←-- 4 th dose --→ | | | | 5 th dose |

 Range of recommended ages for all children

 Range of recommended ages for catch-up vaccination

Q&A


Tdap


DTaP

| 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 |
|--|-------|------|----------------------|----------------------|----------------------|-------|--------|------------------------------|--------|-----------|---------|----------------------|
| Diphtheria, tetanus, acellular pertussis (DTaP <7 yrs) | | | 1 st dose | 2 nd dose | 3 rd dose | | | ←-- 4 th dose --→ | | | | 5 th dose |

 Range of recommended ages for all children

 Range of recommended ages for catch-up vaccination

Q&A

VAERS

Vaccine Adverse Event Reporting System
www.vaers.hhs.gov

Tdap/Td Vaccines

| Product (mfr) | Component(s) | Use for ages |
|---------------|--------------|---------------------|
| Boostrix | Tdap | 10 years and older |
| Adacel | Tdap | 10 through 64 years |
| TDVAX | Td | 7 years and older |
| TENIVAC | Td | 7 years and older |

Tdap/Td Vaccines

| Product (mfr) | Component(s) | Use for ages |
|---------------|--------------|---------------------|
| Boostrix | Tdap | 10 years and older |
| Adacel | Tdap | 10 through 64 years |
| TDVAX | Td | 7 years and older |
| TENIVAC | Td | 7 years and older |

Tdap/Td Vaccines

| Product (mfr) | Component(s) | Use for ages |
|---------------|--------------|---------------------|
| Boostrix | Tdap | 10 years and older |
| Adacel | Tdap | 10 through 64 years |
| TDVAX | Td | 7 years and older |
| TENIVAC | Td | 7 years and older |

Tdap/Td Vaccine Recommendations

| Vaccine | 7–10 yrs | 11–12 yrs | 13–15 yrs | 16 yrs | 17–18 yrs |
|--|----------|-----------|-----------|--------|-----------|
| Tetanus, diphtheria, acellular pertussis (Tdap ≥7 yrs) | | 1 dose | | | |

| Vaccine | 19–26 years | 27–49 years | 50–64 years | ≥65 years |
|---|---|-------------|-------------|-----------|
| Tetanus, diphtheria, pertussis (Tdap or Td) | 1 dose Tdap each pregnancy; 1 dose Td/Tdap for wound management (see notes) | | | |
| | 1 dose Tdap, then Td or Tdap booster every 10 years | | | |

Tdap/Td Vaccine Recommendations

| Vaccine | 7–10 yrs | 11–12 yrs | 13–15 yrs | 16 yrs | 17–18 yrs |
|--|----------|-----------|-----------|--------|-----------|
| Tetanus, diphtheria, acellular pertussis (Tdap ≥7 yrs) | | 1 dose | | | |

| Vaccine | 19–26 years | 27–49 years | 50–64 years | ≥65 years |
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| Tetanus, diphtheria, pertussis (Tdap or Td) | 1 dose Tdap each pregnancy; 1 dose Td/Tdap for wound management (see notes) | | | |
| | 1 dose Tdap, then Td or Tdap booster every 10 years | | | |

 Range of recommended ages for all children

 Range of recommended ages for catch-up vaccination

 Range of recommended ages for certain high-risk groups

Tdap/Td Vaccine Recommendations

| Vaccine | 7-10 yrs | 11-12 yrs | 13-15 yrs | 16 yrs | 17-18 yrs |
|--|----------|-----------|-----------|--------|-----------|
| Tetanus, diphtheria, acellular pertussis (Tdap ≥7 yrs) | | 1 dose | | | |

| Vaccine | 19-26 years | 27-49 years | 50-64 years | ≥65 years |
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| Tetanus, diphtheria, pertussis (Tdap or Td) | 1 dose Tdap each pregnancy; 1 dose Td/Tdap for wound management (see notes) | | | |
| | 1 dose Tdap, then Td or Tdap booster every 10 years | | | |

Range of recommended ages for all children

Range of recommended ages for catch-up vaccination

Range of recommended ages for certain high-risk groups

Tdap/Td Vaccine Recommendations

| Vaccine | 7-10 yrs | 11-12 yrs | 13-15 yrs | 16 yrs | 17-18 yrs |
|--|----------|-----------|-----------|--------|-----------|
| Tetanus, diphtheria, acellular pertussis (Tdap ≥7 yrs) | | 1 dose | | | |

| Vaccine | 19-26 years | 27-49 years | 50-64 years | ≥65 years |
|---|---|-------------|-------------|-----------|
| Tetanus, diphtheria, pertussis (Tdap or Td) | 1 dose Tdap each pregnancy; 1 dose Td/Tdap for wound management (see notes) | | | |
| | 1 dose Tdap, then Td or Tdap booster every 10 years | | | |

 Range of recommended ages for all children

 Range of recommended ages for catch-up vaccination

 Range of recommended ages for certain high-risk groups

*Tdap considered off-label for children age 7-9 years but is still recommended by ACIP

Tdap/Td Vaccine Recommendations

| Vaccine | 7–10 yrs | 11–12 yrs | 13–15 yrs | 16 yrs | 17–18 yrs |
|--|----------|-----------|-----------|--------|-----------|
| Tetanus, diphtheria, acellular pertussis (Tdap ≥7 yrs) | | 1 dose | | | |

| Vaccine | 19–26 years | 27–49 years | 50–64 years | ≥65 years |
|---|---|-------------|-------------|-----------|
| Tetanus, diphtheria, pertussis (Tdap or Td) | 1 dose Tdap each pregnancy; 1 dose Td/Tdap for wound management (see notes) | | | |
| | 1 dose Tdap, then Td or Tdap booster every 10 years | | | |

