Immunization Practices: Update 2018

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Diclosures

- Kristy Brittain has no conflict of interest to report.

Objectives

- Describe recent changes in adult and pediatric immunizations
- Discuss specific storage requirements for vaccines
- Apply immunization recommendations to specific patients

Immunization Practices in US

How are we doing?

IID-12.13 Increase the percentage of health care personnel who are vaccinated annually against seasonal influenza Revised

Health care personnel vaccinated against seasonal influenza (percent, 18+ years)

2020 Baseline (year): 55.8 (2010–11) **2020 Target:** 90.0 **Desired Direction:** ↑ Increase desired

Choose Years

POPULATIONS	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
TOTAL View Chart	**55.8**	**61.3**	**66.9**	**64.9**	**68.6**
SEX View Chart View Disparities					
Male	54.4	58.2	66.3	67.9	68.1
Female	56.4	62.7	66.9	63.8	68.8
RACE/ETHNICITY View Chart View Disparities					
American Indian or Alaska Native only	DSU	DSU	DSU	DSU	DSU
Asian only	64.9	67.7	80.8	77.9	73.8
Native Hawaiian or Other Pacific Islander only	DNC	DNC	DNC	DNC	DNC
Black or African American only	44.5	51.7	51.5	49.4	59.9
White only	56.8	62.5	68.5	67.3	69.9
2 or more races	53.2	69.5	64.9	50.6	62.6
Hispanic or Latino	45.2	55.0	59.5	65.6	59.3
Not Hispanic or Latino	57.0	62.3	67.7	64.9	69.6
Black or African American only, not Hispanic or Latino	43.7	51.8	52.1	50.2	59.9
White only, not Hispanic or Latino	58.6	63.6	69.8	66.9	71.3

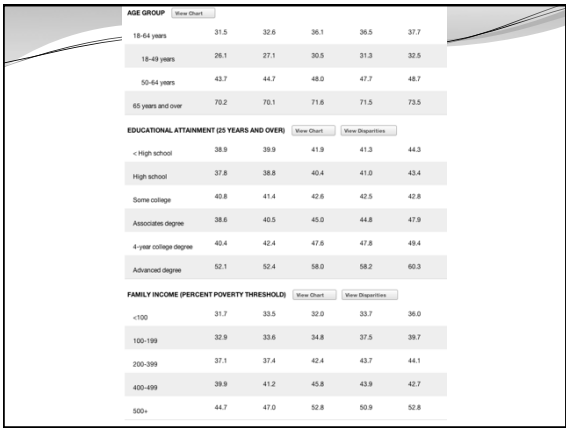
IID-12.12 Increase the percentage of adults aged 18 and older who are vaccinated annually against seasonal influenza Revised

Adults vaccinated against seasonal influenza (percent, 18+ years)

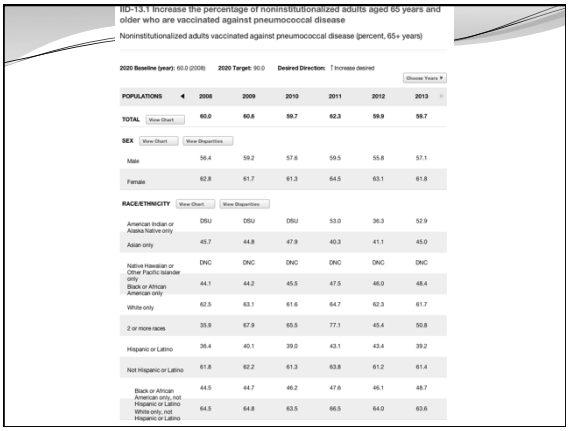
2020 Baseline (year): 38.1 (2010–11) **2020 Target:** 70.0 **Desired Direction:** ↑ Increase desired

Choose Years

POPULATIONS	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
TOTAL View Chart	**38.1**	**39.2**	**42.6**	**42.9**	**44.6**
SEX View Chart View Disparities					
Male	34.2	35.4	38.9	38.5	40.0
Female	41.8	42.8	46.1	47.0	48.9
RACE/ETHNICITY View Chart View Disparities					
American Indian or Alaska Native only	39.2	36.1	39.9	45.2	49.5
Asian only	38.3	41.6	48.0	44.2	48.4
Native Hawaiian or Other Pacific Islander only	DNC	DNC	DNC	DNC	DNC
Black or African American only	32.2	33.3	33.4	36.4	37.4
White only	39.1	40.2	43.8	44.0	45.6
2 or more races	31.8	31.0	36.4	36.1	37.6
Hispanic or Latino	28.8	28.3	30.5	32.9	33.3
Not Hispanic or Latino	---	---	---	---	---
Black or African American only, not Hispanic or Latino	32.1	34.0	33.5	36.5	37.7
White only, not Hispanic or Latino	41.1	42.4	46.5	46.4	48.2



AGE GROUP					
18-64 years	31.5	32.6	36.1	36.5	37.7
18–49 years	26.1	27.1	30.5	31.3	32.5
50–64 years	43.7	44.7	48.0	47.7	48.7
65 years and over	70.2	70.1	71.6	71.5	73.5
EDUCATIONAL ATTAINMENT (25 YEARS AND OVER)					
< High school	38.9	39.9	41.9	41.3	44.3
High school	37.8	38.8	40.4	41.0	43.4
Some college	40.8	41.4	42.6	42.5	42.8
Associates degree	38.6	40.5	45.0	44.8	47.9
4-year college degree	40.4	42.4	47.6	47.8	49.4
Advanced degree	52.1	52.4	58.0	58.2	60.3
FAMILY INCOME (PERCENT POVERTY THRESHOLD)					
<100	31.7	33.5	32.0	33.7	36.0
100–199	32.9	33.6	34.8	37.5	39.7
200–399	37.1	37.4	42.4	43.7	44.1
400–499	39.9	41.2	45.8	43.9	42.7
500+	44.7	47.0	52.8	50.9	52.8

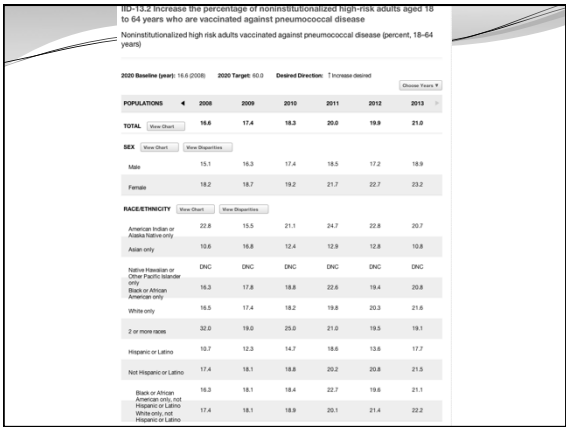


IID-13.1 Increase the percentage of noninstitutionalized adults aged 65 years and older who are vaccinated against pneumococcal disease

Noninstitutionalized adults vaccinated against pneumococcal disease (percent, 65+ years)

2020 Baseline (year): 60.0 (2008) **2020 Target:** 90.0 **Desired Direction:** ↑ Increase desired

POPULATIONS	2008	2009	2010	2011	2012	2013
TOTAL	**60.0**	**60.6**	**59.7**	**62.3**	**59.9**	**59.7**
SEX						
Male	56.4	59.2	57.6	59.5	55.8	57.1
Female	62.8	61.7	61.3	64.5	63.1	61.8
RACE/ETHNICITY						
American Indian or Alaska Native only	DSU	DSU	DSU	53.0	36.3	52.9
Asian only	45.7	44.8	47.9	40.3	41.1	45.0
Native Hawaiian or Other Pacific Islander only	DNC	DNC	DNC	DNC	DNC	DNC
Black or African American only	44.1	44.2	45.5	47.5	46.0	48.4
White only	62.5	63.1	61.8	64.7	62.3	61.7
2 or more races	35.9	67.9	65.5	77.1	45.4	50.8
Hispanic or Latino	36.4	40.1	39.0	43.1	43.4	39.2
Not Hispanic or Latino	61.8	62.2	61.3	63.8	61.2	61.4
Black or African American only, not Hispanic or Latino	44.5	44.7	46.2	47.6	46.1	48.7
White only, not Hispanic or Latino	64.5	64.8	63.5	66.5	64.0	63.6

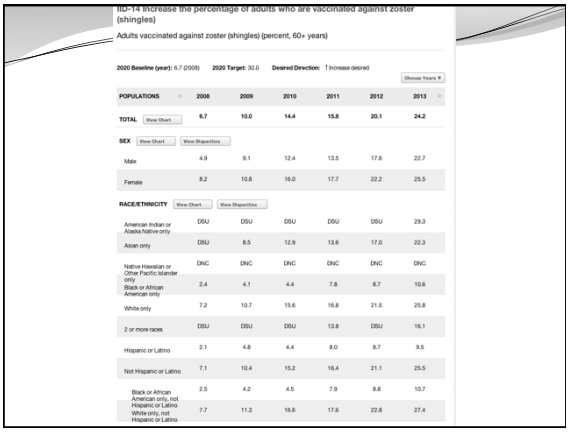


IID-13.2 Increase the percentage of noninstitutionalized high-risk adults aged 18 to 64 years who are vaccinated against pneumococcal disease

Noninstitutionalized high risk adults vaccinated against pneumococcal disease (percent, 18–64 years)

