

City Health Information

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New York City Department of Health and Mental Hygiene

INFLUENZA PREVENTION AND CONTROL, 2021-2022

- Provider recommendation is the strongest predictor of vaccination. Ensure that you and your entire staff receive flu vaccine and counsel patients and caregivers on the benefits of flu vaccination.
- Use every opportunity to vaccinate all patients aged 6 months and older against influenza, especially those at risk for severe illness from influenza and coronavirus disease 2019 (COVID-19). All routine vaccines can be coadministered with flu vaccine, including COVID-19 vaccine.
- Vaccinate all children aged 6 through 59 months attending City-licensed and City-regulated childcare against influenza by December 31st of each year, as required by the New York City Board of Health.
- Give inactivated flu vaccine to all pregnant persons in any trimester to prevent influenza infection and complications in both the patient and infant.
- Administer high-dose or adjuvanted flu vaccine to patients aged 65 years and older.

INSIDE THIS ISSUE [\(click to access\)](#)

INTRODUCTION

- Important groups to vaccinate against influenza (box)
- Medical conditions that increase risk for severe complications from influenza (box)

VACCINATION COVERAGE AND INEQUITIES

STRONGLY RECOMMEND VACCINATION

- Common questions about the importance of flu vaccination (box)
- What to tell patients about flu vaccine safety (box)
- Immunization and pharmacists (box)

VACCINATE SAFELY DURING COVID-19

ENSURE YOU AND YOUR STAFF ARE VACCINATED

- Vaccination requirements for health care workers (box)

IMPROVE VACCINATION COVERAGE

- National Vaccine Advisory Committee (NVAC) Standards for Adult Immunization Practice (box)

VACCINATE CHILDREN AS EARLY AS POSSIBLE

VACCINATE PREGNANT PEOPLE AGAINST INFLUENZA AND PERTUSSIS

- Reasons to give flu vaccine in any trimester of pregnancy (box)

VACCINATE OLDER ADULTS

TIMING OF FLU VACCINES

THIS SEASON'S VACCINES

- Available flu vaccines for the 2021-2022 season (table)

ASSESS FOR CONTRAINDICATIONS AND PRECAUTIONS

- Administering the flu vaccine to patients with egg allergies (figure)
- Contraindications and precautions for persons with previous severe allergic reaction to flu vaccine (table)

VACCINATE AGAINST PNEUMOCOCCAL DISEASE

- Pneumococcal vaccine administration for adults aged 19 years and older (table)

PRESCRIBE ANTIVIRALS FOR TREATMENT AND PROPHYLAXIS

- High-risk groups who should receive antiviral treatment for influenza (box)

REPORTING, ALERTS, AND SURVEILLANCE

SUMMARY

- Flu vaccine reminders (box)

RESOURCES FOR PROVIDERS

RESOURCES FOR PATIENTS

REFERENCES

CONTINUING MEDICAL EDUCATION ACTIVITY (2 CREDITS)

Influenza is a highly contagious viral infection that results in serious illness, hospitalizations, and deaths every season. Infants, pregnant persons, older adults, and people of any age with chronic medical conditions are at higher risk for serious complications.¹ During the 2020-2021 influenza season, which occurred concurrently with the coronavirus disease 2019 (COVID-19) pandemic, rates of influenza were the lowest recorded.^{2,3} There were no influenza-associated deaths among children in New York City (NYC); 1 child died from influenza in the United States.^{3,4} In addition to flu vaccination, precautions taken during the COVID-19 pandemic, including social distancing and mask wearing, may have limited the spread of influenza.²

Vaccination is our best defense against influenza and its complications. An estimated



7.5 million influenza cases, 105,000 hospitalizations, and 6,300 deaths were prevented by vaccination in the United States during the 2019-2020 influenza season.⁵ The largest proportions of these outcomes were prevented among children aged 6 months to 4 years, who receive flu vaccination at high rates.⁵

Influenza and SARS-CoV-2, the novel coronavirus that causes COVID-19, will continue to co-circulate this season, and relaxed COVID-19 mitigation measures could result in increased influenza activity during the upcoming 2021-2022 flu season.⁶ Flu vaccination will reduce the overall burden of influenza-related illnesses and protect people at risk for severe influenza-related illness. Use every opportunity to administer flu vaccine to all persons aged 6 months and older. Ensure those at greatest risk of severe illness from influenza are vaccinated (**Boxes 1^{1,7}** and **2¹**).⁸

VACCINATION COVERAGE AND INEQUITIES

Despite the importance of flu vaccination, coverage in NYC fell short of the Healthy People

BOX 1. IMPORTANT GROUPS TO VACCINATE AGAINST INFLUENZA^{1,7}

- All children aged 6 through 59 months, especially those aged younger than 2 years
- Adults aged 50 years and older, especially those aged 65 years and older
- People who are or may be pregnant during influenza season
- Residents of nursing homes and other long-term care facilities
- Adults and children with certain high-risk medical conditions (**Box 2**)
- Health care workers
- Household contacts and caregivers of
 - children aged younger than 5 years, especially those younger than 6 months
 - adults aged 50 years and older
 - people with certain medical conditions (**Box 2**)
- Non-Latino Black and non-Latino American Indian or Alaska Native people (risk is due to [social determinants of health](#) and health care access; see [Flu Disparities Among Racial and Ethnic Minority Groups](#))
- People at [increased risk](#) for COVID-19

The New York City Board of Health requires all children aged 6 through 59 months attending City-licensed and City-regulated day care, school-based childcare, Head Start, and prekindergarten programs to receive an annual flu vaccine by December 31st of each year.

2030 target of 70.0% for all age groups during the 2020-2021 season.⁹ Flu vaccination coverage among children aged 17 years and younger was 53.7% overall; it was 66.6% for children aged 6 through 59 months, 54.7% for children aged 5 through 8 years, and 47.2% for children aged 9 through 17 years (unpublished data, Citywide Immunization Registry [CIR]). In the 2019-2020 season, coverage among children aged 6 through 59 months was greater (76.8%) and had increased each season since the NYC Board of Health began requiring flu vaccination for children in City-licensed and City-regulated childcare in 2018 (unpublished data, CIR).¹⁰ Disruption in childcare attendance during the COVID-19 pandemic may have led to lower coverage among children in this age group.

In NYC, non-Latino Black adults receive flu vaccine at lower rates than other groups. In 2020, 50.3% of adults aged 18 years and older reported receiving the flu vaccine; coverage was 43.8% among non-Latino Black adults compared with 50.6%, 51.8%, and 57.2% among non-Latino White, Latino, and Asian adults, respectively (unpublished data, 2020 Community Health Survey). Among adults aged 65 years and older, 69.8% reported that they received the flu vaccine; coverage was 63.0% among non-Latino Black older adults compared with 69.2%, 71.4%, and 84.6% among non-Latino White, Latino, and Asian older adults, respectively (unpublished data, 2020 Community Health Survey).