 Range of recommended ages for all children

 Range of recommended ages for catch-up vaccination

 Range of recommended ages for certain high-risk groups

Tdap/Td Vaccine Recommendations

| Vaccine | 7–10 yrs | 11–12 yrs | 13–15 yrs | 16 yrs | 17–18 yrs |
|--|----------|-----------|-----------|--------|-----------|
| Tetanus, diphtheria, acellular pertussis (Tdap ≥7 yrs) | | 1 dose | | | |

| Vaccine | 19–26 years | 27–49 years | 50–64 years | ≥65 years |
|---|---|-------------|-------------|-----------|
| Tetanus, diphtheria, pertussis (Tdap or Td) | 1 dose Tdap each pregnancy; 1 dose Td/Tdap for wound management (see notes) | | | |
| | 1 dose Tdap, then Td or Tdap booster every 10 years | | | |

 Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection

 Recommended vaccination for adults with an additional risk factor or another indication

Tdap/Td Vaccine Recommendations

| Vaccine | 7–10 yrs | 11–12 yrs | 13–15 yrs | 16 yrs | 17–18 yrs |
|--|----------|-----------|-----------|--------|-----------|
| Tetanus, diphtheria, acellular pertussis (Tdap ≥7 yrs) | | 1 dose | | | |

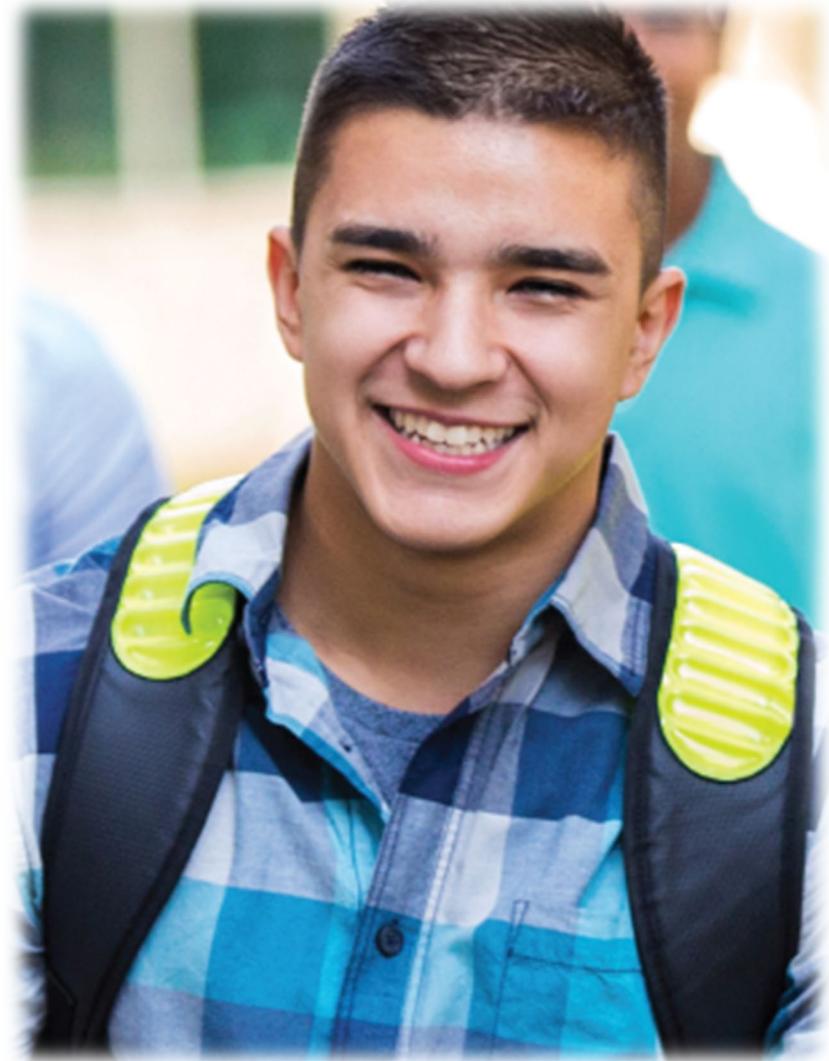
| Vaccine | 19–26 years | 27–49 years | 50–64 years | ≥65 years |
|---|---|-------------|-------------|-----------|
| Tetanus, diphtheria, pertussis (Tdap or Td) | 1 dose Tdap each pregnancy; 1 dose Td/Tdap for wound management (see notes) | | | |
| | 1 dose Tdap, then Td or Tdap booster every 10 years | | | |

 Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection

 Recommended vaccination for adults with an additional risk factor or another indication

Tdap Recommendations: Adolescents

- Routinely recommended at age 11 or 12 years
- Catch up adolescents age 13 years and older who were not vaccinated



Tdap Recommendations: Adults

- **Administer Tdap vaccine to persons 19 years of age and older who were NOT *previously vaccinated* and to those with unknown vaccination status**
 - Then Td or Tdap every 10 years
- **Administer 1 dose Tdap during each pregnancy**
 - Preferably in early part of gestational weeks 27–36 weeks



Q&A

- **A 21-year-old woman has a history of a complete series of DTaP vaccine and a dose of Tdap at 11 years of age. She is not pregnant. May she receive a dose of Tdap at her next well visit?**
- A. Yes
- B. No



Q&A

- **A 21-year-old woman has a history of a complete series of DTaP vaccine and a dose of Tdap at 11 years of age. She is not pregnant. May she receive a dose of Tdap at her next well visit?**
- **A. YES.** Subsequent doses of tetanus-toxoid-containing vaccine may be either Td or Tdap



5

**Clinical
Considerations**

Tdap Recommendations: Children 7 through 10 Years of Age*

- Children 7–10 years of age who have not completed a primary series or are not fully immunized against pertussis need Tdap
- For those who received Tdap at 7–9 years of age, they need the routine adolescent Tdap dose at 11 or 12 years of age



*Off-label ACIP recommendation

Liang JL, Tiwari T, Moro P, et al. Prevention of Pertussis, Tetanus, and Diphtheria with Vaccines in the United States: Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Recomm Rep 2018;67(No. RR-2):1–44. DOI: [http://dx.doi.org/10.15585/mmwr.rr6702a1external icon](http://dx.doi.org/10.15585/mmwr.rr6702a1external_icon).