2020 Baseline (year): 16.6 (2008) **2020 Target:** 60.0 **Desired Direction:** ↑ Increase desired

POPULATIONS	2008	2009	2010	2011	2012	2013
TOTAL	**16.6**	**17.4**	**18.3**	**20.0**	**19.9**	**21.0**
SEX						
Male	15.1	16.3	17.4	18.5	17.2	18.9
Female	18.2	18.7	19.2	21.7	22.7	23.2
RACE/ETHNICITY						
American Indian or Alaska Native only	22.8	15.5	21.1	24.7	22.8	20.7
Asian only	10.6	16.8	12.4	12.9	12.8	10.8
Native Hawaiian or Other Pacific Islander only	DNC	DNC	DNC	DNC	DNC	DNC
Black or African American only	16.3	17.8	18.8	22.6	19.4	20.8
White only	16.5	17.4	18.2	19.8	20.3	21.6
2 or more races	32.0	19.0	25.0	21.0	19.5	19.1
Hispanic or Latino	10.7	12.3	14.7	18.6	13.6	17.7
Not Hispanic or Latino	17.4	18.1	18.8	20.2	20.8	21.5
Black or African American only, not Hispanic or Latino	16.3	18.1	18.4	22.7	19.6	21.1
White only, not Hispanic or Latino	17.4	18.1	18.9	20.1	21.4	22.2



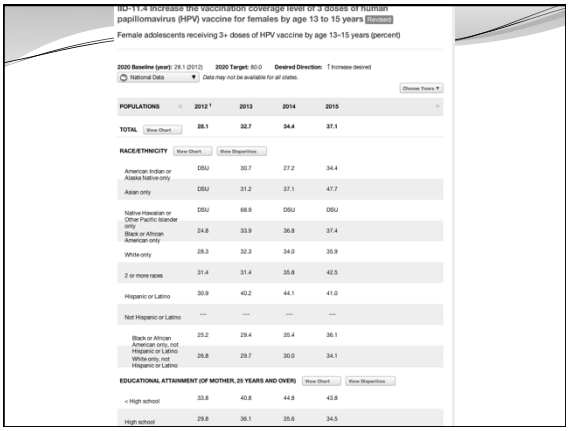
IID-14 Increase the percentage of adults who are vaccinated against zoster (shingles)

Adults vaccinated against zoster (shingles) (percent, 60+ years)

2020 Baseline (year): 6.7 (2008) **2020 Target:** 30.0 **Desired Direction:** ↑ Increase desired

Choose Years

POPULATIONS	2006	2009	2010	2011	2012	2013
TOTAL View Chart	**6.7**	**10.0**	**14.4**	**15.8**	**20.1**	**24.2**
SEX View Chart View Disparities						
Male	4.9	9.1	12.4	13.5	17.6	22.7
Female	8.2	10.8	16.0	17.7	22.2	25.5
RACE/ETHNICITY View Chart View Disparities						
American Indian or Alaska Native only	DSU	DSU	DSU	DSU	DSU	29.3
Asian only	DSU	8.5	12.9	13.6	17.0	22.3
Native Hawaiian or Other Pacific Islander only	DNC	DNC	DNC	DNC	DNC	DNC
Black or African American only	2.4	4.1	4.4	7.8	8.7	10.6
White only	7.2	10.7	15.6	16.8	21.5	25.8
2 or more races	DSU	DSU	DSU	13.8	DSU	16.1
Hispanic or Latino	2.1	4.8	4.4	8.0	8.7	9.5
Not Hispanic or Latino	7.1	10.4	15.2	16.4	21.1	25.5
Black or African American only, not Hispanic or Latino	2.5	4.2	4.5	7.9	8.8	10.7
White only, not Hispanic or Latino	7.7	11.3	16.6	17.6	22.8	27.4



IID-11.4 Increase the vaccination coverage level of 3 doses of human papillomavirus (HPV) vaccine for females by age 13 to 15 years Revised

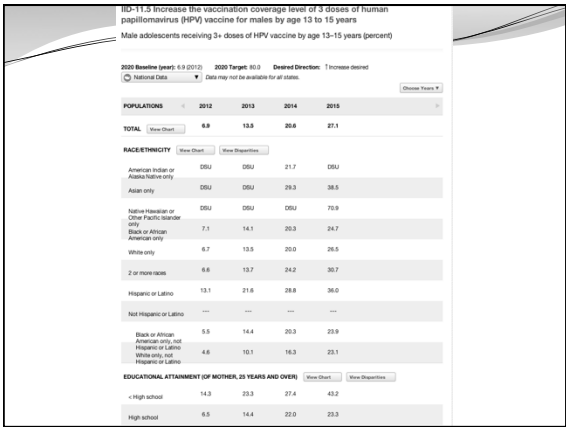
Female adolescents receiving 3+ doses of HPV vaccine by age 13–15 years (percent)

2020 Baseline (year): 28.1 (2012) **2020 Target:** 80.0 **Desired Direction:** ↑ Increase desired

National Data — *Data may not be available for all states.*

Choose Years

POPULATIONS	2012 [1]	2013	2014	2015
TOTAL View Chart	**28.1**	**32.7**	**34.4**	**37.1**
RACE/ETHNICITY View Chart View Disparities				
American Indian or Alaska Native only	DSU	30.7	27.2	34.4
Asian only	DSU	31.2	37.1	47.7
Native Hawaiian or Other Pacific Islander only	DSU	68.9	DSU	DSU
Black or African American only	24.8	33.9	36.8	37.4
White only	28.3	32.3	34.0	35.9
2 or more races	31.4	31.4	35.8	42.5
Hispanic or Latino	30.9	40.2	44.1	41.0
Not Hispanic or Latino	---	---	---	---
Black or African American only, not Hispanic or Latino	25.2	29.4	35.4	36.1
White only, not Hispanic or Latino	26.8	29.7	30.0	34.1
EDUCATIONAL ATTAINMENT (OF MOTHER, 25 YEARS AND OVER) View Chart View Disparities				
< High school	33.8	40.8	44.8	43.8
High school	29.8	36.1	35.6	34.5



IID-11.5 Increase the vaccination coverage level of 3 doses of human papillomavirus (HPV) vaccine for males by age 13 to 15 years

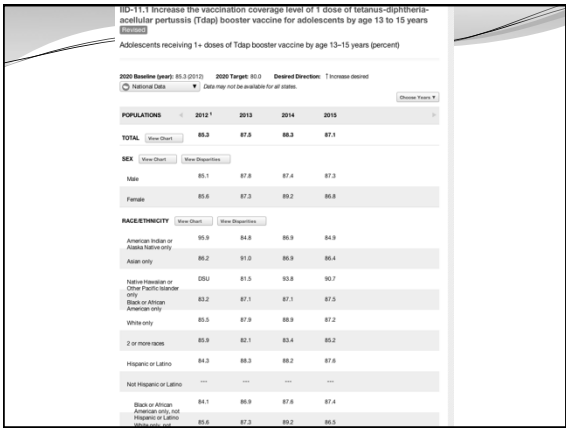
Male adolescents receiving 3+ doses of HPV vaccine by age 13–15 years (percent)

2020 Baseline (year): 6.9 (2012) **2020 Target:** 80.0 **Desired Direction:** ↑ Increase desired

National Data — *Data may not be available for all states.*

Choose Years

POPULATIONS	2012	2013	2014	2015
TOTAL View Chart	**6.9**	**13.5**	**20.6**	**27.1**
RACE/ETHNICITY View Chart View Disparities				
American Indian or Alaska Native only	DSU	DSU	21.7	DSU
Asian only	DSU	DSU	29.3	38.5
Native Hawaiian or Other Pacific Islander only	DSU	DSU	DSU	70.9
Black or African American only	7.1	14.1	20.3	24.7
White only	6.7	13.5	20.0	26.5
2 or more races	6.6	13.7	24.2	30.7
Hispanic or Latino	13.1	21.6	28.8	36.0
Not Hispanic or Latino	---	---	---	---
Black or African American only, not Hispanic or Latino	5.5	14.4	20.3	23.9
White only, not Hispanic or Latino	4.6	10.1	16.3	23.1
EDUCATIONAL ATTAINMENT (OF MOTHER, 25 YEARS AND OVER) View Chart View Disparities				
< High school	14.3	23.3	27.4	43.2
High school	6.5	14.4	22.0	23.3



IID-11.1 Increase the vaccination coverage level of 1 dose of tetanus-diphtheria-acellular pertussis (Tdap) booster vaccine for adolescents by age 13 to 15 years

Revised

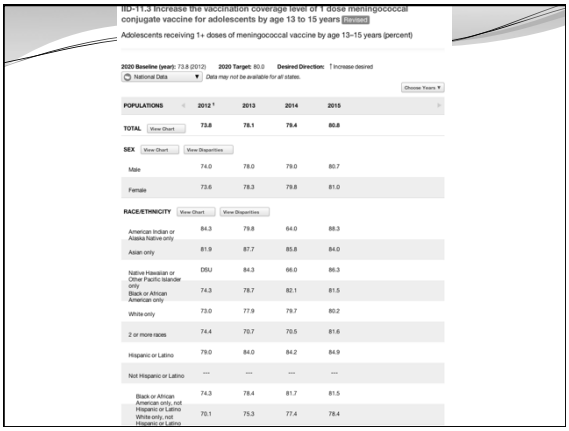
Adolescents receiving 1+ doses of Tdap booster vaccine by age 13–15 years (percent)

2020 Baseline (year): 85.3 (2012) **2020 Target:** 80.0 **Desired Direction:** ↑ Increase desired

National Data — *Data may not be available for all states.*

Choose Years

POPULATIONS	2012 †	2013	2014	2015
TOTAL View Chart	**85.3**	**87.5**	**88.3**	**87.1**
SEX View Chart · View Disparities				
Male	85.1	87.8	87.4	87.3
Female	85.6	87.3	89.2	86.8
RACE/ETHNICITY View Chart · View Disparities				
American Indian or Alaska Native only	95.9	84.8	86.9	84.9
Asian only	86.2	91.0	86.9	86.4
Native Hawaiian or Other Pacific Islander only	DSU	81.5	93.8	90.7
Black or African American only	83.2	87.1	87.1	87.5
White only	85.5	87.9	88.9	87.2
2 or more races	85.9	82.1	83.4	85.2
Hispanic or Latino	84.3	88.3	88.2	87.6
Not Hispanic or Latino	---	---	---	---
Black or African American only, not Hispanic or Latino	84.1	86.9	87.6	87.4
White only, not Hispanic or Latino	85.6	87.3	89.2	86.5