Health care access and low confidence in vaccines affect vaccination uptake. Reasons for refusing or delaying vaccination are complex and influenced by many factors, some of which

BOX 2. MEDICAL CONDITIONS THAT INCREASE RISK FOR SEVERE COMPLICATIONS FROM INFLUENZA¹

- Asthma and chronic lung disease (eg, chronic obstructive pulmonary disease, cystic fibrosis)
- Heart disease (eg, congenital heart disease, congestive heart failure, coronary artery disease)
- Renal, hepatic, neurologic, hematologic, or metabolic disorders, including diabetes
- Immunocompromise due to any cause, including immunosuppression caused by medications or by HIV infection
- Conditions requiring aspirin- or salicylate-containing medications in people aged younger than 19 years because of risk of Reye syndrome after influenza infection
- Morbid obesity (body mass index ≥ 40)

are outside of a person's control.¹¹ Among Black, Indigenous, and people of color (BIPOC), mistrust in medical research and vaccines is a longstanding concern.¹²⁻¹⁹ Mistrust is based in historical examples of unethical medical research and practices, such as the [Tuskegee syphilis study](#), and is reinforced by ongoing issues with access to and discrimination in health care.^{12,15,19,20}

STRONGLY RECOMMEND VACCINATION

A strong recommendation from a health care provider is one of the greatest predictors of a patient getting vaccinated.^{21,22} Build confidence in the safety and effectiveness of flu and other vaccines with discussion at every visit, especially among patients who are BIPOC (**Resources**).²³

- Listen with empathy, and respectfully address questions or concerns that keep the patient or parent from readily accepting vaccination (**Boxes 3**^{24,25} and **4**^{1,26-28}).
- Share why you, your staff, and your family get vaccinated against influenza each year.
- Ensure that all staff who have contact with patients give the same culturally competent, affirmative, and accurate messages about flu vaccination (**Resources**).
 - As required by law, before vaccinating, give patients the CDC Vaccine Information Statement (VIS), which explains the benefits and risks of a vaccine. VISs are available in more than 30 languages; provide one in a language that the recipient

or parent can understand (see [Immunization Action Coalition](#)).

- Share clear information from trusted sources and be transparent about what you do and do not know.
- Recognize that all people across racial, ethnic, religious, and other groups can experience low vaccine confidence and that the reasons behind their uncertainties are not uniform across any group.
- Understand that perceived unfair treatment by a provider can discourage patient vaccination.¹⁷
- Advise patients that flu vaccination is covered by most insurance plans and is available at no cost under the Affordable Care Act, though there may be a copayment for office visits and restrictions on out-of-network providers.
 - Ensure you have sufficient [Vaccines for Children \(VFC\)](#) vaccine for children who have become newly eligible. In NYC, 74% of children are eligible for the VFC program (unpublished data, 2020 CDC Population Estimate Survey) (**Resources**). More children may become eligible for the VFC program because of insurance loss or economic hardship due to the COVID-19 pandemic.
- If you do not offer vaccinations, refer patients to other vaccine providers, including pharmacies (**Box 5**²⁹).

BOX 3. COMMON QUESTIONS ABOUT THE IMPORTANCE OF FLU VACCINATION^{24,25}

Q: Why do I need a flu vaccine?

A: You need a flu vaccine because influenza can cause severe illness, especially in young children, pregnant people, older adults, and people with certain chronic medical conditions such as asthma, heart disease, and/or diabetes. Influenza can cause complications that lead to hospitalization and/or death, even in otherwise healthy children and adults. Flu vaccination is one way to decrease the risk of you and your family getting sick and needing medical care during the COVID-19 pandemic.

Q: Will a flu vaccine do any good? I got a flu vaccine once and got the flu anyway.

A: Yes, a flu vaccine will give you protection against the influenza virus and prevent many influenza infections, even though it may not be 100% effective. If you do get influenza, the vaccine can make your illness milder and reduce the risk of complications, including hospitalization and death.

Q: How late is too late to get a flu vaccine?

A: You can be vaccinated against influenza at any time during the influenza season. Influenza viruses circulate all year. Influenza activity usually peaks between January and March, but outbreaks have occurred as late as May. If you did not get a flu vaccine at the start of the influenza season, you should still be vaccinated after December and into the new year.

Q: Do I need a flu vaccine every year?

A: Yes, everyone aged 6 months and older needs a flu vaccine every year. Influenza viruses can change each influenza season, so you need a flu vaccine every year. This year's flu vaccine includes 2 new influenza strains.

Q: Why do I need a flu vaccine if other people are vaccinated? Won't that keep me from getting influenza?

A: Your best protection against influenza is getting vaccinated yourself. Influenza is highly contagious. People who do not get vaccinated can get influenza themselves and pass it on to people who may be more likely to have serious complications, including infants younger than 6 months, pregnant people, older adults, and people with chronic health conditions.

VACCINATE SAFELY DURING COVID-19

During the COVID-19 pandemic, follow best practices for safe interactions among staff and patients when administering flu and other vaccines.⁸ See [Interim Guidance for Routine and Influenza Immunization Services During the COVID-19 Pandemic](#) and [Guidance for Planning Vaccination Clinics Held at Satellite, Temporary, or Off-Site Locations](#).

Currently, 3 COVID-19 vaccines are available in the United States under emergency use authorization or full licensure by the FDA. COVID-19 vaccine can be coadministered with other vac-

BOX 4. WHAT TO TELL PATIENTS ABOUT FLU VACCINE SAFETY^{1,26-28}

Vaccines generally cause only mild reactions

- Most side effects are minor and pass quickly; serious side effects are very rare
 - The flu shot can cause soreness, redness, or swelling at the injection site, headache, fatigue, muscle aches, and low-grade fever
 - The nasal spray flu vaccine may cause a localized reaction, such as nasal congestion
- Flu vaccines have a long safety track record and are thoroughly tested by the FDA for purity and potency before they are released for distribution
 - The FDA and Centers for Disease Control and Prevention maintain robust surveillance systems for the detection and identification of any safety issues

The flu vaccine is made from safe ingredients

- Thimerosal is a vaccine preservative made with ethyl mercury. Ethyl mercury is not the same as the type of mercury associated with fish (which is called methylmercury). Ethyl mercury is quickly excreted from the body and does not cause harm
- **No evidence of harm** has been found with the low doses of thimerosal in vaccines; there have been minor reactions such as redness and swelling at the injection site
 - There is no thimerosal in single-dose preparations of flu vaccine; all multidose vials of flu vaccines contain a small amount of thimerosal

The flu vaccine is unlikely to cause a severe allergic reaction

- Many forms of flu vaccine do not contain common allergens such as preservatives, antibiotics, or gelatin; some are egg-free. There is no latex in any of this season's vaccines
- Your allergies will be reviewed to assess whether you are eligible to receive flu vaccine

The flu vaccine cannot cause influenza

- The inactivated flu vaccine does not contain live viruses, so it cannot cause influenza
- The nasal spray flu vaccine does contain live viruses; however, the viruses are weakened so that they cannot cause influenza, but they may cause nasal congestion

cines, including flu vaccine. See [Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Approved or Authorized in the United States](#) and [COVID-19 Vaccine Information for Providers](#) for up-to-date information on COVID-19 vaccines, including eligible and special populations, and contraindications.