Tdap Recommendations: Pregnant Women

- **Previous recommendation was “cocooning”**
 - Health care personnel
 - New fathers and mothers
 - Other family members
 - Day care workers or babysitters
- **Cocooning data were inconclusive**
- **No additional doses are recommended, but close contacts are still encouraged to get vaccinated**

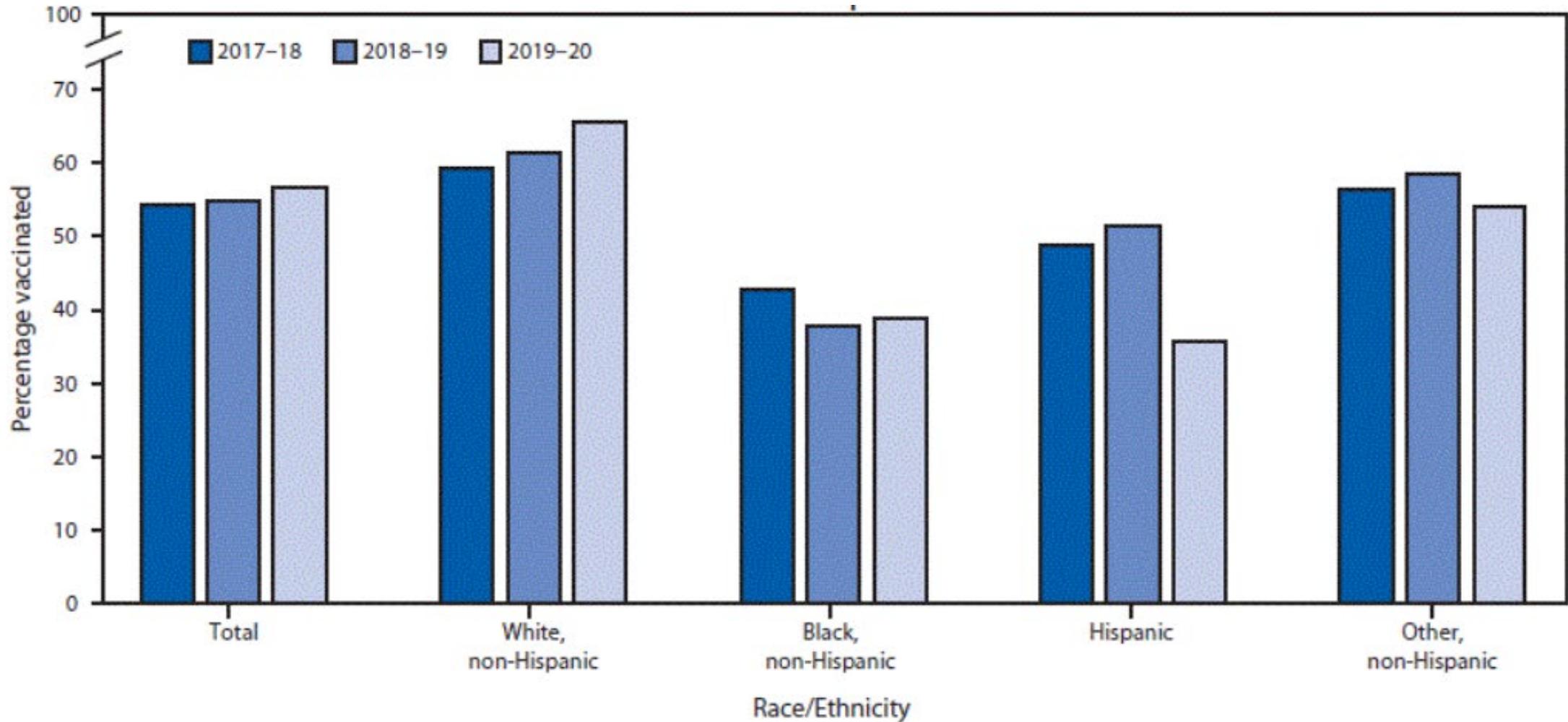


Tdap Recommendations: Pregnant Women

- **Administer 1 dose Tdap during each pregnancy regardless of the patient's prior history of receiving the vaccine**
 - Preferably in early part of gestational weeks 27–36 weeks
- **Tdap vaccination during pregnancy, in combination with cocooning and the infant getting all recommended doses on time provides the best protection**
- **Maternal vaccination during pregnancy is 69%-93% effective at preventing disease**
- **During 2019–20, only 56.6% received Tdap during pregnancy**



Tdap vaccination coverage among pregnant women varies by race



Safety of Tdap for Every Pregnancy

- Data reassuring on 2 doses of Tdap
- Data and experience with tetanus toxoid vaccine suggest no excess risk of adverse events
 - ~5% of women would receive 4 or more doses
- CDC provides ongoing monitoring to address concerns about the safety of Tdap given during subsequent pregnancies



Postpartum Women and Close Contacts of Infants

- **Previously unvaccinated EVER or vaccination status unknown—administer Tdap**
- **Previously vaccinated persons—Tdap is *not* indicated**
 - Including mothers, fathers, siblings, and grandparents
 - Any previous, documented dose counts.