IID-11.3 Increase the vaccination coverage level of 1 dose meningococcal conjugate vaccine for adolescents by age 13 to 15 years Revised

Adolescents receiving 1+ doses of meningococcal vaccine by age 13–15 years (percent)

2020 Baseline (year): 73.8 (2012) **2020 Target:** 80.0 **Desired Direction:** ↑ Increase desired

National Data — *Data may not be available for all states.*

Choose Years

POPULATIONS	2012 †	2013	2014	2015
TOTAL View Chart	**73.8**	**78.1**	**79.4**	**80.8**
SEX View Chart · View Disparities				
Male	74.0	78.0	79.0	80.7
Female	73.6	78.3	79.8	81.0
RACE/ETHNICITY View Chart · View Disparities				
American Indian or Alaska Native only	84.3	79.8	64.0	88.3
Asian only	81.9	87.7	85.8	84.0
Native Hawaiian or Other Pacific Islander only	DSU	84.3	66.0	86.3
Black or African American only	74.3	78.7	82.1	81.5
White only	73.0	77.9	79.7	80.2
2 or more races	74.4	70.7	70.5	81.6
Hispanic or Latino	79.0	84.0	84.2	84.9
Not Hispanic or Latino	---	---	---	---
Black or African American only, not Hispanic or Latino	74.3	78.4	81.7	81.5
White only, not Hispanic or Latino	70.1	75.3	77.4	78.4

Tips in Improving Vaccine Rates

- Communicating with other health care providers
  - Direct referral for services
- Staying up-to-date with recommendations

Patty Watkins

Age: 65 years	Gender: Female
PMH	Type 2 diabetes x 4 years Hypertension x 10 years
Medications	Metformin 850mg twice daily Lantus 15 units SQ QHS Lisinopril 40 mg once daily
Vaccine History	Influenza (IIV3) Oct 2016 Influenza (IIV3) Nov 2015 Influenza (IIV3) Dec 2014 Zoster (Zostavax) 1 dose Dec 2014
Other information	NKDA

Patty Watkins

- How will we determine what vaccines Patty needs?
- Where can we find this information?

Figure 2. Vaccines that might be indicated for adults aged 19 years or older based on medical and other indications[1]

VACCINE ▼ INDICATION ►	Pregnancy	Immunocompromising conditions (excluding HIV infection)[3,4,5,6,7]	HIV infection CD4+ count (cells/μL)[3,4,5,6] ≤ 200	HIV infection CD4+ count (cells/μL)[3,4,5,6] ≥ 200	Men who have sex with men (MSM)	Kidney failure, end-stage renal disease, on hemodialysis	Heart disease, chronic lung disease, chronic alcoholism	Asplenia and persistent complement component deficiencies[8,9,10]	Chronic liver disease	Diabetes	Healthcare personnel
Influenza[1,2]	1 dose Inactivated influenza vaccine (IIV) any pregnancy	1 dose annually									
Tetanus, diphtheria, pertussis (Td/Tdap)[1,2]	Substitute Tdap for Td once, then Td booster every 10 yrs										
Varicella[1,6]	Contraindicated	2 doses									
Human papillomavirus (HPV) Female[1,3]	3 doses through age 26 yrs			3 doses through age 26 yrs							
Human papillomavirus (HPV) Male[1,3]	3 doses through age 26 yrs			3 doses through age 21 yrs							
Zoster[6]	Contraindicated	1 dose									
Measles, mumps, rubella (MMR)[1,7]	Contraindicated	1 or 2 doses depending on indication									
Pneumococcal 13-valent conjugate (PCV13)[1,8]	1 dose										
Pneumococcal polysaccharide (PPSV23)[1,8]	1, 2, or 3 doses depending on indication										
Hepatitis A[1,9]	2 or 3 doses depending on vaccine										
Hepatitis B[1,10]	3 doses										
Meningococcal 4-valent conjugate (MenACWY) or polysaccharide (MPSV4)[1,11]	1 or more doses depending on indication										
Meningococcal B (MenB)[1,11]	2 or 3 doses depending on vaccine										
Haemophilus influenzae type b (Hib)[1,12]	3 doses post-HSCT (recipients only)	1 dose									

Covered by the Vaccine Injury Compensation Program

Recommended for all persons who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection; zoster vaccine is recommended regardless of past episode of zoster

Recommended for persons with a risk factor (medical, occupational, lifestyle, or other indication)

No recommendation

Contraindicated

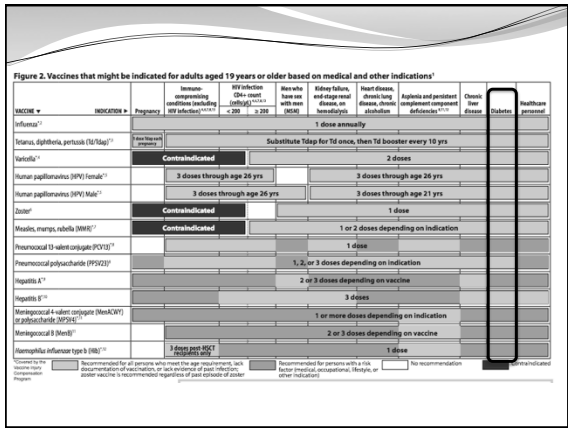


Figure 2. Vaccines that might be indicated for adults aged 19 years or older based on medical and other indications[1]

VACCINE ▼ INDICATION ►	Pregnancy	Immuno-compromising conditions (excluding HIV infection)[4,5,6,7,8]	HIV infection CD4+ count (cells/μL)[4,5,6,8,9] < 200	HIV infection CD4+ count (cells/μL)[4,5,6,8,9] ≥ 200	Men who have sex with men (MSM)	Kidney failure, end-stage renal disease, on hemodialysis	Heart disease, chronic lung disease, chronic alcoholism	Asplenia and persistent complement component deficiencies[8,11,13]	Chronic liver disease	Diabetes	Healthcare personnel
Influenza[2,3]	1 dose annually										
Tetanus, diphtheria, pertussis (Td/Tdap)[2,3]	If dose Tdap not given pregnancy	Substitute Tdap for Td once, then Td booster every 10 yrs									
Varicella[2,4]	Contraindicated	2 doses									
Human papillomavirus (HPV) Female[2,3]	3 doses through age 26 yrs			3 doses through age 26 yrs							
Human papillomavirus (HPV) Male[2,3]	3 doses through age 26 yrs			3 doses through age 21 yrs							
Zoster[2]	Contraindicated			1 dose							
Measles, mumps, rubella (MMR)[2,7]	Contraindicated			1 or 2 doses depending on indication							
Pneumococcal 13-valent conjugate (PCV13)[2,9]	1 dose										
Pneumococcal polysaccharide (PPSV23)[2]	1, 2, or 3 doses depending on indication										
Hepatitis A[2,9]	2 or 3 doses depending on vaccine										
Hepatitis B[2,10]	3 doses										
Meningococcal 4-valent conjugate (MenACWY) or polysaccharide (MPSV4)[2,12]	1 or more doses depending on indication										
Meningococcal B (MenB)[2]	2 or 3 doses depending on vaccine										
Haemophilus influenzae type b (Hib)[2,13]	3 doses post-HSCT recipients only	1 dose									

[1]Covered by the Vaccine Injury Compensation Program

Recommended for all persons who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection; zoster vaccine is recommended regardless of past episode of zoster

Recommended for persons with a risk factor (medical, occupational, lifestyle, or other indication)

No recommendation

Contraindicated

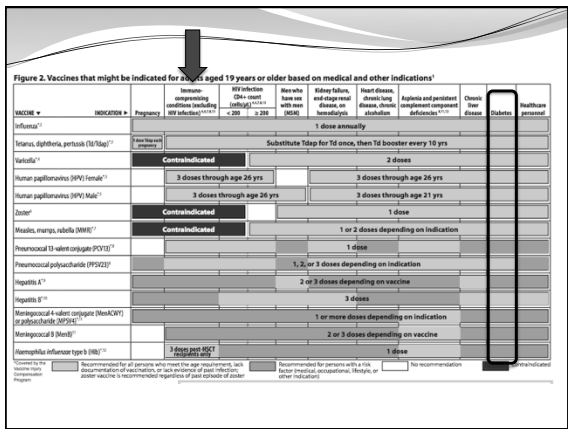


Figure 2. Vaccines that might be indicated for adults aged 19 years or older based on medical and other indications[1]

VACCINE ▼ INDICATION ►	Pregnancy	Immuno-compromising conditions (excluding HIV infection)[4,5,6,7,8]	HIV infection CD4+ count (cells/μL)[4,5,6,8,9] < 200	HIV infection CD4+ count (cells/μL)[4,5,6,8,9] ≥ 200	Men who have sex with men (MSM)	Kidney failure, end-stage renal disease, on hemodialysis	Heart disease, chronic lung disease, chronic alcoholism	Asplenia and persistent complement component deficiencies[8,11,13]	Chronic liver disease	Diabetes	Healthcare personnel
Influenza[2,3]	1 dose annually										
Tetanus, diphtheria, pertussis (Td/Tdap)[2,3]	If dose Tdap not given pregnancy	Substitute Tdap for Td once, then Td booster every 10 yrs									
Varicella[2,4]	Contraindicated	2 doses									
Human papillomavirus (HPV) Female[2,3]	3 doses through age 26 yrs			3 doses through age 26 yrs							
Human papillomavirus (HPV) Male[2,3]	3 doses through age 26 yrs			3 doses through age 21 yrs							
Zoster[2]	Contraindicated			1 dose							
Measles, mumps, rubella (MMR)[2,7]	Contraindicated			1 or 2 doses depending on indication							
Pneumococcal 13-valent conjugate (PCV13)[2,9]	1 dose										
Pneumococcal polysaccharide (PPSV23)[2]	1, 2, or 3 doses depending on indication										
Hepatitis A[2,9]	2 or 3 doses depending on vaccine										
Hepatitis B[2,10]	3 doses										
Meningococcal 4-valent conjugate (MenACWY) or polysaccharide (MPSV4)[2,12]	1 or more doses depending on indication										
Meningococcal B (MenB)[2]	2 or 3 doses depending on vaccine										
Haemophilus influenzae type b (Hib)[2,13]	3 doses post-HSCT recipients only	1 dose									

[1]Covered by the Vaccine Injury Compensation Program

Recommended for all persons who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection; zoster vaccine is recommended regardless of past episode of zoster

Recommended for persons with a risk factor (medical, occupational, lifestyle, or other indication)

No recommendation

Contraindicated

Vaccination in Diabetes

ADA Standards of Care Guidelines (2018)
Recommendation:

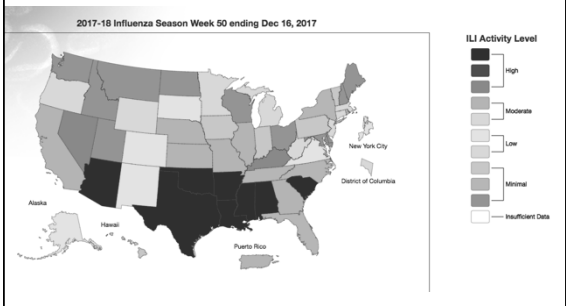
- Provide routine vaccinations for children and adults with diabetes as for the general population according to age-related recommendations.