ENSURE YOU AND YOUR STAFF ARE VACCINATED

All health care workers should be vaccinated against influenza as soon as vaccine is available to protect themselves, their families, and their patients from influenza infection and transmission (**Box 6**^{30,31}). Flu vaccination among NYC health care workers in regulated facilities increased after New York State (NYS) influenza prevention regulations were established in 2013; in the 2019-2020 season, vaccination coverage was 72.2% (unpublished data, NYS Health Department).

IMPROVE VACCINATION COVERAGE

During the COVID-19 pandemic, there was significant disruption in the administration of routine vaccines. In addition to strongly recommending all due or overdue vaccines, implement best practices, such as using standing orders, reminder-recall systems, self-screening tools, posters, and patient handouts to improve vaccination uptake and reduce inequities (**Resources**). Follow the National Vaccine Advisory Committee (NVAC) Standards for Adult Immunization Practice (**Box 7**^{8,29,32}).

BOX 5. IMMUNIZATION AND PHARMACISTS²⁹

- Pharmacists in New York State are authorized to administer
 - Flu vaccine to everyone aged 2 years and older
 - COVID-19 vaccine to eligible persons
 - Tetanus-containing (Td/Tdap), pneumococcal (PCV13 and PPSV23), meningococcal (MenACWY and MenB), and zoster vaccines to adults aged 18 years and older
- Patients can check with their local pharmacy directly or visit NYC [Vaccine Locator](#) and [HealthMap](#) to search for vaccines available, ages served,⁹ and payment and insurance information
- Pharmacists administering flu vaccine should check the [Citywide Immunization Registry](#) (CIR) to assess for and coadminister any other vaccines that are due
- Pharmacies routinely report flu (and other) vaccinations to the CIR; during the 2020-2021 season, they reported administering more than 750,000 doses of flu vaccine (unpublished data, CIR)

⁹New York State pharmacists may vaccinate children aged as young as 2 years, but each pharmacy may have its own age limits

VACCINATE CHILDREN AS EARLY AS POSSIBLE

Young children are at high risk of serious complications from influenza. It is especially important to protect infants aged younger than 6 months because they are at high risk of influenza-related hospitalizations and medically attended visits, but are too young to be vaccinated. Strongly encourage household contacts and childcare providers to get vaccinated.

The NYC Board of Health requires all children aged 6 through 59 months attending City-licensed and City-regulated childcare to receive an annual flu vaccine by December 31st of each year.¹⁰ During the 2020-2021 season, vaccination coverage for children in this age group was 66.6%, a 10% decrease from the previous season, which may have resulted from disruption in childcare attendance during the COVID-19 pandemic (unpublished data, CIR).

The CDC recommends administering 2 doses of flu vaccine (at least 4 weeks apart) to all children aged 6 months through 8 years if they have not received 2 or more doses of flu vaccine before July 1, 2021. For those doses received before July 1, 2021, the 2 doses of flu vaccine need not have been administered in the same season or in consecutive seasons.¹ All other children should receive 1 dose of flu vaccine.¹ Pharmacists in NYS can administer flu vaccine to children aged as young as 2 years (**Box 5²⁹**).

VACCINATE PREGNANT PEOPLE AGAINST INFLUENZA AND PERTUSSIS

Influenza

Influenza can be dangerous to pregnant people and infants who are too young to receive the vaccine. The flu vaccine protects pregnant people

BOX 6. VACCINATION REQUIREMENTS FOR HEALTH CARE WORKERS^{30,31}

- When the New York State Commissioner of Health declares that influenza is prevalent, Articles 28, 36, and 40 require health care and residential facilities to
 - document the flu vaccination status of all health care workers
 - provide masks for unvaccinated workers and ensure that masks are worn in the presence of patients or residents as long as influenza is prevalent
- Many health care facilities must also report health care workers' vaccination status to the Centers for Medicare and Medicaid Services (CMS) using the National Healthcare Safety Network platform. See [CMS Reporting Requirements](#)

against influenza as well as their newborns in the first few months of life through transplacental transfer of antibodies during pregnancy.³³ The American College of Obstetricians and Gynecologists (ACOG)³⁴ and Advisory Committee for Immunization Practices (ACIP)¹ recommend flu vaccination in pregnancy as the standard of care. In 2018, more than 1 in 7 pregnant people in NYC reported that they did not get a recommendation from their health care provider to receive a flu vaccine during the 12 months before delivery. Only 60.1% of pregnant people reported receiving the flu vaccine that year (unpublished data, Pregnancy Risk Assessment Monitoring System [PRAMS]).

As provider recommendation is the greatest predictor of vaccination,^{21,22} strongly recommend and offer inactivated flu vaccine to all pregnant people in any trimester as soon as vaccine becomes available (**Box 8^{1,33,35-39}**).

BOX 7. NATIONAL VACCINE ADVISORY COMMITTEE (NVAC) STANDARDS FOR ADULT IMMUNIZATION PRACTICE^{8,29,32}

1. **ASSESS** the immunization status of all patients at every visit
2. **STRONGLY RECOMMEND** needed vaccines
3. **ADMINISTER** needed vaccines or **REFER** patients to another vaccinator
 - a. Administer all due or overdue vaccinations according to the [routine immunization schedule](#) during the same visit. All routine vaccines can be coadministered with flu vaccine, including COVID-19 vaccine
 - b. Use nonpatient-specific standing orders to allow registered nurses to independently assess patient vaccination status and administer needed vaccines without a direct order from the physician; this will save time and reduce missed opportunities for vaccination (**Resources**)
 - c. If you do not stock vaccine, use [NYC HealthMap](#) to find a local vaccine provider, such as a pharmacist, for referral (**Box 5**)
4. **DOCUMENT** all vaccines that patients receive
 - a. Use the [Citywide Immunization Registry](#) (CIR) to document vaccinations and to let other providers know which vaccines patients have received
 - b. Report immunizations given to adult patients to the CIR
 - As a condition of receiving federally funded vaccine, providers are mandated to report all COVID-19 vaccinations to the CIR within 24 hours of administration
 - Providers should report all other immunizations administered to persons aged 19 years and older to the CIR, with the patient's written or verbal consent

Pertussis

When offering and administering flu vaccine, providers should also strongly recommend and offer tetanus, diphtheria, and pertussis (Tdap) vaccine to all pregnant people during each pregnancy, preferably during 27 to 36 weeks' gestation. Young infants are at greatest risk of severe disease, hospitalizations, and death from pertussis.⁴⁰ Like the flu vaccine, the Tdap vaccine protects newborns in the first few months of life against pertussis through transplacental transfer of antibodies during pregnancy. A large US study concluded that maternal Tdap vaccination prevented 91.4% of pertussis infections among infants in the first 2 months of life, before the first infant dose of diphtheria, tetanus, and pertussis (DTaP) vaccine is typically administered.⁴¹

In 2018, 68.2% of pregnant people in NYC reported that their provider recommended Tdap vaccine during any prenatal care visit, and 67.4% reported receiving Tdap vaccine (unpublished data, PRAMS). See [ACIP's complete Tdap vaccination recommendations](#) for pregnancy and pertussis.

VACCINATE OLDER ADULTS

For adults aged 65 years and older, the NYC Health Department recommends high-dose or adjuvanted flu vaccines. This season, both the high-dose and adjuvanted flu vaccines are available only as quadrivalent vaccines.¹

However, if you only have standard dose (SD) quadrivalent inactivated vaccine, do not delay vaccinating your patients aged 65 years and older.