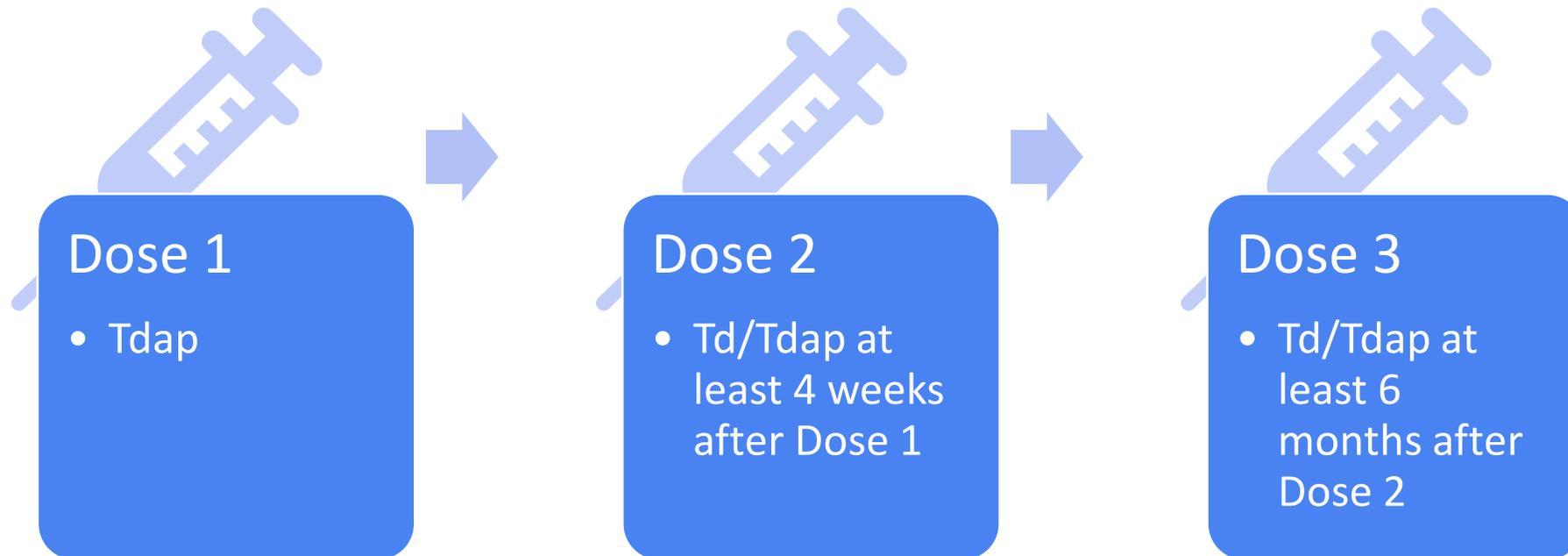
Tdap for Persons Without History of DTP or DTaP

- All adolescents and adults should have documentation of a primary series of DTaP, DTP, DT, Tdap, or Td
- Persons without documentation who have never been vaccinated or have unknown status should receive a 3-dose primary series
- One dose should be Tdap, preferably the first



Tdap for Persons Without History of DTP or DTaP

- Preferred schedule:

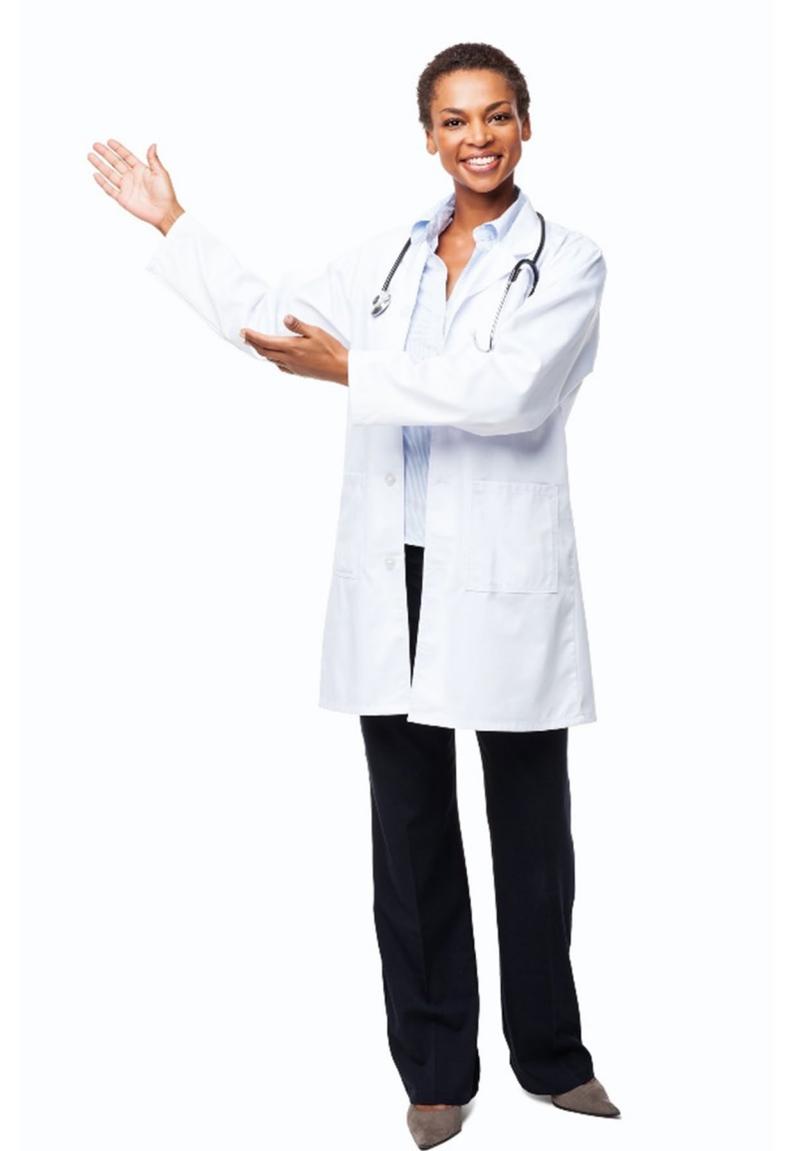


Booster Td/Tdap every 10 years

Tdap and Health Care Personnel (HCP)

- HCPs follow the general recommendations as previously described
- Priority should be given to vaccination of healthcare personnel who have direct contact with infants 12 months of age and younger
- Additional doses of Tdap are not recommended for previously vaccinated HCP*

*Except pregnant women



Tetanus Prophylaxis in Routine Wound Management



Tetanus Prophylaxis in Routine Wound Management



Major Wounds:
contaminated, soil, saliva
wounds

Tetanus Prophylaxis in Routine Wound Management



- Td/Tdap recommended if more than 5 years since last dose or fewer than 3 lifetime doses
- If fewer than 3 lifetime doses, then administer tetanus immune globulin (TIG) in addition to Td/Tdap

Tetanus Prophylaxis in Routine Wound Management



- **If wound is a clean wound**
 - Administer Td/Tdap if less than 3 lifetime doses
 - TIG is not necessary

Tetanus Prophylaxis in Routine Wound Management

| No. doses of adsorbed tetanus toxoid-containing vaccines | Clean and minor wound | | All other wounds* | |
|--|--------------------------------|-----|--------------------------------|------------------|
| | DTaP, Tdap, or Td [†] | TIG | DTaP, Tdap, or Td [†] | TIG [‡] |
| Unknown or <3 | Yes | No | Yes | Yes |
| ≥3 | No [§] | No | No ^{**} | No |

Abbreviations: DTaP = diphtheria and tetanus toxoids and acellular pertussis vaccine; Tdap = tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis; Td = tetanus and diphtheria toxoids; TIG = tetanus immune globulin.

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

[†] DTaP is recommended for children aged <7 years. Tdap is preferred to Td for persons aged ≥11 years who have not previously received Tdap. Persons aged ≥7 years who are not fully immunized against pertussis, tetanus or diphtheria should receive one dose of Tdap for wound management and as part of the catch-up series.

[‡] Persons with HIV infection or severe immunodeficiency who have contaminated wounds should also receive TIG, regardless of their history of tetanus immunization.

[§] Yes, if >10 years since the last tetanus toxoid-containing vaccine dose.

^{**} Yes, if ≥5 years since the last tetanus toxoid-containing vaccine dose.

Q&A

- **A 45-year-old woman with Crohn's Disease currently on Infliximab now presents for a Tdap/Td booster. May she receive a dose of Tdap/Td at this visit?**
 - A. Yes
 - B. No



Q&A

- **A 45-year-old woman with Crohn's Disease currently on Infliximab now presents for a Tdap/Td booster. May she receive a dose of Tdap/Td at this visit?**
 - **A. YES.** Tdap/Td are non-live vaccines and may be administered either simultaneously with or at any interval before or after receipt of an antibody-containing product



6

Safety

Contraindications

DTaP

Severe allergic reaction to vaccine component or following a prior dose

Encephalopathy not due to another identifiable cause occurring within 7 days after vaccination

Tdap

Severe allergic reaction to vaccine component or following a prior dose

Encephalopathy not due to another identifiable cause occurring within 7 days after vaccination

Precautions

| DTaP | Tdap |
|---|---|
| Moderate or severe acute illness | Moderate or severe acute illness |
| Guillain-Barré syndrome within 6 weeks after previous dose | Guillain-Barré syndrome within 6 weeks after previous dose |
| Arthus-type hypersensitivity reaction after a previous dose | Arthus-type hypersensitivity reaction after a previous dose |
| Progressive or unstable neurologic disorder, including infantile spasms, uncontrolled seizures, or progressive encephalopathy until a treatment regimen has been established and the condition has stabilized | Progressive or unstable neurologic disorder, including infantile spasms, uncontrolled seizures, or progressive encephalopathy until a treatment regimen has been established and the condition has stabilized |

Adverse Reactions



Local reactions (pain, redness, swelling)

- DTaP: Up to 40%
- Tdap*: 21– 66%



Fever

- DTaP: Up to 27%
- Tdap: 1.4% (Tdap), 1.1% (Td)

*Adverse reactions occur at approximately the same rate as Td alone (without acellular pertussis component).