Figure 1. Recommended immunization schedule for adults aged 19 years or older, by vaccine and age group[1]

VACCINE ▼ AGE GROUP ▶	19-21 years	22-26 years	27-49 years	50-59 years	60-64 years	≥ 65 years
Influenza[2,3]	1 dose annually					
Tetanus, diphtheria, pertussis (Td/Tdap)[2,3]	Substitute Tdap for Td once, then Td booster every 10 yrs					
Varicella[2,4]	2 doses					
Human papillomavirus [HPV]: Female[2,5]	3 doses					
Human papillomavirus [HPV]: Male[2,5]	3 doses					
Zoster[6]					1 dose	
Measles, mumps, rubella (MMR)[2,7]	1 or 2 doses depending on indication					
Pneumococcal 13-valent conjugate (PCV13)[2,8]					1 dose	
Pneumococcal 23-valent polysaccharide (PPSV23)[9]	1 or 2 doses depending on indication					1 dose
Hepatitis A[2,10]	2 or 3 doses depending on vaccine					
Hepatitis B[2,11]	3 doses					
Meningococcal 4-valent conjugate (MenACWY) or polysaccharide (MPSV4)[2,12]	1 or more doses depending on indication					
Meningococcal B (MenB)[2,13]	2 or 3 doses depending on vaccine					
Haemophilus influenzae type b (Hib)[2,14]	1 or 3 doses depending on indication					

Vaccine Update: Influenza

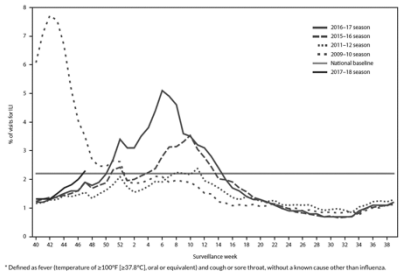
Flu Season 2017-2018



http://www.cdc.gov/flu/weekly/

Flu Season 2017-2018

FIGURE 4. Percentage of outpatient visits for influenza-like illness (ILI)* reported to CDC, by surveillance week — U.S. Outpatient Influenza-Like Illness Surveillance Network, 2017–18 influenza season and selected previous influenza seasons†



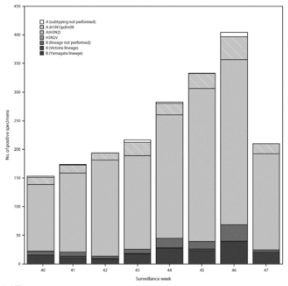
* Defined as fever (temperature of ≥100°F [≥37.8°C], oral or equivalent) and cough or sore throat, without a known cause other than influenza.

† As of December 1, 2017.

http://www.cdc.gov/flu/weekly/

Flu Season 2017-2018

FIGURE 2. Number* of respiratory specimens testing positive for influenza reported by public health laboratories, by influenza virus type, subtype/lineage, and surveillance week — United States, October 1–November 25, 2017†



* N = 1,970.

† As of December 1, 2017.

2017-2018 Influenza Formula

Trivalent vaccine includes:

- A/Michigan/45/2015 (H1N1)
- A/Hong Kong/4801/2014 (H3N2)
- B/Brisbane/60/2008

Quadrivalent includes these plus:

- B/Phuket/3073/2013

http://www.who.int/influenza/vaccines/virus/recommendations/2017_18_north/en/

Influenza Recommendations

- Annual vaccination for all persons aged 6 months and older who do not have any contraindications
  - Should occur before onset of influenza activity in community
  - Begin vaccinating as soon as the vaccine becomes available and by October if possible
- Children 6 months to 8 years should receive 2 doses if this is the first year the vaccine is received
  - Second dose should be given 4 weeks after initial dose

Influenza Vaccine

Live attenuated influenza vaccine (LAIV)
•NOT CURRENTLY RECOMMENDED!

Inactivated influenza vaccine (IIV)
•Contains "dead" virus
•Unable to cause influenza
•Contains 3 (trivalent) or 4 (quadrivalent) strains

Appropriate Vaccine Selection

- Age restriction
- IIV_3 vs IIV_4
- Egg allergy?
- Specific vaccine eligibility
  - Fluad
  - Fluzone HD
- Patient preference
  - Needle fear

Brand (Manufacturer)	Type	Route of Admin	Approved for ages
Afluria Afluria Quad (Seqirus)	IIV3 IIV4	IM	9+ years 18+ years
Fluad (Seqirus)	aIIV3	IM	65+ years
Fluarix Quad (GSK)	IIV4	IM	6+ months (PFS) 3+ years (MDV)
FluBlok FluBlok Quad (Protein Sciences)	RIV3 RIV4	IM	18+ years
Flucelvax Quad (Novartis)	ccIIV4	IM	4+ years
FluLaval FluLaval Quad (ID Biomed Corp)	IIV3 IIV4	IM	3+ years
~~FluMist Quad~~ (MedImmune)	~~LAIV4~~	~~Intranasal~~	~~2-49 years~~
Fluvirin (Seqirus)	IIV3	IM	4+ years
Fluzone Quad Fluzone ID Fluzone HD	IIV4 IIV4 IIV3-HD	IM Intradermal IM	6+ months 18-64 years 65+ years

Patty Watkins

Age: 65 years	Gender: Female
PMH	Type 2 diabetes x 4 years Hypertension x 10 years
Medications	Metformin 850mg twice daily Lantus 15 units SQ QHS Lisinopril 40 mg once daily
Vaccine History	Influenza (IIV3) Oct 2016 Influenza (IIV3) Nov 2015 Influenza (IIV3) Dec 2014 Zoster (Zostavax) 1 dose Dec 2014
Other information	NKDA

Patty Watkins

- What are we going to recommend to Patty for her influenza vaccination?

Brand (Manufacturer)	Type	Route of Admin	Approved for ages
Afluria Afluria Quad (Seqirus)	IIV3 IIV4	IM	9+ years 18+ years
Fluad (Seqirus)	aIIV3	IM	65+ years
Fluarix Quad (GSK)	IIV4	IM	6+ months (PFS) 3+ years (MDV)
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Patty Watkins

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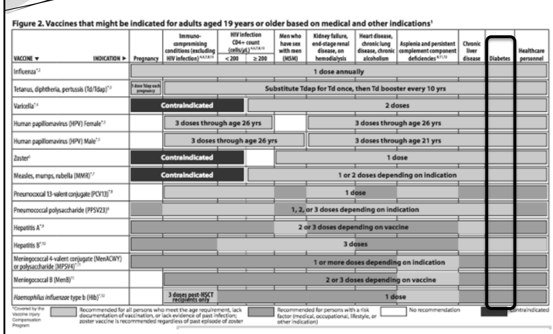
Other information	NKDA



Influenza

Where should influenza vaccines be stored in the pharmacy?

A.Fridge

B.Freezer

C.Shelf (room-temperature)

Influenza

How soon should patients start receiving the influenza vaccine?

A.As soon as its available

B.September 1st

C.October 1st

D.October 15th

Influenza

What is the most appropriate starting age for influenza vaccination in children?

A.3 months

B.6 months

C.12 months

D.18 months

Influenza

How can we screen patients for influenza vaccine?

What techniques are used in your practice to increase vaccination rates?

Vaccine Update: Pneumococcal

Types of Pneumococcal Vaccine

Pneumococcal Conjugate Vaccine (PCV13) – targets 13 pneumococcal serotypes that cause disease in children – PCV is designed to be administered to children age 5 and younger

- Replaced PCV7

Pneumococcal Polysaccharide Vaccine (PPSV23) – contains 23 pneumococcal bacterial serotypes know to cause 85%-90% of infections

- Used in adults only as children will not mount an effective immune response to PPSV

Pneumococcal Recommendations

PCV13 recommended for:

- Children <5 years old
- Adults 65+ years old
- Age 6 to 64 years old with certain medical conditions resulting in immunosuppression

Immunocompromised =
HIV infection
Chronic renal failure
Organ transplant
Leukemia
Lymphoma

Is Patty a candidate for PCV13?

Pneumococcal Recommendations

PCV13 recommended for:

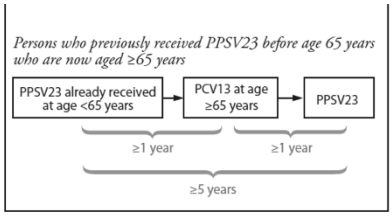
- Children <5 years old
- Adults 65+ years old
- Age 6 to 64 years old with certain medical conditions resulting in immunosuppression

PPSV23 recommended for:

- Adults 65+ years old
- Age 2+ years old with high risk for pneumococcal disease such as sickle cell disease and HIV infection
- Age 19 to 64 years old who smoke cigarettes or have asthma, including diabetes

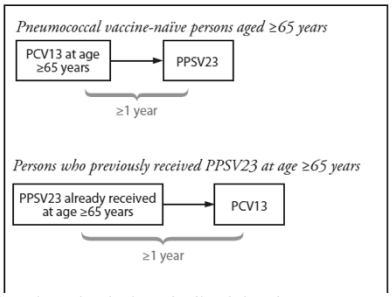
Is Patty a candidate for PPSV23?

