

**OREGON HEALTH AUTHORITY
IMMUNIZATION PROGRAM
INACTIVATED, AND RECOMBINANT, INFLUENZA VACCINES (IIV, RIV)
Issued September 9, 2016**

- All influenza vaccines for use in the 2016-2017 influenza season (Northern Hemisphere winter) contain the following:
 - A/California/7/2009 (H1N1)pdm09-like virus;
 - A/Hong Kong/4801/2014 (H3N2)-like virus;
 - B/Brisbane/60/2008-like virus (B/Victoria lineage).
- Quadrivalent vaccines contain an additional influenza B strain, B/Phuket/3073/2013-like virus (B/Yamagata lineage).
- These are the same vaccine viruses that were chosen for inclusion in 2016 Southern Hemisphere seasonal flu vaccines.

Based on published recommendations from the Advisory Committee on Immunization Practices: ¹

- Providers should offer flu vaccination to unvaccinated persons by the end of October, if possible. Vaccination should continue to be offered as long as influenza viruses are circulating and unexpired vaccine is available.¹
- Children aged 6 months through 8 years who require 2 doses should receive their first dose as soon as possible after vaccine becomes available, and the second dose \geq 4 weeks later.
- Children \leq 8 years who have received 2 or more doses previously only need one dose this year. The two doses need not have been received during the same season or consecutive seasons. See figure 1 on page 6.
- **Use of LAIV is not recommended. IIV is preferred for all ages.**¹
- ACIP no longer recommends that egg-allergic recipients be observed for 30 minutes postvaccination for signs and symptoms of an allergic reaction.
- Flud[®] IIV₃ may be given to individuals \geq 65 years of age.¹¹
- Flublok[®] RIV₄ may be given to individuals \geq 18 years of age.¹⁰
- Flucelvax[®] cclIV₄ may be given to individuals \geq 4 years of age.⁹

Note: Vaccination with IIV is strongly recommended for all pregnant women at any stage of pregnancy.¹

Revised: 09-2016

I. OREGON IMMUNIZATION MODEL STANDING ORDER:

1. Best Practice (but not required for influenza vaccine only): Check the ALERT Immunization Information System (IIS) to determine whether the patient needs this vaccine and any other vaccines.
2. Screen clients for contraindications.
3. Provide a current Vaccine Information Statement (VIS) and answer any questions.
4. Record all required data elements in the client's permanent health record.
5. Give the dosage of influenza vaccine recommended for the recipient's age intramuscularly (IM) or intradermally (ID) depending on the formulation. See pages 5-6.
6. May be given with all ACIP-recommended child and adult vaccinations.
7. Ask client to remain seated on the premises for 15 minutes after vaccination to decrease the risk of injury should they faint.

Signature

Health Officer or Medical Provider

Date

Signature

Health Officer or Medical Provider

Date

This order expires on June 30, 2017.

II. U.S. LICENSED INACTIVATED INFLUENZA 2016–2017²⁻¹¹

| Product Name | Age Indications | Presentation | Mercury, from thimerosal ($\mu\text{g Hg}/0.5 \text{ mL}$) | Ovalbumin content ($\mu\text{g}/0.5\text{mL}$) |
|---|------------------------|---|--|--|
| IIV ₄ Fluzone ^{®4} (Sanofi Pasteur) | ≥6 months | 5.0 mL multidose vial | 25 $\mu\text{g Hg}/0.5 \text{ mL}$ | ≤0.04 \diamond |
| IIV ₄ Fluzone ^{®4} (Sanofi Pasteur) | 6–35 months | 0.25 mL prefilled syringe | No | ≤0.04 \diamond |
| IIV ₄ Fluzone ^{®4} (Sanofi Pasteur) | ≥36 months | 0.5 mL single-dose prefilled syringe | No | ≤0.04 \diamond |
| | | 0.5 mL single-dose vial | No | ≤0.04 \diamond |
| IIV ₄ Fluarix ^{®5} (GSK) | ≥3 years | 0.5mL single-dose prefilled syringe | No | ≤0.05 |
| IIV ₄ FluLaval ^{®6} (ID Biomedical distributed by GSK) | ≥3 years | 0.5 mL single-dose prefilled syringe | No | ≤0.3 |
| | | 5.0 mL multidose vial | ≤25 $\mu\text{g Hg}/0.5 \text{ mL}$ | ≤0.3 |
| IIV ₃ Fluvirin ^{®7} (Seqirus) | ≥4 years | 0.5 mL single-dose prefilled syringe (Syringe tip cap may contain latex) | ≤1 $\mu\text{g Hg}/0.5 \text{ mL}$ | ≤1 |
| | | 5.0 mL multidose vial | 25 $\mu\text{g Hg}/0.5 \text{ mL}$ | ≤1 |