TIMING OF FLU VACCINES

Vaccinate children who require 2 doses of flu vaccine with their first dose as soon as vaccine becomes available so the second dose can be given by the end of October.¹ Vaccinate children who require only one dose of vaccine as soon as vaccine is available; there is less evidence that immunity wanes over time among children as compared with adults.¹ Similarly, vaccinate pregnant persons in their third trimester soon after vaccine becomes available, as vaccination of pregnant persons has been shown to reduce their infants' risk of flu during the first months of life.¹ However, for adults who are not pregnant, avoid flu vaccination in July and August unless later vaccination may not be possible, since the vac-

cine may be less effective before the end of the influenza season, especially among older adults.¹

THIS SEASON'S VACCINES

For the 2021-2022 season, all influenza vaccines are only available in quadrivalent formulation.¹

- Inactivated influenza vaccine (IIV4) and live attenuated influenza vaccine (LAIV4), both egg-based, contain A/Victoria/2570/2019(H1N1)pdm09-like virus (updated); A/Cambodia/e0826360/2020(H3N2)-like virus (updated); B/Washington/02/2019(Victoria lineage)-like virus; and B/Phuket/3073/2013(Yamagata lineage)-like virus.
- Cell culture-based inactivated influenza vaccine (ccIIV) and recombinant influenza vaccine (RIV) contain A/Wisconsin/588/2019(H1N1)pdm09-like virus (updated); A/Cambodia/e0826360/2020(H3N2)-like virus (updated); B/Washington/02/2019(Victoria lineage)-like virus; and B/Phuket/3073/2013(Yamagata lineage)-like virus.

In all flu vaccines (IIV4, LAIV4, ccIIV4, RIV4), the A/H1N1 and A/H3N2 strains were updated from last season's formulations to better match circulating strains. Administer any licensed, age-appropriate influenza vaccine.¹ See **Table 1**^{1,42} for information on this season's vaccines.

ASSESS FOR CONTRAINDICATIONS AND PRECAUTIONS

Ask about patients' current health status, including any acute illness and history of reactions to flu vaccine. For people with a history of egg allergy, if flu vaccine **other than quadrivalent ccIIV or RIV** is used, vaccine should be admin-

BOX 8. REASONS TO GIVE FLU VACCINE IN ANY TRIMESTER OF PREGNANCY^{1,33,35-39}

- Pregnant people are 4 times more likely to have an influenza-related hospitalization than nonpregnant people
- Influenza increases the risk of premature labor and delivery
- Vaccination prevents influenza infection in the infant through transplacental antibody transfer, which protects infants aged younger than 6 months who are too young to get vaccinated and at high risk of complications
- Vaccination with inactivated vaccine during pregnancy is safe in any trimester
- Inactivated flu vaccine has been given to millions of pregnant people without harm and is available in single-dose preparation without thimerosal

istered in an inpatient or outpatient medical setting, under the supervision of a health care provider who is able to recognize and manage severe allergic conditions (**Figure**^{1,43}).¹ Alert patients to potential reactions to the vaccine and tell them to report any concerning reactions.

- **Current illness:** A patient with mild illness, such as diarrhea, upper respiratory tract illness, or otitis media, or on current antimicrobial therapy can be safely vaccinated. If illness is moderate to severe, with or without fever, consider the risks and benefits of administering flu vaccine.^{1,26}
- **History of Guillain-Barré Syndrome (GBS):** Explain the risks and benefits of vaccination in patients with a history of GBS within 6 weeks of receipt of a previous flu vaccination. If such patients are also at high risk of severe influenza complications, the benefits may outweigh the risks.^{1,26}
- A previous severe allergic reaction to flu vaccine, such as anaphylaxis, may be a precaution for or contraindication to future receipt of the vaccine.¹ See **Table 2¹** for details.

- Individual flu vaccines are contraindicated for persons who have had a severe allergic reaction to any component of that vaccine.¹

Inform patients that alternate formulations of flu vaccine are available if they have a known allergy to one or more vaccine components, including preservatives, antibiotics, and/or gelatin. None of the 2021-2022 vaccines contain latex. Check the [CDC Vaccine Contents Table](#) or vaccine package inserts to find a formulation without the implicated ingredient.

In addition to the labeled contraindications, ACIP recommends that LAIV should not be administered to the following groups¹:

- children aged 2 through 4 years who have received a diagnosis of asthma or whose parents report (or medical record notes) that the child had wheezing or asthma during the preceding 12 months;
- people who are immunocompromised;
- people with
 - asplenia or sickle cell disease,
 - cochlear implant,
 - active cerebrospinal fluid leak,

TABLE 1. AVAILABLE FLU VACCINES FOR THE 2021-2022 SEASON^{a,1,42}

Type	Trade Name	Manufacturer	Age Indication	Presentation	Thimerosal Content ^b
IIV4	Afluria Pediatric	Seqirus	6-35 mos	0.25-mL prefilled syringe	Preservative-free
	Afluria	Seqirus	≥3 y	0.5-mL prefilled syringe	Preservative-free
			≥6 mos	5.0-mL multidose vial	24.5 mcg/dose
	Fluzone	Sanofi Pasteur	≥6 mos	0.5-mL prefilled syringe	Preservative-free
				0.5-mL single-dose vial	Preservative-free
				5.0-mL multidose vial	25 mcg/dose
FluLaval	GlaxoSmithKline	≥6 mos	0.5-mL prefilled syringe	Preservative-free	
Fluarix	GlaxoSmithKline	≥6 mos	0.5-mL prefilled syringe	Preservative-free	
ccIIV4^c	Flucelvax	Seqirus	≥6 mos	0.5-mL prefilled syringe	Preservative-free
				5.0-mL multidose vial	25 mcg/dose
RIV4^c	Flublok	Sanofi Pasteur	≥18 y	0.5-mL prefilled syringe	Preservative-free
LAIV4	FluMist	AstraZeneca	2-49 y	0.2-mL single-dose prefilled intranasal sprayer	Preservative-free
High-dose IIV4	Fluzone High-Dose	Sanofi Pasteur	≥65 y	0.7-mL prefilled syringe	Preservative-free
Adjuvanted IIV4	Fluad	Seqirus	≥65 y	0.5-mL prefilled syringe	Preservative-free

ccIIV4, cell culture-based inactivated influenza vaccine, quadrivalent; IIV4, inactivated influenza vaccine, quadrivalent; LAIV4, live attenuated influenza vaccine, quadrivalent; RIV4, recombinant influenza vaccine, quadrivalent

^aAll vaccines listed are intramuscular, except LAIV4, which is intranasal; all vaccines listed are latex-free

^bNew York State law prohibits the administration of vaccines containing more than trace amounts of thimerosal to pregnant people and children aged younger than 3 y, unless this vaccine cannot be obtained despite good-faith effort. In these instances, vaccination of children aged less than 3 y and pregnant people is still recommended because the substantial risk of complications or death from influenza in these groups outweighs the unproven risk of vaccination with thimerosal-containing vaccine

^cThese vaccines are egg-free

- close contacts and caregivers of persons with severe immunosuppression who require a protected environment;
- pregnant people;
- persons who have taken influenza antiviral medications within the previous 48 hours to 17 days, depending on the antiviral used.

