

COVID-19 Vaccines

The charts below provide dosing, storage, adverse effects, and other information for COVID-19 vaccines approved or authorized in the US and Canada. The American Society of Health System Pharmacists has resources related to COVID-19 vaccines at <https://www.ashp.org/COVID-19/Vaccines?loginreturnUrl=SSOCheckOnly>. See end of the chart for links to the **fact sheets** and **product labeling**.

COVID-19 Vaccines Available in the UNITED STATES

VACCINE ^e	DOSE	STORAGE/STABILITY	COMMENTS
<p>Pfizer BioNTech 2023-2024 formula (Omicron XBB.1.5) for ages 6 months through 4 years</p> <p>Pfizer-BioNTech/ mRNA</p> <p>YELLOW cap and label with YELLOW border</p> <p>EUA</p> <p>Requires dilution with 1.1 mL NS per vial.²⁸</p>	<ul style="list-style-type: none"> Each dose is 0.3 mL (3 mcg) IM. Number and timing of doses depends on COVID-19 vaccine history and immunocompetence.²⁸ No previous COVID-19 vaccine: give three doses (at week 0, at week 3, and ≥ 8 weeks after the 2nd dose).²⁸ Previously vaccinated with one dose of any Pfizer-BioNTech COVID-19 vaccine: give two doses (≥ 3 weeks after receipt of the previous dose, and ≥ 8 weeks after the 2nd dose).²⁸ Previously vaccinated with two, three, or four doses of any Pfizer-BioNTech COVID-19 vaccine: give a single dose ≥ 8 weeks after receipt of the last dose.²⁸ Immunocompromised^f individuals should receive at least three doses of COVID-19 vaccine, with at least one dose being the 2023-2024 formula.²⁸ If not previously vaccinated for COVID-19, give three doses, as above. If previously vaccinated with one or two doses of any Pfizer-BioNTech COVID-19 vaccine, complete the remaining dose(s) in the three-dose series as above. If previously vaccinated with ≥ 3 doses of any Pfizer-BioNTech COVID-vaccines, give one dose ≥ 2 months after the last dose.²⁸ 	<ul style="list-style-type: none"> Shipping/long-term storage (ultra-low temp freezer): See footnote d. Refrigerator (2°C to 8°C) (option if vials arrive frozen or refrigerated): 10 weeks (undiluted); 12 hours (diluted).²⁸ Room temperature (up to 25°C): 12 hours undiluted;²⁸ 12 hours once diluted.²⁸ 	<ul style="list-style-type: none"> Anticipated to be effective against current variants based on neutralizing titers against variants XBB.1.5, EG.5.1, and BA.2.86 in volunteers ≥ 12 years of age.²⁹ Neutralizing activity is higher compared to the old bivalent vaccine.²⁹ An eight-week interval between the first and second doses may reduce the small risk of myocarditis/pericarditis.²⁵

VACCINE ^e	DOSE	STORAGE/STABILITY	COMMENTS
<p>Pfizer-BioNTech 2023-2024 formula (Omicron XBB.1.5) for ages 5 through 11 years</p> <p>Pfizer-BioNTech/ mRNA</p> <p>BLUE cap and label with BLUE border²⁸</p> <p>EUA</p> <p>Do NOT dilute.²⁸</p>	<ul style="list-style-type: none"> • Each dose is 0.3 mL (10 mcg) IM.²⁸ • No previous COVID-19 vaccine: give a single dose.²⁸ • Previously vaccinated with ≥ 1 dose of a COVID-19 vaccine: give a single dose ≥ 2 months after receipt of the last dose.²⁸ • Immunocompromised^f individuals should receive at least three doses of COVID-19 vaccine, with at least one dose being the 2023-2024 formula.²⁸ If not previously vaccinated for COVID-19, give three doses, as above. If previously vaccinated with one or two doses of any Pfizer-BioNTech COVID-19 vaccine, complete the remaining dose(s) in the three-dose series as above. If previously vaccinated with ≥ 3 doses of any Pfizer-BioNTech COVID-vaccines, give one dose ≥ 2 months after the last dose.²⁸ 	<ul style="list-style-type: none"> • Shipping/long-term storage (ultra-low temp freezer): See footnote d. • Refrigerator (2°C to 8°C) (option if vials arrive frozen or refrigerated): 10 weeks.²⁸ • Room temperature (up to 25°C): 12 hours.²⁸ 	<ul style="list-style-type: none"> • Anticipated to be effective against current variants based on neutralizing titers against variants XBB.1.5, EG.5.1, and BA.2.86 in volunteers ≥ 12 years of age.²⁹ • Neutralizing activity is higher compared to the old bivalent vaccine.²⁹
<p>Comirnaty 2023-2024 formula (Omicron XBB.1.5) for ages ≥ 12 years^a</p> <p>Pfizer BioNTech/ mRNA</p> <p>Do NOT dilute.</p>	<ul style="list-style-type: none"> • Each dose is 0.3 mL (30 mcg) IM.² • No previous COVID-19 vaccine: give a single dose.² • Previously vaccinated with ≥ 1 dose of a COVID-19 vaccine: give a single dose ≥ 2 months after the last dose.² 	<ul style="list-style-type: none"> • Shipping/long-term storage (ultra-low temp freezer): See footnote d. • Refrigerator (2°C to 8°C): 10 weeks (option if vial/syringes arrive frozen or refrigerated).² • Room Temp (8°C to 25°C): 12 hours, except that frozen prefilled syringes thawed individually at room temp outside the carton must be used within four hours of thawing.² 	<ul style="list-style-type: none"> • Anticipated to be effective against current variants based on neutralizing titers against variants XBB.1.5, EG.5.1, and BA.2.86 in volunteers ≥ 12 years of age. • Neutralizing activity was higher compared to the old bivalent vaccine.²⁹ • Myocarditis/pericarditis: 16.6 cases/million doses in males ages 18 to 29 years (bivalent booster).⁴