Notes below:

II. U.S. LICENSED INACTIVATED INFLUENZA VACINES 2016–2017¹ Cont.

| Product Name | Age Indications | Presentation | Mercury, from thimerosal ($\mu\text{g Hg}/0.5 \text{ mL}$) | Ovalbumin content ($\mu\text{g}/0.5\text{mL}$) |
|--|--------------------------------------|---|--|--|
| IIV ₃ Afluria ^{®8} (Seqirus) | $\geq 9^*$ years | 0.5 mL single- dose prefilled syringe | No | <1 |
| | | 5.0 mL multidose vial | 24.5 $\mu\text{g Hg}/0.5 \text{ mL}$ | <1 |
| | 18–64 years | Stratis [®] jet injector | | |
| cIIIV ₄ Flucelvax ^{®9§} (Seqirus) | ≥ 4 years | 0.5mL single-dose prefilled syringe (Syringe tip cap may contain latex) | No | See Below [§] |
| RIV ₃ Flublok ^{®10‡} (Protein Sciences) | ≥ 18 | 0.5mL single-dose vial | No | No |
| IIV ₄ Fluzone ^{®3} Intradermal (Sanofi Pasteur) | 18–64 years See Appendix A | Prefilled 0.1-mL microinjection system | No | ≤ 0.02 per 0.1 mL dose \diamond |
| IIV ₃ Fluzone ^{®2} High dose (Sanofi Pasteur) | ≥ 65 years | 0.5 mL pre-filled syringe (gray plunger rod) | No | ≤ 0.1 \diamond |
| IIV ₃ adjuvanted Fluad ^{®11} (Novartis) | ≥ 65 years | 0.5 mL single- dose prefilled syringe | No | <0.4 |

Notes for Section II page 3-4.

*ACIP recommends that Afluria[®] be reserved for patients ≥ 9 years of age, because it has been associated with febrile seizures in younger children. However, if no other age-appropriate IIV is available, Afluria[®] may be given to children ≥ 5 years of age with medical conditions that increase their risk for influenza complications; providers should discuss the vaccine's benefits and the risk of febrile seizures with parents or caregivers before administration to any child < 9 years of age.¹ Afluria[®] is the only FDA approved influenza vaccine for use with the PharmaJet Needle-Free Injector: restricted to delivery in individuals 18–64 years.⁸

◇ Information provided by Sanofi Pasteur Medical Affairs (1–800–822–2463 or MIS.Emails@sanofipasteur.com).

§Flucelvax[®] is estimated to contain < 50 femtograms ($< 5 \times 10^{-8}$ μg) of total egg protein (of which ovalbumin is a fraction) per 0.5-mL dose.⁹

‡Flublok[®] prepared from the continuous insect cell line derived from Sf9 cells of the fall armyworm and grown in a serum-free medium composed of chemically-defined lipids, vitamins, amino acids and mineral salts.¹⁰

III. RECOMMENDATIONS FOR USE: ¹

PERSONS FOR WHOM ANNUAL VACCINATION IS RECOMMENDED

- All persons ≥ 6 months of age without contraindications should be vaccinated annually.
- Pregnant women during any trimester