Pneumococcal Intervals



http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6434a4.htm

Pneumococcal Intervals



http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6434a4.htm

TABLE. Medical conditions or other indications for administration of PCV13,* and indications for PPSV23† administration and revaccination for children aged 6–18 years§

Risk group	Underlying medical condition	PCV13	PPSV23	
		Recommended	Recommended	Revaccination 5 yrs after first dose
Immunocompetent persons	Chronic heart disease¶		✓	
	Chronic lung disease**		✓	
	Diabetes mellitus		✓	
	Cerebrospinal fluid leaks	✓	✓	
	Cochlear implants	✓	✓	
	Alcoholism		✓	
	Chronic liver disease		✓	
	Cigarette smoking		✓	
Persons with functional or anatomic asplenia	Sickle cell disease/other hemaglobinopathies	✓	✓	✓
	Congenital or acquired asplenia	✓	✓	✓
Immunocompromised persons	Congenital or acquired immunodeficiencies††	✓	✓	✓
	Human immunodeficiency virus infection	✓	✓	✓
	Chronic renal failure	✓	✓	✓
	Nephrotic syndrome	✓	✓	✓
	Leukemia	✓	✓	✓
	Lymphoma	✓	✓	✓
	Hodgkin disease	✓	✓	✓
	Generalized malignancy	✓	✓	✓
	Iatrogenic immunosuppression§§	✓	✓	✓
	Solid organ transplant	✓	✓	✓
	Multiple myeloma	✓	✓	✓

Patty Watkins

Age: 65 years	Gender: Female
PMH	Type 2 diabetes x 4 years Hypertension x 10 years
Medications	Metformin 850mg twice daily Lantus 15 units SQ QHS Lisinopril 40 mg once daily
Vaccine History	Influenza (IIV3) Oct 2016 Influenza (IIV3) Nov 2015 Influenza (IIV3) Dec 2014 Zoster (Zostavax) 1 dose Dec 2014
Other information	NKDA

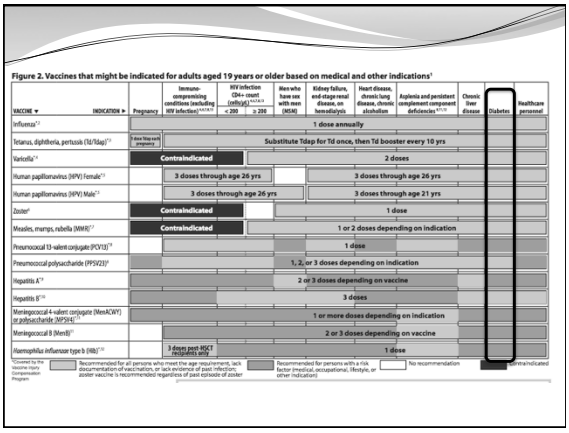


Figure 2. Vaccines that might be indicated for adults aged 19 years or older based on medical and other indications[1]

VACCINE ▼ / INDICATION ▶	Pregnancy	Immuno-compromising conditions (excluding HIV infection)[1,4,5,16,17]	HIV infection (CD4+ count (cells/μL))[1,4,5,16,17] < 200	HIV infection (CD4+ count (cells/μL))[1,4,5,16,17] ≥ 200	Men who have sex with men (MSM)	Kidney failure, end-stage renal disease, on hemodialysis	Heart disease, chronic lung disease, chronic alcoholism	Asplenia and persistent complement component deficiencies[4,15,19]	Chronic liver disease	Diabetes	Healthcare personnel
Influenza[1,2]	1 dose annually										
Tetanus, diphtheria, pertussis (Td/Tdap)[1,3]	Tdap 1 dose each pregnancy	Substitute Tdap for Td once, then Td booster every 10 yrs									
Varicella[1,4]	Contraindicated	2 doses									
Human papillomavirus (HPV) Female[1,5]	3 doses through age 26 yrs			3 doses through age 26 yrs							
Human papillomavirus (HPV) Male[1,6]	3 doses through age 26 yrs			3 doses through age 21 yrs							
Zoster[8]	Contraindicated			1 dose							
Measles, mumps, rubella (MMR)[1,7]	Contraindicated	1 or 2 doses depending on indication									
Pneumococcal 13-valent conjugate (PCV13)[1,9]	1 dose										
Pneumococcal polysaccharide (PPSV23)[1]	1, 2, or 3 doses depending on indication										
Hepatitis A[1,10]	2 or 3 doses depending on vaccine										
Hepatitis B[1,10]	3 doses										
Meningococcal 4-valent conjugate (MenACWY) or polysaccharide (MPSV4)[1,11]	1 or more doses depending on indication										
Meningococcal B (MenB)[1]	2 or 3 doses depending on vaccine										
Haemophilus influenzae type b (Hib)[1,12]	3 doses post-HSCT recipients only	1 dose									

*Covered by the Vaccine Injury Compensation Program

Recommended for all persons who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection; zoster vaccine is recommended regardless of past episode of zoster

Recommended for persons with a risk factor (medical, occupational, lifestyle, or other indication)

No recommendation

Contraindicated

Pneumococcal

Where should PCV13 and PPSV23 vaccines be stored in the pharmacy?

A.Fridge

B.Freezer

C.Shelf (room-temperature)

Pneumococcal

If a patient (over 65 years) needs both PCV13 and PPSV23 (and has never received either before), what is the appropriate dosing interval?

A.PCV13 first, wait 6 months, then PPSV23

B.PPSV23 first, wait 1 year then PCV13

C.PCV13 first, wait 1 year then PPSV23

D.PPSV23 and PCV13 given on the same day

Pneumococcal

Which of the following conditions warrant revaccination after 5 years for PCV13 or PPSV23?

A. Alcoholism
B. Cigarette smoking
C. Solid organ transplantation
D. Diabetes mellitus

Pneumococcal

Identify the brand name:

PCV13

PPSV23

Pneumococcal

How can we screen patients for pneumococcal vaccine?

What techniques are used in your practice to increase vaccination rates?

Vaccine Update: Hepatitis B

Hepatitis B Vaccine

Indications for hepatitis B vaccine

- Patients with diabetes
- Health care professionals
- Patients w/ ESRD or on hemodialysis, chronic liver disease
- Diagnosed or seeking treatment for STIs or MSM
- International Travelers

Hepatitis B Vaccine

Dosing schedule:

- 0, 1, 4-6 months

Products availability:

- Engerix B
- Recombivax HB
- Twinrix (Hep A and Hep B)

Patty Watkins

- How will we schedule Patty's vaccines for hepatitis B?

Patty Watkins

- What are Patty's Tdap needs?
- What follow up would she require?

Patty Watkins

Age: 65 years	Gender: Female
PMH	Type 2 diabetes x 4 years Hypertension x 10 years
Medications	Metformin 850mg twice daily Lantus 15 units SQ QHS Lisinopril 40 mg once daily
Vaccine History	Influenza (IIV3) Oct 2016 Influenza (IIV3) Nov 2015 Influenza (IIV3) Dec 2014 Zoster (Zostavax) 1 dose Dec 2014
Other information	NKDA

Patty Watkins

- What are Patty's zoster needs?
- What follow up would she require?

Shingrix

(Zoster Vaccine Recombinant, Adjuvanted)

Who should get it?

- Shingrix® is recommended for the prevention of herpes zoster and related complications for immunocompetent adults 50 and older, even if they have previously received Zostavax®
- Preferred over Zostavax® for the prevention of herpes zoster and related complications
- This vaccine is not to be used for the treatment of zoster, post-herpetic neuralgia or for prevention of primary varicella
- A 2 dose series of IM injections (0.5 mL each), with the second dose given 2 to 6 months after the first

Shingrix

(Zoster Vaccine Recombinant, Adjuvanted)

What if I was previously vaccinated with Zostavax®? Do I still need Shingrix?

- Shingrix® is recommended for the prevention of herpes zoster and related complications for immunocompetent adults 50 and older, even if they have previously received Zostavax®

Shingrix

(Zoster Vaccine Recombinant, Adjuvanted)

What are the most common side effects?

- The most common side effects seen with the Shingrix® vaccine are pain, redness, or swelling at the injection site. Systemic side effects may include myalgia, fatigue, headache, shivering, or fever. These reactions are transient and usually last from 1 to 3 days.

Shingrix

(Zoster Vaccine Recombinant, Adjuvanted)

How well are people covered after the first dose?

- While numbers of patients who received only one dose were provided in the phase III approval studies, an evaluation on the efficacy was not elucidated
- It was determined that a suboptimal immune response was noted after only one injection of the Shingrix® vaccine

Shingrix

(Zoster Vaccine Recombinant, Adjuvanted)

Update on availability in US Market

Patty Watkins- Recap

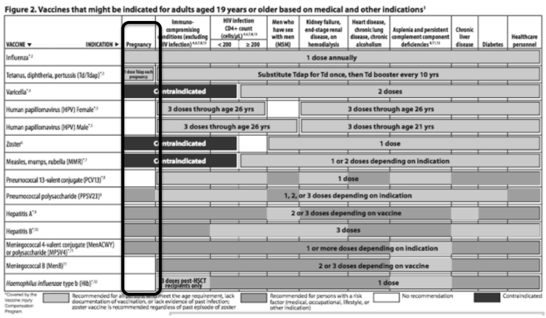
Time	Vaccines
Today	Flu PPSV13 HZV (Shingrix) Hep B 1 Tdap
1 month	Hep B 2
4 months	Hep B 3 HZV (Shingrix)
1 year	PCV23
Yearly	Flu
Every 10 years	Td booster

Sherie Johnson

Age: 33 years	Gender: Female
PMH	Pregnant (28 weeks) Thyroid disorder
Medications	Levothyroxine 100 mcg once daily Prenatal vitamin once daily with dinner Epi-pen prn anaphylaxis
Vaccine History	Influenza (RIV3) Dec 2016 Tdap Jan 2015 Td Feb 2014 Hep B 3 dose series (2010)
Other information	Allergies: Eggs/Milk (hives/rash) Currently pregnant (28 weeks) Previous vaginal childbirth (2.5 years ago) Returning to school to earn her doctorate in nursing.