VACCINE ^e	DOSE	STORAGE/STABILITY	COMMENTS
<p>Spikevax 2023-2024 formula (Omicron XBB.1.5) for ages ≥12 years</p> <p>Moderna/mRNA</p>	<ul style="list-style-type: none"> • Each dose is 0.5 mL (50 mcg) IM.² • No previous COVID-19 vaccine: give a single dose.² • Previously vaccinated with ≥1 dose of a COVID-19 vaccine: give a single dose ≥2 months after receipt of the last previous dose.³ 	<ul style="list-style-type: none"> • Shipping/long-term storage (freezer): See footnote d. • Refrigerator (2°C to 8°C): 30 days after thawing (prior to first use).³ In-use multi-dose vial: 12 hours.³ • Room temperature (8°C to 25°C): 24 hours total. Discard multidose vials 12 hours after first puncture.³ 	<ul style="list-style-type: none"> • Anticipated to be effective against current variants based on neutralizing titers against XBB.1.5, XBB.1.16, EG.5.1, FL.1.5.1, and BA.2.86 in volunteers 21 to 84 years of age.²⁷ • Local and systemic reactions are similar or less than with older Moderna COVID-19 vaccines.²⁷ • Myocarditis/pericarditis: 23.9 cases/million doses in men 30 to 39 years of age.⁴
<p>Moderna 2023-2024 formula (Omicron XBB.1.5) for ages 6 months through 11 years</p> <p>Moderna/ mRNA</p> <p>DARK BLUE cap and a label with a GREEN box.²¹</p> <p>EUA</p>	<ul style="list-style-type: none"> • 6 months through 4 years of age (dose is 0.25 mL [25 mcg]):²¹ <ul style="list-style-type: none"> ○ No previous COVID-19 vaccine: give two doses at month 0 and at month 1. ○ Previously vaccinated with one dose of any Moderna COVID-19 vaccine: one dose ≥1 month after receipt of the previous dose. ○ Previously vaccinated with ≥2 doses of any Moderna COVID-19 vaccine: one dose ≥2 months after receipt of the last previous dose. • 5 through 11 years of age (dose is 0.25 mL [25 mcg]): give one dose. If previously vaccinated for COVID-19, give ≥2 months after receipt of the last previous dose.²¹ • Immunocompromised^f individuals should receive at least three doses of COVID-19 vaccine, each dose ≥1 months apart, with at least one dose being the 2023-2024 formula.²¹ If previously vaccinated with ≥3 doses, give one dose ≥2 months after the last dose.²¹ 	<ul style="list-style-type: none"> • Shipping/long-term storage (freezer): See footnote d. • Refrigerator (2°C to 8°C): 30 days after thawing (prior to first use).²¹ • Room temperature (8°C to 25°C): 24 hours total.²¹ 	<ul style="list-style-type: none"> • See above. • An eight-week interval between the first and second doses may reduce the risk of small risk of myocarditis/pericarditis.²⁵

VACCINE ^e	DOSE	STORAGE/STABILITY	COMMENTS
<p>Novavax 2023-2024 formula (Omicron XBB.1.5)</p> <p>Novavax/ Recombinant protein subunit, adjuvanted</p> <p>EUA</p>	<ul style="list-style-type: none"> Individuals ≥ 12 years of age not previously vaccinated with any COVID-19 vaccine: two 0.5 mL IM doses three weeks apart.¹⁴ Individuals ≥ 12 years of age who previously received any COVID-19 vaccine: a single 0.5 mL ≥ 2 months after the last previous dose.¹⁴ Immunocompromised^f individuals: an additional dose may be administered ≥ 2 months after the last previous dose.¹⁴ May consider additional doses.¹⁴ 	<ul style="list-style-type: none"> Refrigerator (2°C to 8°C): 12 hours (in-use vial).¹⁴ Room temperature ($\leq 25^\circ\text{C}$): 12 hours (in-use vial).¹⁴ 	<ul style="list-style-type: none"> Anticipated to be effective against current variants based on neutralizing titers against XBB.1.5, XBB.1.16, XBB.2.3, EG.5.1, and XBB.1.16.6.⁷ An eight-week interval between the first and second doses may reduce the small risk of myocarditis/pericarditis.²⁵