IV. VACCINE SCHEDULE: ¹

| Inactivated Influenza Vaccine (IIV) and Recombinant Influenza Vaccine (RIV) Schedule for the 2016–2017 Flu Season* | | | |
|--|---------|--------------|----------------------------|
| Age Group | Dose | No. of Doses | Route |
| 6–35 months | 0.25 mL | 1 or 2* | Intramuscular [◇] |
| 3–8 years | 0.5 mL | 1 or 2* | Intramuscular [◇] |
| ≥ 9 years | 0.5 mL | 1 | Intramuscular [◇] |
| Optional Formulations With Age Restrictions | | | |

| | | | |
|-------------|--------|---|------------------------------|
| 18–64 years | 0.1 mL | 1 | Intradermal [§] |
| ≥65 years** | 0.5 mL | 1 | Intramuscularly [◇] |

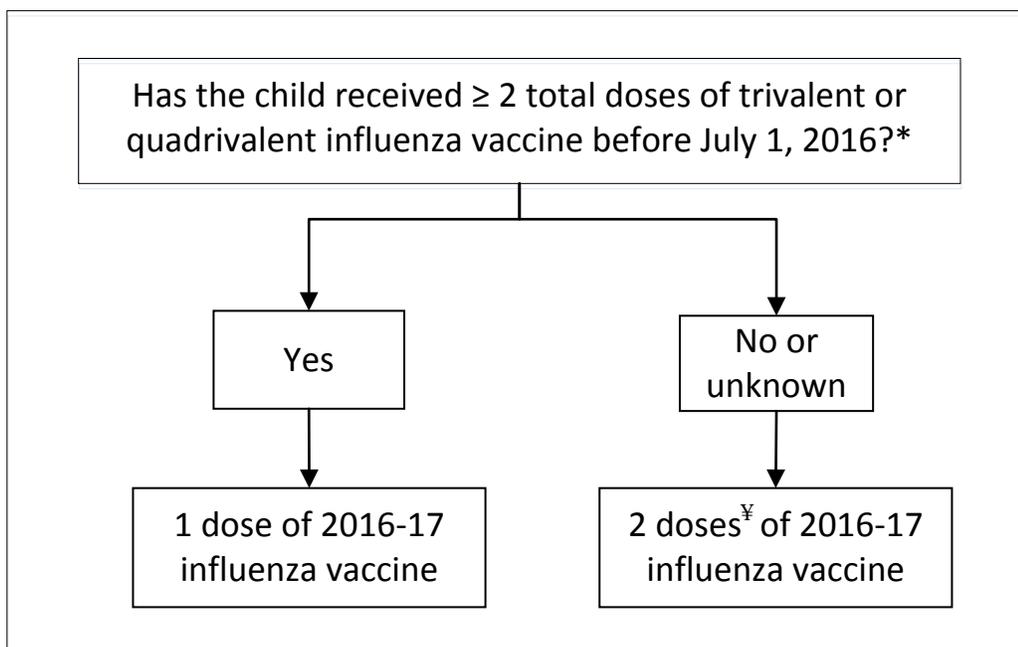
*See figure 1 below for algorithm on the number of doses recommended.¹

◇Recommended site of intramuscular injection is the deltoid for adults and older children and the anterolateral aspect of the thigh for infants through 36 months of age.¹²

§Fluzone's[®] intradermal formulation is a prefilled microinjection system which needs to be administered perpendicular to the skin, in the region of the deltoid. (See Appendix A).³

**Fluzone[®] High Dose² and Flud^{®11}.

Figure 1. Influenza vaccine dosing algorithm for children aged 6 months through 8 years — Advisory Committee on Immunization Practices, United States, 2016–17 influenza season.¹



*The two doses need not have been received during the same season or consecutive seasons.

‡ Doses should be administered ≥4 weeks apart.

V. INTERVAL CONSIDERATIONS

1. Providers should offer vaccination to unvaccinated persons aged ≥6 months during routine health care visits and hospitalizations when vaccine is available.¹

2. Adults have antibody protection against influenza virus about 2 weeks after vaccination.¹³

VI. CONTRAINDICATIONS*

NOTE – Persons with a history of egg allergy **may receive** any licensed and recommended influenza vaccine that is appropriate for their age and health status. Vaccine administration should be supervised by a health care provider who is able to identify and manage severe allergic reactions.¹