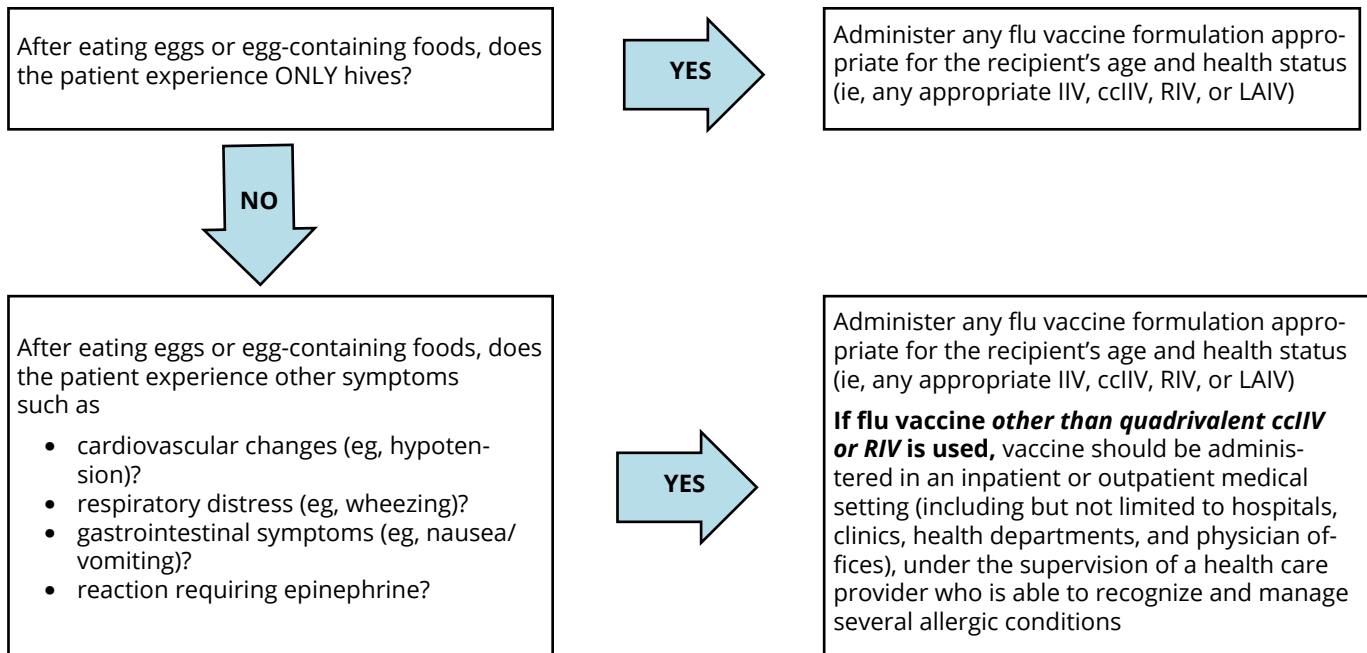
Precautions to LAIV use include asthma in persons aged 5 years and older and presence of certain medical conditions that might predispose to complications after wild-type influenza infection (eg, chronic pulmonary, cardiovascular [except isolated hypertension], renal, hepatic, neurologic, hematologic, or metabolic disorders [including diabetes]).¹

VACCINATE AGAINST PNEUMOCOCCAL DISEASE

Pneumococcal infection is a serious complication of influenza that can lead to severe pneumonia, meningitis, bacteremia, and sinus and ear infections.⁴⁴ Four vaccines are approved to prevent pneumococcal disease: pneumococcal conjugate vaccine (PCV13, PCV15, and PCV20) and pneumococcal polysaccharide vaccine (PPSV23).

Per ACIP recommendations, children aged 59 months and younger should routinely receive the PCV13 series.⁴⁵ Some children with chronic medical conditions may require a single supplemental dose of PCV13 through age 71 months depending

FIGURE. ADMINISTERING THE FLU VACCINE TO PATIENTS WITH EGG ALLERGIES^{1,43}



cclIV, cell culture-based inactivated influenza vaccine; IIV, inactivated influenza vaccine; LAIV, live attenuated influenza vaccine; RIV, recombinant influenza vaccine

NOTE: Regardless of a recipient's egg 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

TABLE 2. CONTRAINDICATIONS AND PRECAUTIONS FOR PERSONS WITH PREVIOUS SEVERE ALLERGIC REACTION TO FLU VACCINE¹

Flu vaccine ^a associated with previous severe allergic reaction (eg, anaphylaxis)	Egg-based IIV4 and LAIV4	cclIV4	RIV4
Any egg-based IIV or LAIV	Contraindication ^b	Precaution ^c	Precaution ^c
Any cclIV	Contraindication ^b	Contraindication ^b	Precaution ^c
Any RIV	Contraindication ^b	Precaution ^c	Contraindication ^b
Unknown	Consult with allergist		

cclIV, cell culture-based inactivated influenza vaccine; IIV, inactivated influenza vaccine; LAIV, live attenuated influenza vaccine; RIV, recombinant influenza vaccine

^aAny valency

^bDo not administer vaccine

^cVaccination should be deferred but may be indicated if the benefit of protection from the vaccine outweighs the risk of an adverse reaction

on their prior vaccination history. People aged 6 through 64 years who do not have a qualifying medical condition are not routinely recommended to receive pneumococcal vaccination. However, many people aged 6 through 64 years do have a qualifying medical condition requiring pneumococcal vaccination. All persons aged 65 years and older are recommended to receive pneumococcal vaccination.

At the ACIP meeting held on October 21, 2021, the adult pneumococcal vaccination recommendations were revised. For adults aged 19 through 64 years with a qualifying medical condition and for all people aged 65 years and older, ACIP recommended administration of either PCV20 alone or PCV15 followed by PPSV23. As of November 8, 2021, the CDC has not published a *Morbidity and Mortality Weekly Report* outlining the new recommendations. Until then, providers should follow the current guidance for use of PCV13 and PPSV23, as summarized in **Table 3**^{46,47}.

The Centers for Medicare and Medicaid Services covers the cost of pneumococcal vaccination, in accordance with current ACIP recommendations, for Medicare patients.

See [Pneumococcal ACIP Vaccine Recommendations and Intervals Between PCV13 and PPSV23 Vaccines: Recommendations of the Advisory Committee on Immunization Practices \(ACIP\)](#) for detailed guidance.

PRESCRIBE ANTIVIRALS FOR TREATMENT AND PROPHYLAXIS

Treatment

Treat people at higher risk of complications (**Box 9**,^{7,48} page 41). Four antiviral medications are approved to treat influenza A and B.⁴⁸⁻⁵⁰

- Oral oseltamivir for patients aged 2 weeks and older: Adverse events include nausea, vomiting, and headache. Off-label use of oseltamivir for treatment of influenza in infants aged younger than 14 days is recommended by the CDC and the American Academy of Pediatrics.
- Inhaled zanamivir for patients aged 7 years and older: Allergic reactions include oropharyngeal or facial edema and skin rash; adverse events include sinusitis, dizziness, and ear, nose, and throat infections. Zanamivir is not recommended for people with underlying respiratory diseases such as

asthma or chronic obstructive pulmonary disease and those with a history of allergy to lactose or milk protein.