Sherie Johnson

- How will we determine what vaccines Sherie needs?
- Where can we find this information?



Brand (Manufacturer)	Type	Route of Admin	Approved for ages
Afluria Afluria Quad (Seqirus)	IIV3 IIV4	IM	9+ years 18+ years
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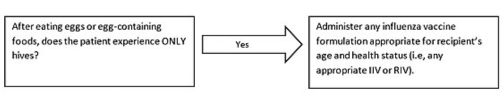
Fluarix Quad (GSK)	IIV4	IM	6+ months (PFS) 3+ years (MDV)
FluBlok FluBlok Quad (Protein Sciences)	RIV3 RIV4	IM	18+ years
Flucelvax Quad (Novartis)	ccIIV4	IM	4+ years
FluLaval FluLaval Quad (ID Biomed Corp)	IIV3 IIV4	IM	3+ years
~~FluMist Quad~~ (MedImmune)	~~LAIV4~~	~~Intranasal~~	~~2-49 years~~
Fluvirin (Seqirus)	IIV3	IM	4+ years
Fluzone Quad Fluzone ID Fluzone HD	IIV4 IIV4 IIV3-HD	IM Intradermal IM	6+ months 18-64 years 65+ years

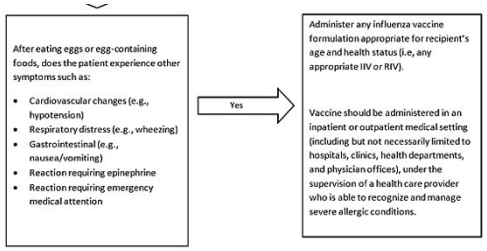
Egg Allergy and Influenza

Recommendations regarding influenza vaccination of persons who report allergy to eggs: Advisory Committee on Immunization Practices, United States, 2016-17 Influenza season.

NOTE: Regardless of a recipient's allergy history, all vaccination providers should be familiar with the office emergency plan and be currently certified in cardiopulmonary resuscitation. Epinephrine and equipment for maintaining an airway should be available for immediate use. (CDC. General recommendations on immunization—recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Recomm Rep 2011;60(No. RR-2)



Egg Allergy and Influenza



Egg Allergy and Influenza

Summary:

CDC and its Advisory Committee on Immunization Practices have updated their guidelines on egg allergy and receipt of influenza (flu) vaccines. Based on the new recommendations, people with egg allergies no longer need to be observed for an allergic reaction for 30 minutes after receiving a flu vaccine. Should it be required, people with a history of severe allergic reaction to egg (i.e., any symptom other than hives) can now be vaccinated in an inpatient or outpatient medical setting (including but not necessarily limited to hospitals, clinics, health departments, and physician offices), under the supervision of any health care provider who is able to recognize and manage severe allergic conditions. Previously, it was recommended that such people be given a flu vaccine only by a doctor with experience in managing severe allergic conditions and that they be observed for 30 minutes after vaccination.

Most flu shots and the nasal spray flu vaccine are manufactured using egg-based technology. Because of this, they contain a small amount of egg proteins, such as ovalbumin. However, studies that have examined the use of both the nasal spray vaccine and flu shots in egg-allergic and non-egg-allergic patients indicate that severe allergic reactions in people with egg allergies are unlikely. A recent CDC study found the rate of anaphylaxis after all vaccines is 1.31 per one million vaccine doses given.

Brand (Manufacturer)	Type	Route of Admin	Approved for ages
Afluria Afluria Quad (Seqirus)	IIV3 IIV4	IM	9+ years 18+ years
Fluad (Seqirus)	aIIV3	IM	65+ years
Fluarix Quad (GSK)	IIV4	IM	6+ months (PFS) 3+ years (MDV)
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Fluvirin (Seqirus)	IIV3	IM	4+ years
Fluzone Quad Fluzone ID Fluzone HD	IIV4 IIV4 IIV3-HD	IM Intradermal IM	6+ months 18-64 years 65+ years

Sherie Johnson

Age: 33 years	Gender: Female
PMH	Pregnant (28 weeks) Thyroid disorder
Medications	Levothyroxine 100 mcg once daily Prenatal vitamin once daily with dinner Epi-pen prn anaphylaxis
Vaccine History	Influenza (RIV3) Dec 2016 Tdap Jan 2015 Td Feb 2014 Hep B 3 dose series (2010)
Other information	Allergies: Eggs/Milk (hives/rash) Currently pregnant (28 weeks) Previous vaginal childbirth (2.5 years ago)

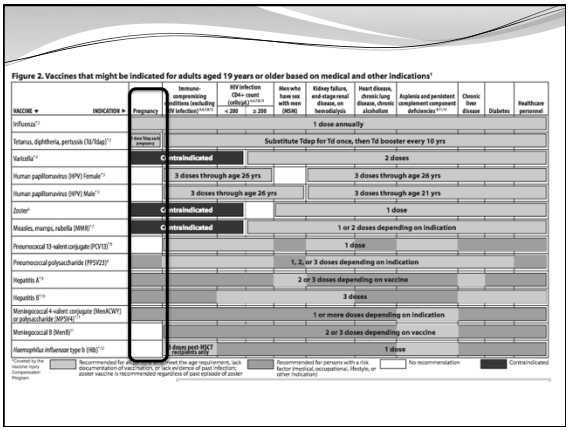


Figure 2. Vaccines that might be indicated for adults aged 19 years or older based on medical and other indications[1]

VACCINE ▼ / INDICATION ►	Pregnancy	Immunocompromising conditions (excluding HIV infection)[4,5,7,8,9]	HIV infection CD4+ count (cells/μL)[4,5,7,8,9] < 200	HIV infection CD4+ count (cells/μL)[4,5,7,8,9] ≥ 200	Men who have sex with men (MSM)	Kidney failure, end-stage renal disease, on hemodialysis	Heart disease, chronic lung disease, chronic alcoholism	Asplenia and persistent complement component deficiencies[8,9,10]	Chronic liver disease	Diabetes	Healthcare personnel
Influenza[2,3]	Give 1dose each pregnancy	1 dose annually									
Tetanus, diphtheria, pertussis (Td/Tdap)[2,3]		Substitute Tdap for Td once, then Td booster every 10 yrs									
Varicella[7,8]	Contraindicated	2 doses									
Human papillomavirus (HPV) Female[7,9]	3 doses through age 26 yrs			3 doses through age 26 yrs							
Human papillomavirus (HPV) Male[7,9]	3 doses through age 26 yrs			3 doses through age 21 yrs							
Zoster[8]	Contraindicated	1 dose									
Measles, mumps, rubella (MMR)[7,9]	Contraindicated	1 or 2 doses depending on indication									
Pneumococcal 13-valent conjugate (PCV13)[7,8]	1 dose										
Pneumococcal polysaccharide (PPSV23)[8]	1, 2, or 3 doses depending on indication										
Hepatitis A[7,8]	2 or 3 doses depending on vaccine										
Hepatitis B[7,10]	3 doses										
Meningococcal 4-valent conjugate (MenACWY) or polysaccharide (MPSV4)[7,8]	1 or more doses depending on indication										
Meningococcal B (MenB)[7]	2 or 3 doses depending on vaccine										
Haemophilus influenzae type b (Hib)[7,10]	3 doses post-HSCT recipients only	1 dose									

[1]Covered by the Vaccine Injury Compensation Program. Recommended for adults who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection; zoster vaccine is recommended regardless of past episode of zoster. Recommended for persons with a risk factor (medical, occupational, lifestyle, or other indication). No recommendation. Contraindicated.

Vaccine Update: Tdap

Tdap Recommendations

- For everyone 11 years and older, including pregnant women
- DTaP is for children 2 months through 6 years of age

CDC recommends that pregnant women receive the Tdap vaccine during the third trimester of each pregnancy.

When should Sherie receive the Tdap?

Tdap Recommendations

- Tdap should be given between 27 and 36 weeks gestation, although it may be given at any time during pregnancy.
- Current available data suggests earlier in the 27-36 week window will maximize antibody transfer to the infant.
- Antibodies are highest 2 weeks after receiving the vaccine.

Tdap Recommendations

- How can we screen patients for needing Tdap vaccination?
- Who else can we target to receive Tdap vaccination?
- How can this be accomplished?

Sherie Johnson - Recap

Time	Vaccines
Today	Flu Tdap
Yearly	Flu

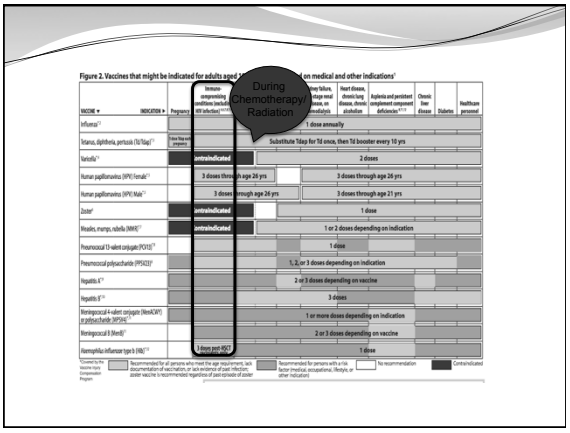
Walt Whitman

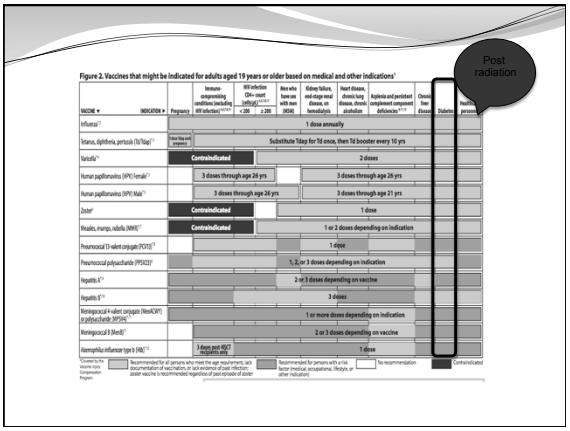
Age: 66 years	Gender: Male
PMH:	COPD Type 2 Diabetes Prostate Cancer (diagnosed 7/1/17)
Medications	Metformin 1000 mg BID Stiolto two inhalations daily Proair PRN Leuprolide 7.5 mg IM monthly
Vaccine History	Full childhood vaccinations Influenza (RIV3), October 2016 No other immunizations as an adult.
Other information	Receiving radiation therapy for prostate CA NKDA

Vaccine Recommendations

Given WW's medical history, which vaccines should he *eventually* receive?