A severe allergic reaction to a previous dose of influenza vaccine is a contraindication to additional doses, regardless of the component suspected of being responsible for the reaction.¹

| Vaccine | Allergen(s) |
|-------------------------|--|
| Fluzone ^{®2-4} | Egg protein, formaldehyde |
| FluLaval ^{®6} | Egg protein, formaldehyde, polysorbate 80. |
| Fluarix ^{®5} | Egg protein, hydrocortisone, gentamicin sulfate, polysorbate 80, formaldehyde |
| Fluvirin ^{®7} | Egg protein, polymyxin, neomycin, beta-propiolactone. Tip caps of prefilled syringes may contain latex. |
| Afluria ^{®8} | Egg protein, neomycin, polymyxin B and beta–propiolactone. |
| Flucelvax ^{®9} | Egg protein, Madin–Darby Canine Kidney (MDCK) cell protein, polysorbate 80, cetyltrimethylammonium bromide (CTAB) and beta–propiolactone. |
| Flublok ^{®10} | Polysorbate 20 (Tween ^{®20}), baculovirus and <i>Spodoptera frugiperda</i> cell proteins, baculovirus and cellular DNA, and Triton X–100. |
| Fluad ^{®11} | Egg protein, MF59C.1, [§] neomycin, kanamycin, barium, formaldehyde, cetyltrimethylammonium bromide (CTAB). The tip caps of prefilled syringes contain natural rubber latex. |

*Persons who have experienced a severe allergic reaction requiring epinephrine or emergency medical attention with any previous dose of influenza vaccine.

[§]Mf59C.1 adjuvant (9.75mg squalene, 1.175 mg of polysorbate 80, 1.175mg sorbitan trioleate, 0.66mg sodium citrate dehydrate, 0.04mg citric acid monohydrate at pH 6.9–7.7)

VII. PRECAUTIONS¹

1. Persons with moderate or severe illnesses with or without fever should delay immunization until illness has resolved. However, minor illnesses, e.g., mild upper

respiratory infection (URI) or allergic rhinitis, with or without fever do not contraindicate use of influenza vaccine.

2. Persons with a history of Guillain-Barré Syndrome (GBS) following influenza vaccination have a substantially greater likelihood of subsequently developing GBS than persons without such a history. Whether influenza vaccination might be causally associated with this risk for recurrence is not known. Consult with an individual's health care provider and consider avoiding a subsequent influenza vaccination in persons known to have developed GBS within **6 weeks** of a previous influenza vaccination. Experts believe that the benefits of influenza vaccination justify yearly vaccination for most persons who have a history of GBS and who are at risk for severe complications from influenza.
3. Individuals with bleeding disorders are at risk of hematoma following IM injection.¹²

VIII. INACTIVATED INFLUENZA VACCINE SIDE EFFECTS AND ADVERSE REACTIONS¹

| | |
|---|------------|
| Local reactions: soreness, erythema, induration at injection site | 15%–20 % |
| Fever, malaise, chills | not common |
| Allergic reactions | rare |

IX. OTHER CONSIDERATIONS

1. **Adverse Events:** Epinephrine hydrochloride solution (1:1,000) and other appropriate agents and equipment must be available for immediate use in case of anaphylactic or acute hypersensitivity reaction. Refer to section IV of the Managing Adverse Events Model Standing Order for details on supplies required.
2. **Foreign travelers:** Influenza occurs throughout the year in the tropics. Indications for influenza vaccination should be reviewed before travel. Any person traveling to the tropics, with organized tour groups at any time of the year or to the Southern Hemisphere during April–September, especially those at high risk for flu complications, who want to reduce the risk for influenza infection, should be vaccinated at least 2 weeks before departure.¹⁴
3. **Lactation:** IIV is safe for breastfeeding mothers and their infants. Breastfeeding does not adversely affect the immune response and is not a contraindication for vaccination. RIV has not been tested in pregnant or breast-feeding women.²⁻¹¹
4. **Immunocompromised:** Persons infected with HIV: Since influenza can result in serious illness and complications, vaccination is prudent and will result in protective antibody levels in many recipients. However, the antibody response to vaccine may be low in persons with advanced HIV-related illnesses.¹⁻¹¹