- Intravenous peramivir for patients aged 2 years and older: The most common side effect is diarrhea.
- Oral baloxavir for patients aged 12 years and older: The most commonly reported adverse reactions include diarrhea, bronchitis, nasopharyngitis, headache, and nausea, but the incidence of these side effects is not significantly higher than placebo in clinical trials.

Prophylaxis

Use oseltamivir (ages 3 months and older), zanamivir (ages 5 years and older), or baloxavir (ages 12 years and older) for prophylaxis if^{48,51}

- the patient is at high risk of complications after they are exposed to influenza and
- the vaccine is medically contraindicated or was administered within 2 weeks after exposure.

Baloxavir is the first single-dose influenza medicine approved by the FDA for postexposure prophylaxis.⁵¹ If a child is aged younger than 3 months, use of oseltamivir for chemoprophylaxis is not recommended unless the situation is judged critical, because of limited data in this age group.⁴⁸ Prophylaxis with oseltamivir, zanamivir, or baloxavir is generally not recommended if it has been more than 48 hours since initial exposure to influenza.⁴⁸

Peramivir is not recommended for prophylaxis.⁴⁸ See package inserts for complete product safety information. Amantadine and rimantadine are not recommended for treatment or prophylaxis of currently circulating influenza A viruses because of high levels of drug resistance; these agents are ineffective against influenza B viruses.⁴⁸

Influenza antiviral medications may reduce the effectiveness of LAIV if given within the following intervals:¹

- Oseltamivir or zanamivir: 48 hours before to 2 weeks after LAIV
- Peramivir: 5 days before to 2 weeks after LAIV
- Baloxavir: 17 days before to 2 weeks after LAIV

Continued on page 41

TABLE 3. PNEUMOCOCCAL VACCINE ADMINISTRATION FOR ADULTS AGED 19 YEARS AND OLDER^{46,47}

Medical Indication	Underlying Medical Condition	PCV13 ^a for ≥19 y	PPSV23 ^b for 19 through 64 y		PCV13 ^a for ≥65 y	PPSV23 at ≥65 y
		Recommended	Recommended	Revaccination	Recommended	Recommended
None	None of the below	No	No	No	Based on shared clinical decision-making ^c	Yes ^d
Immuno-competent persons	Alcoholism	No	Yes	No	Based on shared clinical decision-making ^c	Yes ^d ≥5 y after any PPSV23 at <65 y
	Chronic heart disease ^e					
	Chronic liver disease					
	Chronic lung disease ^f					
	Cigarette smoking					
	Diabetes mellitus					
	Cochlear implants	Yes	Yes ≥8 wk after PCV13	No	Yes If no previous PCV13 vaccination	Yes ≥8 wk after PCV13, ≥5 y after any PPSV23 at <65 y
Cerebrospinal fluid leaks						
Persons with functional or anatomic asplenia	Congenital or aquired asplenia	Yes	Yes ≥8 wk after PCV13	Yes ≥5 y after first dose of PPSV23	Yes If no previous PCV13 vaccination	Yes ≥8 wk after PCV13, ≥5 y after any PPSV23 at <65 y
	Sickle cell disease/other hemoglobinopathies					
Immuno-compromised persons	Chronic renal failure	Yes	Yes ≥8 wk after PCV13	Yes ≥5 y after first dose of PPSV23	Yes If no previous PCV13 vaccination	Yes ≥8 wk after PCV13, ≥5 y after any PPSV23 at <65 y
	Congenital or acquired immunodeficiencies ^g					
	Generalized malignancy					
	HIV infection					
	Hodgkin disease					
	Iatrogenic immunosuppression ^h					
	Leukemia					
	Lymphoma					
	Multiple myeloma					
	Nephrotic syndrome					
	Solid organ transplant					

PCV13, pneumococcal conjugate vaccine; PPSV23, pneumococcal polysaccharide vaccine

^aIf PPSV23 is administered before PCV13, PCV13 can be given 1 y after PPSV23 for adults aged ≥19 y

^bAdults who received PPSV23 between ages 19 and 64 y need an additional dose of PPSV23 at age ≥65 y and ≥5 y after any prior dose of PPSV23. No additional doses of PPSV23 should be given following the dose administered at age ≥65

^cThe Advisory Committee on Immunization Practices recommends PCV13 for immunocompetent adults aged ≥65 y with [shared clinical decision-making](#)

^dAll adults aged ≥65 y should receive PPSV23. Among immunocompetent adults, if PCV13 has been given, administer PPSV23 at a minimum interval of 1 y after PCV13

^eIncluding congestive heart failure and cardiomyopathies

^fIncluding chronic obstructive pulmonary disease, emphysema, and asthma

^gIncluding B-(humoral) or T-lymphocyte deficiency, complement deficiencies (particularly C1, C2, C3, and C4 deficiencies), and phagocytic disorders (excluding chronic granulomatous disease)

^hDiseases requiring treatment with immunosuppressive drugs, including long-term systemic corticosteroids and radiation therapy

Continued from page 39

REPORTING, ALERTS, AND SURVEILLANCE

Reporting vaccinations

- Report all vaccinations administered to children aged 18 years or younger to the CIR within 2 weeks of administration as mandated by NYS Public Health Law Section 2168. To register with or access the CIR, log on to [NYCMED](#).
- For patients aged 19 years and older, physicians are strongly encouraged to report vaccines administered to the CIR with the patient's verbal or written consent.
- Pharmacists and registered nurses **must** report vaccinations administered to the CIR for patients aged 19 years and older with the patient's verbal or written consent, as per NYS Public Health Law Section 2168.
- Report all COVID-19 vaccinations to the CIR within 24 hours of vaccine administration as a condition of receiving federally funded vaccine.
- The NYC Health Department recommends incorporating CIR consent into a general consent process.

Use your electronic health record (EHR) system to report immunizations to the CIR. Contact mutracking@health.nyc.gov with your facility address, contact information, and current EHR, or call the Provider Access Line (PAL) at 866-692-3641. Providers may be eligible to receive [Meaningful Use or Medicare Access and CHIP Reauthorization Act of 2015 \(MACRA\)](#) incentive payments when using their EHR to report to the CIR. For more information, see [Overview of Meaningful Use and Immunization Reporting](#) and the [Centers for Medicare and Medicaid Services](#).

Reporting influenza cases and deaths

- Report nosocomial cases of even 1 laboratory confirmed case of influenza or clusters of 2 or more cases of influenza-like illness in Article 28 facilities by:
 - calling the NYS Department of Health at 518-474-1142 **or**

Report immunizations to the CIR using your electronic health record (EHR) system. Contact cir@health.nyc.gov with your facility address, contact information, and current EHR, or call 347-396-2400 to learn more.

To receive and administer COVID-19 vaccine, register with CIR and enroll in the [NYC COVID-19 vaccination program](#).

- using the [Health Commerce System Nosocomial Outbreak Reporting Application](#) **or**
- completing a NYS [Healthcare Facility Infection Control \(Nosocomial\) Report](#) and fax it to 518-402-5165.
- Report deaths in children aged younger than 18 years that occurred from a clinically compatible illness in which there is a positive influenza test or from an unknown febrile respiratory illness.
 - Call the PAL at 866-692-3641.