Adverse Reactions

Headache

Fatigue

Gastrointestinal
symptoms

Brachial
Neuritis

Adverse Reactions

Headache

Fatigue

Gastrointestinal symptoms

Brachial Neuritis

0.00075%

Adverse Reactions Following DTaP Dose 4 or 5

- **Local adverse reactions and fever increased**
- **Reports of swelling of entire limb**
 - Self-limited and resolves without sequelae
- **Limb swelling after dose 4 NOT a contraindication to dose 5**



7

**Storage and
Handling**

Diphtheria, Tetanus, and Pertussis Storage and Handling

- Store diphtheria, tetanus, and pertussis vaccines refrigerated between 2°C and 8°C (36°F and 46°F)
- Do not freeze vaccine or expose to freezing temperatures
- For vaccine that require reconstitution, Pentacel[®], the manufacturer packages the diluent and vaccine should be stored together in the refrigerator
- Store in the original packaging

DTaP (Daptacel)
Ages: 6 weeks through 6 years
Use for: Any dose in the series
Route: Intramuscular (IM) injection

DTaP-IPV (Kinrix)
Ages: 4 years through 6 years
Use for: DTaP dose #5
IPV dose #4
Do NOT use for DTaP doses 1 through 4 OR IPV doses 1 through 3
Route: Intramuscular (IM) injection

DTaP (Infanrix)
Ages: 6 weeks through 6 years
Use for: Any dose in the series
Route: Intramuscular (IM) injection

DTaP-IPV-HepB (Pediatrix)
Ages: 6 weeks through 6 years
Use for: DTaP and IPV: Doses #1, #2, and/or #3
HepB: Any dose in the series
Do NOT use for HepB birth dose
Route: Intramuscular (IM) injection

DTaP-IPV-Hib (Pentacel)
Ages: 6 weeks through 4 years
Use for: DTaP and IPV: Doses #1, #2, #3, and/or #4
Hib: Any dose in the series
Route: Intramuscular (IM) injection
Reconstitute Hib powder ONLY with manufacturer-supplied DTaP-IPV liquid diluent
Use immediately after reconstitution
Do NOT administer DTaP-IPV w/o Hib

DTaP-IPV-HepB-Hib (Vaxelis)
Ages: 6 weeks through 4 years
Use for: DTaP and IPV: Doses #1, #2, and/or #3
Hep B: Any dose in the series
(Do NOT use for HepB birth dose)
Hib: Any dose in the series
Route: Intramuscular (IM) injection

DTaP-IPV (Quadracel)
Ages: 4 years through 6 years
Use for: DTaP dose #5
IPV dose #4 or #5
Do NOT use for DTaP doses 1 through 4 OR IPV doses 1 through 3
Route: Intramuscular (IM) injection

Diphtheria, Tetanus, and Pertussis Storage and Handling

- Store diphtheria, tetanus, and pertussis vaccines refrigerated between 2°C and 8°C (36°F and 46°F)
- Do not freeze vaccine or expose to freezing temperatures
- For vaccine that require reconstitution, Pentacel[®], the manufacturer packages the diluent and vaccine should be stored together in the refrigerator.
- Store in the original packaging

| | |
|--|---|
| DTaP (Daptacel) Ages: 6 weeks through 6 years Use for: Any dose in the series Route: Intramuscular (IM) injection | DTaP-IPV (Kinrix) Ages: 4 years through 6 years Use for: DTaP dose #5 IPV dose #4 Do NOT use for DTaP doses 1 through 4 OR IPV doses 1 through 3 Route: Intramuscular (IM) injection |
| DTaP (Infanrix) Ages: 6 weeks through 6 years Use for: Any dose in the series Route: Intramuscular (IM) injection | DTaP-IPV-HepB (Pediatrix) Ages: 6 weeks through 6 years Use for: DTaP and IPV: Doses #1, #2, and/or #3 HepB: Any dose in the series Do NOT use for HepB birth dose Route: Intramuscular (IM) injection |
| DTaP-IPV-Hib (Pentacel) Ages: 6 weeks through 4 years Use for: DTaP and IPV: Doses #1, #2, #3, and/or #4 Hib: Any dose in the series Route: Intramuscular (IM) injection Reconstitute Hib powder ONLY with manufacturer-supplied DTaP-IPV liquid diluent Use immediately after reconstitution Do NOT administer DTaP-IPV w/o Hib | DTaP-IPV-HepB-Hib (Vaxelis) Ages: 6 weeks through 4 years Use for: DTaP and IPV: Doses #1, #2, and/or #3 Hep B: Any dose in the series (Do NOT use for HepB birth dose) Hib: Any dose in the series Route: Intramuscular (IM) injection |
| DTaP-IPV (Quadracel) Ages: 4 years through 6 years Use for: DTaP dose #5 IPV dose #4 or #5 Do NOT use for DTaP doses 1 through 4 OR IPV doses 1 through 3 Route: Intramuscular (IM) injection | |

Diphtheria, Tetanus, and Pertussis Storage and Handling

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| | |
|--|--|
| DTaP (Daptacel) Ages: 6 weeks through 6 years Use for: Any dose in the series Route: Intramuscular (IM) injection | DTaP-IPV (Kinrix) Ages: 4 years through 6 years Use for: DTaP dose #5 IPV dose #4 Do NOT use for DTaP doses 1 through 4 OR IPV doses 1 through 3 Route: Intramuscular (IM) injection |
|--|--|

| | |
|--|--|
| DTaP (Infanrix) Ages: 6 weeks through 6 years Use for: Any dose in the series Route: Intramuscular (IM) injection | DTaP-IPV-HepB (Pediatrix) Ages: 6 weeks through 6 years Use for: DTaP and IPV: Doses #1, #2, and/or #3 HepB: Any dose in the series Do NOT use for HepB birth dose Route: Intramuscular (IM) injection |
|--|--|

| |
|--|
| DTaP-IPV-Hib (Pentacel) Ages: 6 weeks through 4 years Use for: DTaP and IPV: Doses #1, #2, #3, and/or #4 Hib: Any dose in the series Route: Intramuscular (IM) injection Reconstitute Hib powder ONLY with manufacturer-supplied DTaP-IPV liquid diluent Use immediately after reconstitution Do NOT administer DTaP-IPV w/o Hib |
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| DTaP-IPV-HepB-Hib (Vaxelis) Ages: 6 weeks through 4 years Use for: DTaP and IPV: Doses #1, #2, and/or #3 Hep B: Any dose in the series (Do NOT use for HepB birth dose) Hib: Any dose in the series Route: Intramuscular (IM) injection |
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| DTaP-IPV (Quadracel) Ages: 4 years through 6 years Use for: DTaP dose #5 IPV dose #4 or #5 Do NOT use for DTaP doses 1 through 4 OR IPV doses 1 through 3 Route: Intramuscular (IM) injection |
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Diphtheria, Tetanus, and Pertussis Storage and Handling