5. **Antiviral agents** for influenza: consult CDC's recommendations for guidance on clinical management of influenza using antiviral agents.¹
6. **Intradermal vaccines:** If there is any doubt that any dose was given subcutaneously (e.g. plunger thrust too vigorously) the dose is invalid and needs to be repeated. Intradermal doses given to persons aged ≤ 12 or ≥ 65 years are also invalid. For persons aged 12-17 years, the dose is valid as long as the clinician is certain that the dose was given intradermally.¹⁵
7. **Hematopoietic Stem Cell Transplant (HSCT) recipients:** IIV should be administered beginning at least 6 months after HSCT and annually thereafter for the life of the patient. A dose of IIV can be given as soon as 4 months after the transplant, but a second dose should be considered in this situation.^{1,12}
8. **Ocular and Respiratory Symptoms after Vaccination:** Oculorespiratory syndrome (ORS) was first described during the 2000-2001 influenza season in Canada. The cause of ORS has not been established. When assessing whether a patient who experienced ocular and respiratory symptoms should be revaccinated, providers should determine whether concerning signs and symptoms were IgE-mediated. If unsure, seek advice from an allergist/immunologist.¹

X. STORAGE AND HANDLING

All clinics and pharmacies enrolled with the Vaccines for Children (VFC) program must report any storage and handling deviations immediately to the Oregon Immunization Program at 971-673-0300.

| Vaccine | Temp | Storage Issues |
|---|--------------------|---|
| Fluzone ^{®2-4} Fluarix ^{®5} Fluvirin ^{®7} Flucelvax ^{®9} Flublok ^{®10} Fluad ^{®11} | Store at 2°–8°C | Store in original package to protect from light. Do not use after the expiration date. Store multidose vial at recommended conditions. Opened multidose vials should be used through the expiration date. |
| FluLaval ^{®6} Afluria ^{®8} | Store at 2°–8°C | Store in original package to protect from light. Store multidose vial at recommended conditions. Do not use after the expiration date. Once the stopper of the multi-dose vial has been pierced the vial must be discarded within 28 days. |

XI: ADVERSE EVENTS REPORTING

Adverse events following immunization must be reported to the Vaccine Adverse Events Reporting System (VAERS). The VAERS online report form is available at <https://vaers.hhs.gov/esub/step1>.

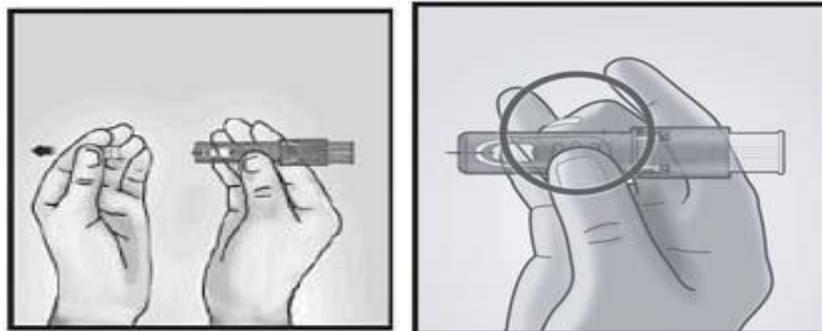
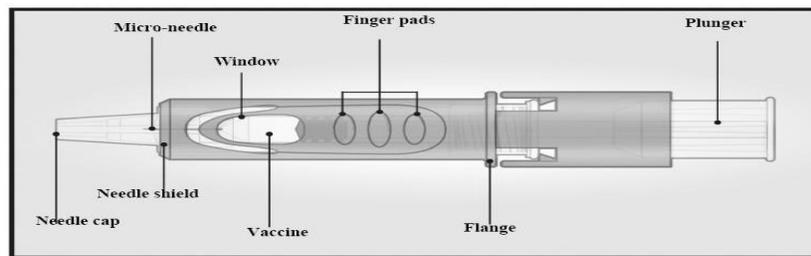
REFERENCES