Visit [Reporting Diseases and Conditions](#) for more information.

Updates, alerts, and surveillance

- Register for NYC Health Department influenza alerts through the [Health Alert Network](#) or by calling 866-692-3641.
- Regularly visit the NYC Health Department's [influenza webpage](#) for information about local influenza activity, flu vaccine recommendations, and vaccine supply.
- Consider joining the NYC Health Department's ILINet Influenza Surveillance Program as a sentinel physician. You will receive a weekly e-mail influenza update and guidance on influenza management.

BOX 9. HIGH-RISK GROUPS WHO SHOULD RECEIVE ANTIVIRAL TREATMENT FOR INFLUENZA^{7,48}

- Children aged younger than 2 years
- Adults aged 65 years and older
- People with
 - asthma and chronic lung disease (eg, chronic obstructive pulmonary disease, cystic fibrosis)
 - heart disease (eg, congenital heart disease, congestive heart failure, coronary artery disease)
 - renal, hepatic, neurologic, hematologic, or metabolic disorders, including diabetes
 - immunosuppression, including that caused by medications or by HIV infection
 - morbid obesity (ie, body mass index ≥ 40)
- People who are pregnant or postpartum (within 2 weeks after delivery)
- People aged younger than 19 years receiving long-term aspirin- or salicylate-containing medications, because of the risk of Reye syndrome after influenza infection
- American Indian or Alaska Native people (risk is due to [social determinants of health](#) and health care access; see [Flu Disparities Among Racial and Ethnic Minority Groups](#))
- Residents of nursing homes and other chronic care facilities

Contact Alice Yeung at 347-396-2608 or e-mail ayeung@health.nyc.gov for information.

SUMMARY

Hospitalizations and deaths occur every influenza season. The influenza and SARS-CoV-2 viruses are again circulating at the same time. Use every opportunity to administer flu vaccines

to all eligible persons aged 6 months and older to reduce the burden of respiratory illnesses in the community and protect vulnerable populations at risk for severe illness. Follow safe vaccinating practices and use evidence-based strategies, such as standing orders and reminder-recall systems, to improve flu vaccination rates and eliminate inequities (**Box 10**^{52,53}).

BOX 10. FLU VACCINE REMINDERS^{52,53}

1. **Order enough vaccine**, including enough preservative-free vaccine for pregnant persons and children aged younger than 3 years, as required by New York State public health law. See [Influenza Vaccine Availability Tracking System — IVATS](#) for information
 - a. If you are enrolled in the [Vaccines for Children Program](#), order flu vaccine now if you have not already done so at the [Citywide Immunization Registry \(CIR\)](#). See [Dear Colleague letter](#) for details
2. **Ensure you have sufficient medical supplies**, including syringes, needles, and epinephrine pens, to vaccinate and administer anaphylaxis treatment
3. **Store vaccines safely** to ensure full potency. See [Checklist for Safe Vaccine Storage and Handling](#)
4. **Use your electronic health record (EHR) system** or CIR to identify and contact patients who need vaccination and to monitor vaccination coverage in your practice
5. **Document vaccines** administered and other required information in the patient's record. Provide a [Vaccine Information Statement \(VIS\)](#) in the appropriate language, record the date the VIS was given, and the edition date of the VIS (**Resources**)
6. **Report all immunizations administered to all patients using the CIR**
 - a. Pediatric care practices should report all administered flu vaccine doses to the CIR. Providers administering flu vaccine to adults should report all doses with patient verbal or written consent. You can access up-to-date influenza reports any time during influenza season. Contact cir@health.nyc.gov with your facility address, contact information, and current EHR, or call 347-396-2400
 - b. To inform vaccination quality improvement initiatives, facilities can also use the CIR to generate practice-level vaccine coverage reports, identify unvaccinated patients, and access the CIR texting function for reminder and recall messages
7. **Report adverse reactions to the federal Vaccine Adverse Event Reporting System (VAERS)**, 800-822-7967

See **Resources for Providers** for tips on increasing the vaccination rate in your practice

RESOURCES FOR PROVIDERS

New York City (NYC) Health Department

- Provider Access Line: 866-NYC-DOH1 (866-692-3641)
- Immunization information for providers: <https://www1.nyc.gov/site/doh/providers/health-topics/immunization-information-for-healthcare-providers.page>
See section on Influenza and Pneumococcal Information
- Letter to Providers: Distribution of flu vaccine for the 2021-2022 season has begun: <https://www1.nyc.gov/assets/doh/downloads/pdf/flu/dear-colleague-2021-seasonal-flu-kick-off-letter.pdf>
- Weekly Influenza Surveillance Summary: <https://www1.nyc.gov/site/doh/providers/health-topics/flu-alerts.page>
- Citywide Immunization Registry: <https://www1.nyc.gov/site/doh/providers/reporting-and-services/citywide-immunization-registry-cir.page>
- NYCMED: <https://a816-healthpsi.nyc.gov/NYCMED/Account/Login>
- Health Alert Network (HAN): sign up at <https://a816-healthpsi.nyc.gov/NYCMED/Account/HANSubscribe> or 866-692-3641
- E-mail questions to: nycflu@health.nyc.gov

Improving vaccination coverage

- NYC Health Department
 - NYC Vaccines for Children Program provider requirements. Enrollment and re-certification: <https://www1.nyc.gov/site/doh/providers/nyc-med-cir/vaccines-for-children-requirements.page>
 - Adult immunization action kit: <https://www1.nyc.gov/site/doh/providers/resources/public-health-action-kits-adult-immunization.page>
 - Influenza coverage and text messaging recall guide: <https://www1.nyc.gov/assets/doh/downloads/pdf/cir/cir-flu-coverage-and-custom-recall-texting-guide.pdf>
- Centers for Disease Control and Prevention (CDC)
 - Use of reminder and recall by vaccination providers: <https://www.cdc.gov/mmwr/preview/mmwrhtml/00054628.htm>
 - Influenza print materials: <https://www.cdc.gov/flu/resource-center/freeresources/print/index.htm>
Downloadable posters and patient handouts by audience in different sizes, formats, and languages
 - Use of standing orders programs to increase adult vaccination rates: <https://www.cdc.gov/mmwr/preview/mmwrhtml/rr4901a2.htm>

RESOURCES FOR PROVIDERS *(continued)*

- New York State (NYS) Office of the Professions. Nonpatient-specific standing order and protocol guidelines: <http://www.op.nysed.gov/prof/nurse/immuguide.htm>
- Immunization Action Coalition. Standing orders templates for administering vaccines: <http://www.immunize.org/standing-orders>
- Centers for Medicare and Medicaid Services: Influenza vaccination strategies: <https://innovation.cms.gov/files/x/pgp-flu-vaccination.pdf>