- Store diphtheria, tetanus, and pertussis vaccines refrigerated between 2°C and 8°C (36°F and 46°F)
- Do not freeze vaccine or expose to freezing temperatures
- For vaccine that require reconstitution, Pentacel[®], the manufacturer packages the diluent and vaccine should be stored together in the refrigerator
- Store in the original packaging

DTaP (Daptacel)
Ages: 6 weeks through 6 years
Use for: Any dose in the series
Route: Intramuscular (IM) injection

DTaP-IPV (Kinrix)
Ages: 4 years through 6 years
Use for: DTaP dose #5
IPV dose #4
Do NOT use for DTaP doses 1 through 4 OR IPV doses 1 through 3
Route: Intramuscular (IM) injection

DTaP (Infanrix)
Ages: 6 weeks through 6 years
Use for: Any dose in the series
Route: Intramuscular (IM) injection

DTaP-IPV-HepB (Pediatrix)
Ages: 6 weeks through 6 years
Use for: DTaP and IPV: Doses #1, #2, and/or #3
HepB: Any dose in the series
Do NOT use for HepB birth dose
Route: Intramuscular (IM) injection

DTaP-IPV-Hib (Pentacel)
Ages: 6 weeks through 4 years
Use for: DTaP and IPV: Doses #1, #2, #3, and/or #4
Hib: Any dose in the series
Route: Intramuscular (IM) injection
Reconstitute Hib powder ONLY with manufacturer-supplied DTaP-IPV liquid diluent
Use immediately after reconstitution
Do NOT administer DTaP-IPV w/o Hib

DTaP-IPV-HepB-Hib (Vaxelis)
Ages: 6 weeks through 4 years
Use for: DTaP and IPV: Doses #1, #2, and/or #3
Hep B: Any dose in the series
(Do NOT use for HepB birth dose)
Hib: Any dose in the series
Route: Intramuscular (IM) injection

DTaP-IPV (Quadracel)
Ages: 4 years through 6 years
Use for: DTaP dose #5
IPV dose #4 or #5
Do NOT use for DTaP doses 1 through 4 OR IPV doses 1 through 3
Route: Intramuscular (IM) injection

Diphtheria, Tetanus, and Pertussis Storage and Handling

- Store diphtheria, tetanus, and pertussis vaccines refrigerated between 2°C and 8°C (36°F and 46°F)
- Do not freeze vaccine or expose to freezing temperatures
- For vaccine that require reconstitution, Pentacel[®], the manufacturer packages the diluent and vaccine should be stored together in the refrigerator
- Store in the original packaging

DTaP (Daptacel)
Ages: 6 weeks through 6 years
Use for: Any dose in the series
Route: Intramuscular (IM) injection

DTaP-IPV (Kinrix)
Ages: 4 years through 6 years
Use for: DTaP dose #5
IPV dose #4
Do NOT use for DTaP doses 1 through 4 OR IPV doses 1 through 3
Route: Intramuscular (IM) injection

DTaP (Infanrix)
Ages: 6 weeks through 6 years
Use for: Any dose in the series
Route: Intramuscular (IM) injection

DTaP-IPV-HepB (Pediatrix)
Ages: 6 weeks through 6 years
Use for: DTaP and IPV: Doses #1, #2, and/or #3
HepB: Any dose in the series
Do NOT use for HepB birth dose
Route: Intramuscular (IM) injection

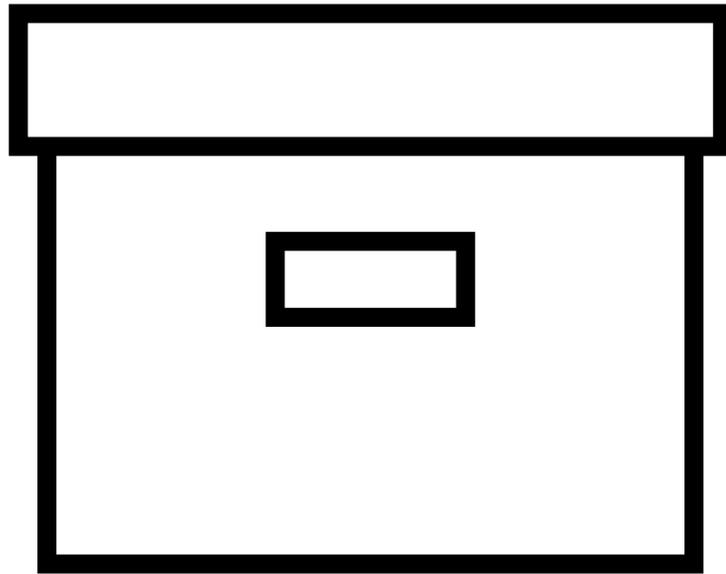
DTaP-IPV-Hib (Pentacel)
Ages: 6 weeks through 4 years
Use for: DTaP and IPV: Doses #1, #2, #3, and/or #4
Hib: Any dose in the series
Route: Intramuscular (IM) injection
Reconstitute Hib powder ONLY with manufacturer-supplied DTaP-IPV liquid diluent
Use immediately after reconstitution
Do NOT administer DTaP-IPV w/o Hib