1. CDC: Prevention and control of influenza with vaccines: Recommendations of the Advisory Committee on Immunization Practices, United States, 2016-2017 influenza season. MMWR;65(5):1–54. Available at: <http://www.cdc.gov/mmwr/volumes/65/rr/pdfs/rr6505.pdf>. Accessed 29 August 2016.
2. Fluzone® High-dose Trivalent 2016–2017 package insert. Available at: www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM305079.pdf. Accessed 15 July 2016.
3. Fluzone® Intradermal Quadrivalent 2016–2017 package insert. Available at: www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM426679.pdf. Accessed 11 August 2016.
4. Fluzone® Quadrivalent 2016–2017 package insert. Available at: www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM404086.pdf. Accessed 26 July 2016.
5. Fluarix Quadrivalent® 2016–2017 package insert. Available at: www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM220624.pdf. Accessed 26 July 2016.
6. FluLaval® Quadrivalent 2016–2017 package insert. Available at: www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM404086.pdf. Accessed 26 July 2016.
7. Fluvirin® IIV3 2016–2017 package insert. Available at: www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM123694.pdf. Accessed 15 July 2016.
8. Afluria® 2016–2017 package insert. Available at: www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM263239.pdf. Accessed 15 July 2016.
9. Flucelvax® IIV3 2016–2017 package insert. Available at: www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM329134.pdf. Accessed 26 July 2016.
10. Flublok® RIV3 2016–2017 package insert. Available at: www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM336020.pdf. Accessed 15 July 2016.
11. Fluad® IIV3 2016–2017 package insert. Available at: www.fda.gov/downloads/BiologicsBloodVaccines/SafetyAvailability/VaccineSafety/UCM474387.pdf. Accessed 12 February 2016.

12. CDC: General recommendations on immunization: Recommendations of the Advisory Committee on Immunization Practices (ACIP), MMWR 2011; 60(2) available at www.cdc.gov/mmwr/pdf/rr/rr6002.pdf Accessed 10 August 2016.
13. CDC. Key facts about seasonal flu vaccine: when should I get vaccinated. Available at: www.cdc.gov/flu/protect/keyfacts.htm. Accessed 10 August 2016.
14. Influenza. In: *CDC Health Information for International Travel 2016*. (“Yellow Book”). Brunette, G. ed. Chapter 3: Epperson, S, Bresee, J. Available at: wwwnc.cdc.gov/travel/yellowbook/2014/chapter-3-infectious-diseases-related-to-travel/influenza. Accessed 11 August 2016.
15. Immunization Action Coalition (IAC), CDC, Ask the Experts: Influenza, intradermal technique. Available at: www.immunize.org/askexperts/experts_inf.asp. Accessed 11 August 2016.
16. Rubin LG, Levin MJ, Ljungman P, et al. 2013 IDSA Clinical Practice Guideline for Vaccination of the immunocompromised host. *Clin Infect Dis* 2014; 58:e44–100. Available at: <http://cid.oxfordjournals.org/content/58/3/e44>. Accessed 11 Aug 2016.

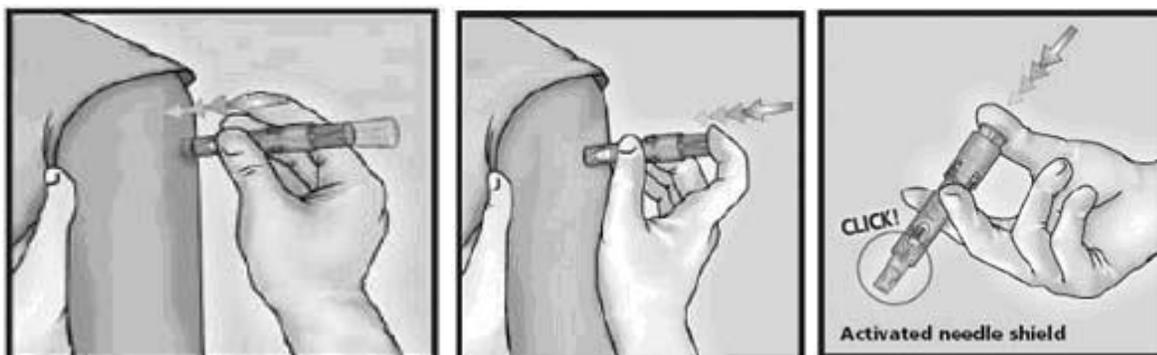
To request this material in an alternative format (e.g., Braille) or to clarify any part of the above order, contact the Oregon Health Authority Immunization Program at 971-673-0300. For other questions, consult with the vaccine recipient’s primary health care provider or a consulting physician.