A.Zostavax, PCV13, Hepatitis B, Tdap
B.Zostavax, PPSV23, Hepatitis A/B, Tdap
C.PCV13, Hepatitis B, Td
D.PPSV13, Hepatitis A/B, Td





Vaccine Recommendations

When should WW receive these vaccinations?

A.All should be given now

B.Give inactivated vaccines now, give live vaccines 3 months post radiation

C.Give all vaccines at 3 months post radiation

D.Give inactivated vaccines at 3 months post radiation and live vaccines at 6 months

Vaccine Recommendations

- Zoster
- PCV13
- Hepatitis B
- Tdap
- MMR

Given 3 months after the termination of radiation therapy

Pearls for Immunizing Immunocompromised Patients

- IDSA and ACS both recommend inactivated and live vaccines be administered 3 months following the cessation of chemotherapy/radiation in most cases. If B-cell suppressive therapy was used, both societies recommend waiting 6 months.
- Inactivated vaccines can be administered, but should not be counted in the dose series, because patients may be unable to mount the immune response necessary for adequate antibody production.

Flu Shot for Walt?

What recommendations can you make regarding influenza vaccination?

A. Give Fluad IM 3 months post radiation
B. Give FluMist quad intranasal today
C. Give FluBlock with next administration of radiation
D. Give Afluria Quad in between radiation cycles

Brand (Manufacturer)	Type	Route of Admin	Approved for ages
Afluria Afluria Quad (Seqirus)	IIV3 IIV4	IM	9+ years 18+ years
Fluad (Seqirus)	aIIV3	IM	65+ years
Fluarix Quad (GSK)	IIV4	IM	6+ months (PFS) 3+ years (MDV)
FluBlok FluBlok Quad (Protein Sciences)	RIV3 RIV4	IM	18+ years
Flucelvax Quad (Novartis)	ccIIV4	IM	4+ years
FluLaval FluLaval Quad (ID Biomed Corp)	IIV3 IIV4	IM	3+ years
FluMist Quad (MedImmune)	LAIV4	Intranasal	2-49 years
Fluvirin (Seqirus)	IIV3	IM	4+ years
Fluzone Quad Fluzone ID Fluzone HD (Sanofi Pasteur)	IIV4 IIV4 IIV3-HD	IM Intradermal IM	6+ months 18-64 years 65+ years

Pearls for Immunizing Immunocompromised Patients

- Influenza vaccine may given to cancer patients >6 months of age unless they are:
  - 1. undergoing *intensive* chemotherapy, meaning induction/ consolidation
  - 2. Receiving B-cell antibodies
- Live vaccines should not be administered during radiation/chemotherapy because active and serious infections have occurred secondary to live vaccine use in these patients.

Pearls for Immunizing Immunocompromised Patients

- According to the American Cancer Society, influenza vaccination is best given 2 weeks before chemo/radiation or in-between cycles.
- Hematopoietic stem cell transplant recipients need to wait at least 6 months before receiving influenza vaccine

Resources for Immunizing Immunocompromised Patients

Recommendations vary with the type of immunodeficiency. The following resources should be consulted in providing patient specific care:

- The IDSA 2013 guidelines Vaccination of the Immunocompromised Host. (*CID* 2013; 58; 1-57)
- The American Cancer Society's "Vaccination During Cancer Treatment." (Cancer.org)
- NCCN supportive care guidelines

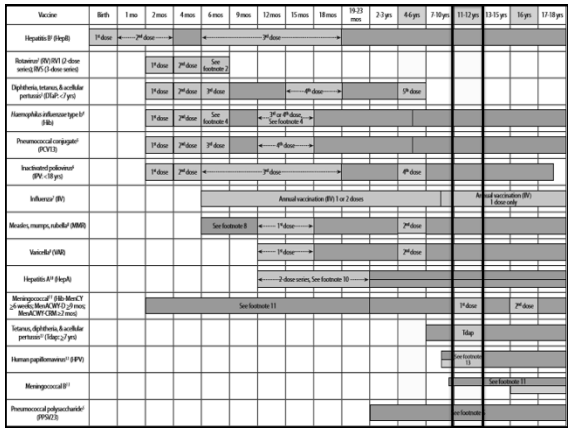
Molly Flanders

Age: 12 years	Gender: Female
PMH:	Chickenpox at age 7
Medications	Daily Flintstone's multivitamin
Vaccine History	Last vaccinations at age 6 Up to date by CDC recommendations at that time
Other information	NKDA

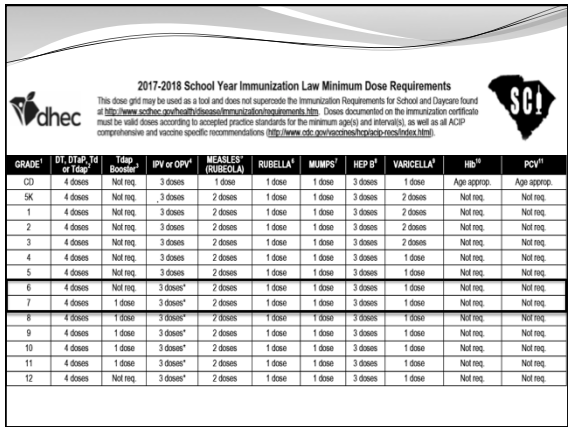
Vaccinations for Molly:

What vaccinations does Molly need before starting school this year. You recommend:

A. Zostavax, PCV13, Tdap booster
B. Meningococcal, HPV, Tdap booster
C. MMR, HPV, Tdap booster
D. Meningococcal, PCV13, Tdap booster



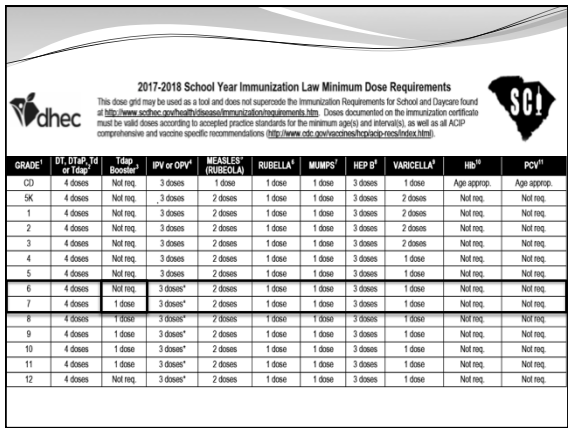
Vaccine	Birth	1 mo	2 mos	4 mos	6 mos	9 mos	12 mos	15 mos	18 mos	19-23 mos	2-3 yrs	4-6 yrs	7-10 yrs	11-12 yrs	13-15 yrs	16 yrs	17-18 yrs
Hepatitis B[1] (HepB)	1st dose	←2nd dose→			←3rd dose→												
Rotavirus[2] (RV) (RV1 (2-dose series); RV5 (3-dose series))			1st dose	2nd dose	See footnote 2												
Diphtheria, tetanus, & acellular pertussis[3] (DTaP: <7 yrs)			1st dose	2nd dose	3rd dose		←4th dose→					5th dose					
Haemophilus influenzae type b[4] (Hib)			1st dose	2nd dose	See footnote 4		←3rd or 4th dose→ See footnote 4										
Pneumococcal conjugate[5] (PCV13)			1st dose	2nd dose	3rd dose		←4th dose→										
Inactivated poliovirus[6] (IPV: <18 yrs)			1st dose	2nd dose	←3rd dose→							4th dose					
Influenza[7] (IV)					Annual vaccination (IV) 1 or 2 doses									Annual vaccination (IV) 1 dose only			
Measles, mumps, rubella[8] (MMR)					See footnote 8		←1st dose→					2nd dose					
Varicella[9] (VAR)							←1st dose→					2nd dose					
Hepatitis A[10] (HepA)							←2-dose series, See footnote 10→										
Meningococcal[11] (Hib-MenCY ≥6 weeks, MenACWY-D ≥9 mos; MenACWY-CRM ≥2 mos)			See footnote 11											1st dose		2nd dose	
Tetanus, diphtheria, & acellular pertussis[12] (Tdap: ≥7 yrs)														Tdap			
Human papillomavirus[13] (HPV)														See footnote 13			
Meningococcal B[11]															See footnote 11		
Pneumococcal polysaccharide[5] (PPSV23)														See footnote 5			



2017-2018 School Year Immunization Law Minimum Dose Requirements

This dose grid may be used as a tool and does not supercede the Immunization Requirements for School and Daycare found at http://www.scdhec.gov/health/disease/Immunization/requirements.htm. Doses documented on the immunization certificate must be valid doses according to accepted practice standards for the minimum age(s) and interval(s), as well as all ACIP comprehensive and vaccine specific recommendations (http://www.cdc.gov/vaccines/hcp/acip-recs/index.html).