DTaP-IPV-HepB-Hib (Vaxelis)
Ages: 6 weeks through 4 years
Use for: DTaP and IPV: Doses #1, #2, and/or #3
Hep B: Any dose in the series
(Do NOT use for HepB birth dose)
Hib: Any dose in the series
Route: Intramuscular (IM) injection

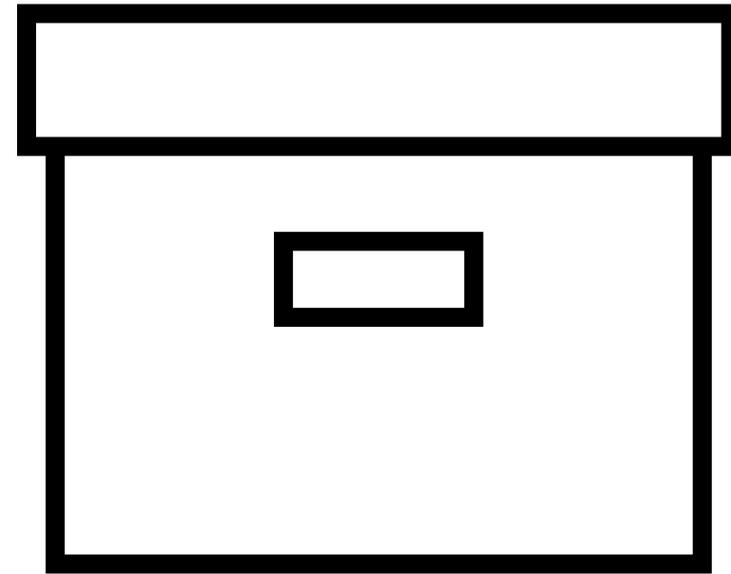
DTaP-IPV (Quadracel)
Ages: 4 years through 6 years
Use for: DTaP dose #5
IPV dose #4 or #5
Do NOT use for DTaP doses 1 through 4 OR IPV doses 1 through 3
Route: Intramuscular (IM) injection

Diphtheria, Tetanus, and Pertussis Storage and Handling

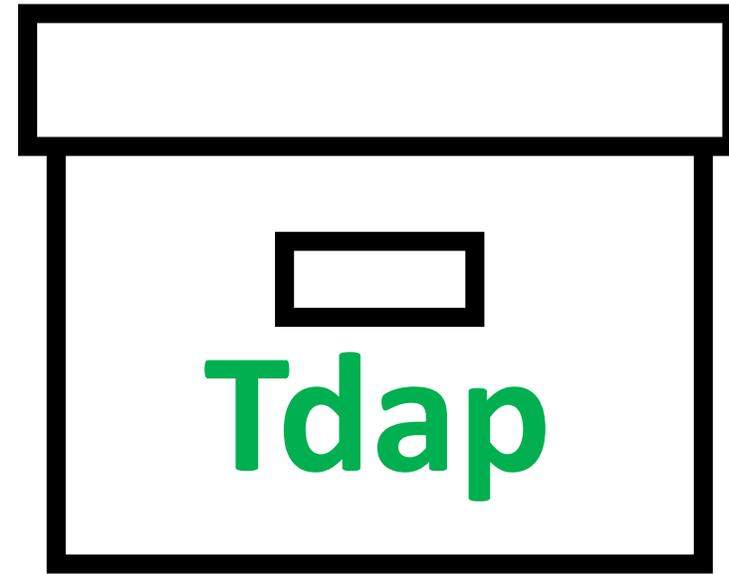
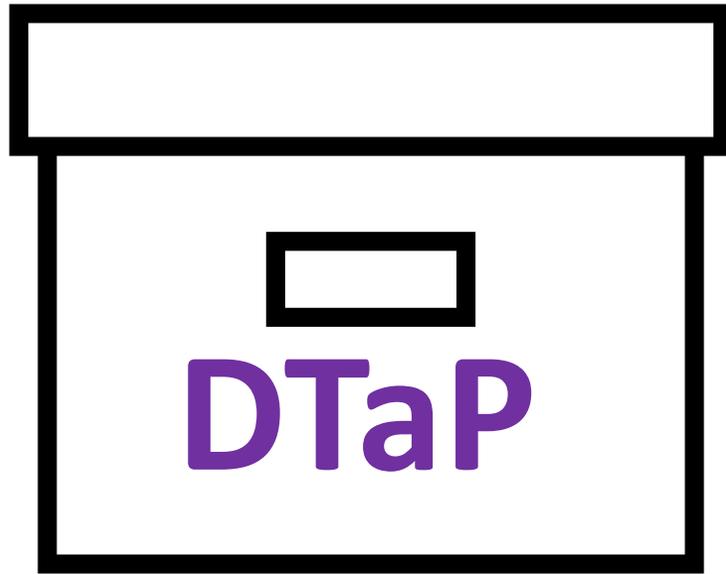
DTaP



Tdap



Diphtheria, Tetanus, and Pertussis Storage and Handling



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- CE credit, go to: <https://tceols.cdc.gov/>
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- CE credit expires: **July 1, 2024**
- CE instructions are available on the **Pink Book Web-on-Demand Series** web page
- Questions and additional help with the online CE system, e-mail CE@cdc.gov

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Thank You From Atlanta!