Cultural competence

- World Health Organization. Conversations to build trust in vaccination: a training module for health workers: <https://www.comminit.com/global/content/conversations-build-trust-vaccination-training-module-health-workers>
- US Department of Health and Human Services. Think cultural health: <https://cccm.thinkculturalhealth.hhs.gov>
Free online educational program accredited for physicians, physician assistants, and nurse practitioners (registration required)
- EthnoMed: <https://ethnomed.org>
Community cultural profiles and subjects related to ethnic groups; patient education materials in various languages
- CDC
 - Social determinants of health: <https://www.cdc.gov/socialdeterminants/index.htm>
 - Flu disparities among racial and ethnic minority groups: <https://www.cdc.gov/flu/highrisk/disparities-racial-ethnic-minority-groups.html>

Coronavirus disease 2019 (COVID-19)

- NYC Health Department. COVID-19 vaccine information for providers: <https://www1.nyc.gov/site/doh/covid/covid-19-providers-vaccines.page>
- CDC
 - Information on COVID-19 for health care workers: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/index.html>
 - Interim guidance for routine and influenza immunization services during the COVID-19 pandemic: <https://www.cdc.gov/vaccines/pandemic-guidance/index.html>
 - Interim clinical considerations for use of COVID-19 vaccines currently approved or authorized in the United States: <https://www.cdc.gov/vaccines/covid-19/clinical-considerations/covid-19-vaccines-us.html>
 - Guidance for planning vaccination clinics held at satellite, temporary, or off-site locations: <https://www.cdc.gov/vaccines/hcp/admin/mass-clinic-activities/index.html>
 - Health equity considerations and racial and ethnic minority groups: <https://www.cdc.gov/coronavirus/2019-ncov/community/health-equity/race-ethnicity.html>
 - COVID-19: People with certain medical conditions: <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-with-medical-conditions.html>

Immunization recommendations

- CDC
 - Seasonal influenza (flu). Information for health professionals: www.cdc.gov/flu/professionals
 - Vaccine administration: <https://www.cdc.gov/vaccines/hcp/admin/admin-protocols.html>
- Advisory Committee for Immunization Practices
 - Immunization schedules: www.cdc.gov/vaccines/schedules
 - Pneumococcal vaccine recommendations: www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/pneumo.html
 - Intervals between PCV13 and PPSV23 vaccines: <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6434a4.htm>
 - Shared clinical decision-making recommendations: <https://www.cdc.gov/vaccines/acip/acip-scdm-faqs.html>
 - DTaP/Tdap/Td vaccination recommendations: <https://www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/dtap.html>
- National Foundation for Infectious Diseases. Webinar slides: Shared clinical decision-making for immunization recommendations: <https://www.nfid.org/wp-content/uploads/2020/02/NFID-Webinar-SCDM-For-Immunization-Recommendations-FINAL.pdf>
- NYS Department of Health regulation for health care workers: http://www.health.ny.gov/diseases/communicable/influenza/seasonal/providers/prevention_of_influenza_transmission
- Immunization Action Coalition
 - Influenza vaccine: <http://www.immunize.org/influenza>
 - Checklist for safe vaccine storage and handling: <https://www.immunize.org/catg.d/p3035.pdf>
- American College of Physicians. Adult immunization: <https://www.acponline.org/clinical-information/clinical-resources-products/adult-immunization>
- American College of Obstetricians and Gynecologists. Immunization for women: <http://www.immunizationforwomen.org>

Reporting and documentation

- NYC DOHMH
 - Overview of meaningful use and immunization reporting: <https://www1.nyc.gov/site/doh/providers/reporting-and-services/cir-ehr-meaningfuluse.page>
 - Reporting diseases and conditions: <https://www1.nyc.gov/site/doh/providers/reporting-and-services/notifiable-diseases-and-conditions-reporting-central.page>
- NYS Department of Health
 - Bureau of Communicable Disease Control: 518-473-4439
 - Health Commerce System Nosocomial Outbreak Reporting Application: <https://apps.health.ny.gov/pub/top.html>

RESOURCES FOR PROVIDERS *(continued)*

- Health Care Facility Infection Control (Nosocomial) Report Form DOH 4018: <http://www.health.state.ny.us/forms/doh-4018.pdf>
- Centers for Medicare and Medicaid Services
 - Health care-associated infection reporting requirements: <https://www.cdc.gov/nhsn/pdfs/cms/cms-reporting-requirements.pdf>
 - Medicare Access and CHIP Reauthorization Act of 2015 (MACRA): <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/MACRA-MIPS-and-APMs/MACRA-MIPS-and-APMs>
- National Adult and Influenza Immunization Summit. Influenza Vaccine Availability Tracking System (IVATS): <https://www.izsummitpartners.org/ivats>
- Vaccine Adverse Event Reporting System (VAERS): <https://vaers.hhs.gov>

Vaccine safety

- CDC
 - Vaccine Information Statements: <http://www.cdc.gov/vaccines/hcp/vis/index.html>

- Vaccine excipient summary: <https://www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/b/excipient-table-2.pdf>
- Thimerosal and vaccines: <https://www.cdc.gov/vaccinesafety/concerns/thimerosal/index.html>

Coding and billing information

- Immunization Action Coalition. Vaccinating adults. A step-by-step guide: <https://www.immunize.org/guide>
See Step 7B: How to Bill for Adult Immunizations
- Centers for Medicare and Medicaid Services
 - Medicare part B immunization billing: seasonal influenza virus, pneumococcal, and hepatitis B: https://www.cms.gov/outreach-and-education/medicare-learning-network-mln/mlnproducts/downloads/qr_immun_bill.pdf
 - Medicare part D vaccines: <https://www.cms.gov/outreach-and-education/medicare-learning-network-mln/mlnproducts/downloads/vaccines-part-d-factsheet-icn908764.pdf>

City Health Information archives: <https://www1.nyc.gov/site/doh/providers/resources/city-health-information-chi.page>

RESOURCES FOR PATIENTS**General information**

- National Foundation for Infectious Diseases. Influenza and adults: <https://www.nfid.org/infectious-diseases/influenza-and-adults>

Educational materials

- New York City (NYC) Health Department
 - Seasonal flu (influenza): <http://www.nyc.gov/flu>
Publications, brochures, and posters
 - Adult immunization action kit: <https://www1.nyc.gov/site/doh/providers/resources/public-health-action-kits-adult-immunization.page>
 - Vaccinations and pregnancy: <https://www1.nyc.gov/site/doh/health/publications/health-bulletin/health-bulletin-119.page>
- Immunization Action Coalition. Vaccine Information Statements (VIS): <http://www.immunize.org/vis>
Available in many languages
- CDC
 - Communication resource center: <https://www.cdc.gov/flu/resource-center/index.htm>
Flyers, posters, and brochures for the general public, families, children, and high-risk groups

- Thimerosal and vaccines: <https://www.cdc.gov/vaccinesafety/concerns/thimerosal/index.html>

Vaccination locations

- NYC COVID-19 and Flu Vaccine Finder: <https://vaccinefinder.nyc.gov>
- NYC Health Department. Immunization clinics: <http://www1.nyc.gov/site/doh/services/immunization-clinics.page>
- NYC Health + Hospitals health care centers: https://www.nychealthandhospitals.org/health_care
- NYC HealthMap: <https://a816-healthpsi.nyc.gov/nychealthmap>
Searchable map of health services
- US Department of Health and Human Services. Find a health center: <https://findahealthcenter.hrsa.gov>

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Participating faculty members and planners have no relevant financial relationships to disclose:

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