GRADE[1]	DT, DTaP, Td or Tdap[3]	Tdap Booster[3]	IPV or OPV[6]	MEASLES[8] (RUBEOLA)	RUBELLA[8]	MUMPS[8]	HEP B[2]	VARICELLA[9]	Hib[10]	PCV[11]
CD	4 doses	Not req.	3 doses	1 dose	1 dose	1 dose	3 doses	1 dose	Age approp.	Age approp.
5K	4 doses	Not req.	3 doses	2 doses	1 dose	1 dose	3 doses	2 doses	Not req.	Not req.
1	4 doses	Not req.	3 doses	2 doses	1 dose	1 dose	3 doses	2 doses	Not req.	Not req.
2	4 doses	Not req.	3 doses	2 doses	1 dose	1 dose	3 doses	2 doses	Not req.	Not req.
3	4 doses	Not req.	3 doses	2 doses	1 dose	1 dose	3 doses	2 doses	Not req.	Not req.
4	4 doses	Not req.	3 doses	2 doses	1 dose	1 dose	3 doses	1 dose	Not req.	Not req.
5	4 doses	Not req.	3 doses	2 doses	1 dose	1 dose	3 doses	1 dose	Not req.	Not req.
6	4 doses	Not req.	3 doses*	2 doses	1 dose	1 dose	3 doses	1 dose	Not req.	Not req.
7	4 doses	1 dose	3 doses*	2 doses	1 dose	1 dose	3 doses	1 dose	Not req.	Not req.
8	4 doses	1 dose	3 doses*	2 doses	1 dose	1 dose	3 doses	1 dose	Not req.	Not req.
9	4 doses	1 dose	3 doses*	2 doses	1 dose	1 dose	3 doses	1 dose	Not req.	Not req.
10	4 doses	1 dose	3 doses*	2 doses	1 dose	1 dose	3 doses	1 dose	Not req.	Not req.
11	4 doses	1 dose	3 doses*	2 doses	1 dose	1 dose	3 doses	1 dose	Not req.	Not req.
12	4 doses	Not req.	3 doses*	2 doses	1 dose	1 dose	3 doses	1 dose	Not req.	Not req.



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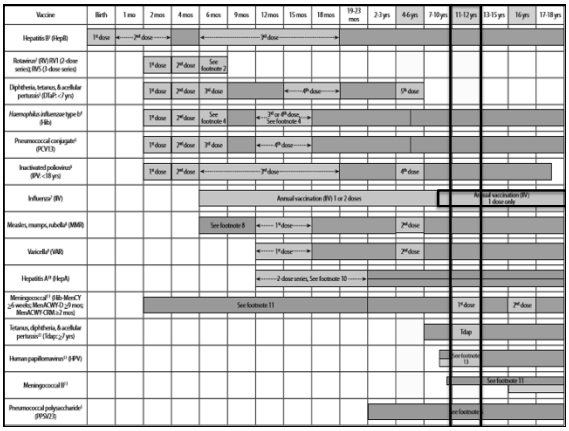
GRADE[1]	DT, DTaP, Td or Tdap[3]	Tdap Booster[3]	IPV or OPV[6]	MEASLES[8] (RUBEOLA)	RUBELLA[8]	MUMPS[8]	HEP B[2]	VARICELLA[9]	Hib[10]	PCV[11]
CD	4 doses	Not req.	3 doses	1 dose	1 dose	1 dose	3 doses	1 dose	Age approp.	Age approp.
5K	4 doses	Not req.	3 doses	2 doses	1 dose	1 dose	3 doses	2 doses	Not req.	Not req.
1	4 doses	Not req.	3 doses	2 doses	1 dose	1 dose	3 doses	2 doses	Not req.	Not req.
2	4 doses	Not req.	3 doses	2 doses	1 dose	1 dose	3 doses	2 doses	Not req.	Not req.
3	4 doses	Not req.	3 doses	2 doses	1 dose	1 dose	3 doses	2 doses	Not req.	Not req.
4	4 doses	Not req.	3 doses	2 doses	1 dose	1 dose	3 doses	1 dose	Not req.	Not req.
5	4 doses	Not req.	3 doses	2 doses	1 dose	1 dose	3 doses	1 dose	Not req.	Not req.
6	4 doses	Not req.	3 doses*	2 doses	1 dose	1 dose	3 doses	1 dose	Not req.	Not req.
7	4 doses	1 dose	3 doses*	2 doses	1 dose	1 dose	3 doses	1 dose	Not req.	Not req.
8	4 doses	1 dose	3 doses*	2 doses	1 dose	1 dose	3 doses	1 dose	Not req.	Not req.
9	4 doses	1 dose	3 doses*	2 doses	1 dose	1 dose	3 doses	1 dose	Not req.	Not req.
10	4 doses	1 dose	3 doses*	2 doses	1 dose	1 dose	3 doses	1 dose	Not req.	Not req.
11	4 doses	1 dose	3 doses*	2 doses	1 dose	1 dose	3 doses	1 dose	Not req.	Not req.
12	4 doses	Not req.	3 doses*	2 doses	1 dose	1 dose	3 doses	1 dose	Not req.	Not req.

Flu shot for Molly

Can Molly get her flu shot today? You recommend:

A. Afluria tri-valent, pursuant to a prescription from PCP
B. FluBlock Quad, pursuant to a prescription from PCP
C. Flucelvax Quad, per state protocol
D. Afluria Quad, per sate protocol

Age: 12 years	Gender: Female
PMH:	Chickenpox at age 7
Medications	Daily Flintstone's multivitamin
Vaccine History	Last vaccinations at age 6 Up to date by CDC recommendations at that time
Other information	NKDA



Brand (Manufacturer)	Type	Route of Admin	Approved for ages
Afluria Afluria Quad (Seqirus)	IIV3 IIV4	IM	9+ years 18+ years
Fluad (Seqirus)	aIIV3	IM	65+ years
Fluarix Quad (GSK)	IIV4	IM	6+ months (PFS) 3+ years (MDV)
FluBlok FluBlok Quad (Protein Sciences)	RIV3 RIV4	IM	18+ years
Flucelvax Quad (Novartis)	ccIIV4	IM	4+ years
FluLaval FluLaval Quad (ID Biomed Corp)	IIV3 IIV4	IM	3+ years
FluMist Quad (MedImmune)	LAIV4	Intranasal	2-49 years
Fluvirin (Seqirus)	IIV3	IM	4+ years
Fluzone Quad Fluzone ID Fluzone HD (Sanofi Pasteur)	IIV4 IIV4 IIV3-HD	IM Intradermal IM	6+ months 18-64 years 65+ years

Brand (Manufacturer)	Type	Route of Admin	Approved for ages
Afluria	IIV3	IM	9+ years
~~Afluria Quad~~ (Seqirus)	~~IIV4~~		~~18+ years~~
Fluad (Seqirus)	aIIV3	IM	65+ years
Fluarix Quad (GSK)	IIV4	IM	6+ months (PFS) 3+ years (MDV)
~~FluBlok~~ FluBlok Quad (Protein Sciences)	~~RIV3~~ RIV4	~~IM~~	~~18+ years~~
Flucelvax Quad (Novartis)	ccIIV4	IM	4+ years
FluLaval FluLaval Quad (ID Biomed Corp)	IIV3 IIV4	IM	3+ years
FluMist Quad (MedImmune)	LAIV4	Intranasal	2-49 years
Fluvirin (Seqirus)	IIV3	IM	4+ years
Fluzone Quad	IIV4	IM	6+ months
~~Fluzone ID~~	~~IIV4~~	~~Intradermal~~	~~18-64 years~~
~~Fluzone HD~~ (Sanofi Pasteur)	~~HIV3-HD~~	~~IM~~	~~65+ years~~

Brand (Manufacturer)	Type	Route of Admin	Approved for ages
Afluria	IIV3	IM	9+ years
[redacted]			
Fluarix Quad (GSK)	IIV4	IM	6+ months (PFS) 3+ years (MDV)
[redacted]			
Flucelvax Quad (Novartis)	ccIIV4	IM	4+ years
FluLaval FluLaval Quad (ID Biomed Corp)	IIV3 IIV4	IM	3+ years
FluMist Quad (MedImmune)	LAIV4	Intranasal	2-49 years
Fluvirin (Seqirus)	IIV3	IM	4+ years
Fluzone Quad	IIV4	IM	6+ months
[redacted]			

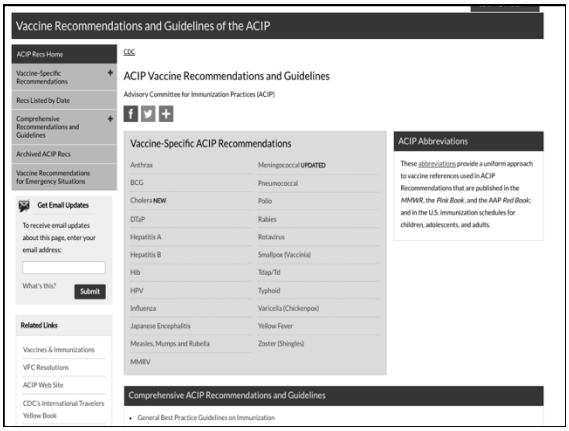
IV. Limitations on Pharmacy-based Vaccination

(a) Age -The administration of the non-influenza vaccines without a written order or prescription pursuant to this Protocol must not be to any persons under the age of eighteen (18) years. The administration of influenza vaccines without a written order or prescription pursuant to this Protocol may not be to any persons under the age of twelve (12) years.

(b) Delegation -A pharmacist may not delegate the administration of vaccines to a pharmacy technician or any other person who is not a pharmacist or pharmacy intern meeting the requirements set forth in III (a), (b) and (c) of this Protocol and any other applicable law and regulation. The qualified pharmacy intern must be under the direct supervision of the pharmacist.

(c) Patient Specific Factors- Potential vaccinees with any contraindications and/or complex medical issues including immunosuppression or history of Guillain-Barré syndrome should be referred to their primary care practitioner.

Staying Up to Date



Immunization Practices: Update 2018

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