APPENDIX A: Fluzone Prefilled Intradermal micro injection system³



Remove the needle cap. Hold the system by placing the thumb and middle finger only on the finger pads; the index finger³ remains free.

Do NOT place fingers on the windows.



Insert the needle perpendicular to the skin, in the region of the deltoid, in a short, quick movement. Once the needle has been inserted, maintain light pressure on the surface of the skin and inject using the index finger to push on the plunger.¹⁵ Do NOT aspirate.

Remove needle from skin. Direct device away from client. Activate needle shield by pushing firmly on the plunger. You will hear a click when the shield extends to cover the needle.

Discard device in bio-hazard container.

The Immunization Action Coalition recommends using a less-dominant finger if the index finger is dominant. A less-dominant finger may be used to avoid over-injection into the subcutaneous tissue that makes the dose invalid.¹⁵

APPENDIX B: 2016–2017 Seasonal Influenza Vaccines

| Manufacturer | A strain | A strain | B strain | Additional B strain in quadrivalent vaccine |
|-------------------------|--|---|---|--|
| Afluria ⁸ | A/California/7/2009 (H1N1), NYMC X-181 | A/Hong Kong/4801/2014 (H3N2), NYMC X-263B | B/Brisbane/60/2008 (B/Victoria/2/87 lineage) | |
| FluLaval ⁶ | A/California/7/2009 NYMC X-179A (H1N1) | A/Hong Kong/4801/2014 (H3N2), NYMC X-263B | B/Phuket/3073/2013 (B/Yamagata lineage) virus) | B/Brisbane/60/2008 (B/Victoria/2/87 lineage) |
| Fluarix ⁵ | A/Christchurch/16/2010 NIB-74XP (H1N1) (an A/California/7/2009-like virus) | A/Hong Kong/4801/2014 (H3N2), NYMC X-263B | B/Phuket/3073/2013 (B/Yamagata lineage) virus) | B/Brisbane/60/2008 (B/Victoria/2/87 lineage.) |
| Fluvirin ⁷ | A/Christchurch/16/2010 NIB-74XP (H1N1) (an A/California/7/2009-like virus) | A/Hong Kong/4801/2014, NYMC X-263B (H3N2) | B/Brisbane/60/2008, wild type (a B/Brisbane/60/2008-like virus) | |
| Fluzone ID ³ | A/California/07/2009 NYMC X-179A (H1N1) | A/Hong Kong/4801/2014 (H3N2), NYMC X-263B | B/Phuket/3073/2013 (B/Yamagata lineage) virus) | B/Brisbane/60/2008 (B/Victoria/2/87 lineage.) |
| Fluzone HD ² | A/California/07/2009 X-179A (H1N1) | A/Hong 17 Kong/4801/2014 X-263-B(H3N2) | B/Brisbane/60/2008(B Victoria Lineage) | |
| Flucelvax ⁹ | A/Brisbane/10/2010 (wild type) (H1N1) (an A/California/7/2009-like virus) | A/Hong Kong/4801/2014 (H3N2) | B/Utah/9/2014 (a B/Phuket/3073/2013-like virus) | B/Hong Kong/259/2010 (a B/Brisbane/60/08-like virus) |
| Flublok ¹⁰ | A/California/7/2009 (H1N1) | A/Hong Kong/4801/2014 (H3N2) | B/Brisbane/60/2008 | |

| | | | | |
|----------------------|--|---|--|--|
| Fluad ¹¹ | A/California/7/2009, NYMC X-181 (H1N1) (an A/California/7/2009 pdm09-like virus) | A/Hong Kong/4801/2014, NYMC X-263B (H3N2) (an A/Hong Kong/4801/2014-like virus) | B/Brisbane/60/2008, wild type (a B/Brisbane/60/2008-like virus) | |
| Developing Institute | IVR = Victorian Infectious Diseases Reference Laboratory, Australia | NYMC = New York Medical Center, Reassortment, USA | NIBSC = National Institute for Biological Standards and Control, UK | NIID = National Institute of Infectious Diseases, Japan |