--Continue to the next section for the COVID-19 Vaccines Available in Canada chart.--

COVID-19 Vaccines Available in CANADA

VACCINE ^e	DOSE (Primary Series)	DOSE (Booster) (also see footnote c)	STORAGE/STABILITY	COMMENTS
<p><i>Comirnaty</i> (Omicron XBB.1.5) for ages 6 months through 4 years (Pfizer-BioNTech)/mRNA</p> <p>MAROON cap and label border¹⁸</p> <p>Requires dilution with 2.2 mL NS per vial.¹⁸</p>	<p>Primary vaccination for 6 months through 4 years of age: three 0.2 mL (3 mcg) IM doses. The first two doses are given three weeks apart (8-week interval preferred), followed by a 3rd dose ≥ 8 weeks after the 2nd dose.^{18,20}</p>	<p>Booster (6 months through 4 years of age): one 0.2 mL (3 mcg) IM dose ≥ 6 months after the last previous dose.¹⁸</p>	<p>Shipping/long-term storage (ultra-low temp freezer, freezer): See footnote d.</p> <p>Refrigerator (2°C to 8°C) (option if vials arrive frozen or refrigerated): 10 weeks undiluted; 12 hours once diluted (vial).¹⁸</p> <p>Room Temp (up to 25°C): 12 hours (undiluted); 12 hours (once diluted [vial]).¹⁸</p> <p>Vaccine should not be used after 18 months from date of manufacture.¹⁸</p>	<ul style="list-style-type: none"> • Anticipated to be effective against current variants based on neutralizing titers against variants XBB.1.5, EG.5.1, and BA.2.86 in volunteers ≥ 12 years of age.²⁹ • Neutralizing activity is higher compared to the old bivalent vaccine.²⁹
<p><i>Comirnaty</i> (Omicron XBB.1.5) for ≥ 12 years of age^a (Pfizer-BioNTech)/mRNA</p> <p>GRAY cap and label border¹⁸</p> <p>Do NOT dilute.¹⁸</p>	<p>Primary vaccination for ≥ 12 years of age: a single 0.3 mL (30 mcg) IM dose.¹⁸</p>	<p>Booster (≥ 12 years of age): one 0.3 mL (30 mcg) IM dose ≥ 6 months (approved for ≥ 3 months) after the last previous dose.¹⁸</p>	<p>Shipping/long-term storage (ultra-low temp freezer, freezer): See footnote d.</p> <p>Refrigerator (2°C to 8°C): 10 weeks (unpunctured vial).¹⁸ 12 hours (punctured vial).¹⁸</p> <p>Room Temp (up to 25°C): 12 hours prior to first use.¹⁸ Discard vials 12 hours after first puncture.¹⁸</p> <p>Vaccine should not be used after 18 months from date of manufacture.¹⁸</p>	<ul style="list-style-type: none"> • See above.

VACCINE ^e	DOSE (Primary Series)	DOSE (Booster) (also see footnote c)	STORAGE/STABILITY	COMMENTS
<p><i>Comirnaty</i> (Omicron XBB.1.5) for ages 5 through 11 years (Pfizer-BioNTech)/mRNA</p> <p>ORANGE cap and label border¹⁸</p> <p>Requires dilution with 1.3 mL of NS per vial.¹⁸</p>	<p>Primary vaccination for 5 to 11 years of age: a single 0.2 mL (10 mcg) IM dose.¹⁸</p>	<p>Booster (5 through 11 years of age): one 0.2 mL (10 mcg) IM dose ≥ 6 months after last previous dose.¹⁸</p>	<p>Shipping/long-term storage (ultra-low temp freezer, freezer): See footnote d.</p> <p>Refrigerator (2°C to 8°C) (option if vials arrive frozen or refrigerated): 10 weeks undiluted; 12 hours once diluted.¹⁸</p> <p>Room Temp (up to 25°C): 12 hours (undiluted); 12 hours once diluted.¹⁸</p> <p>Vaccine should not be used after 18 months from date of manufacture.¹⁸</p>	<ul style="list-style-type: none"> • See above.
<p><i>Comirnaty</i> (Omicron XBB.1.5) for ages 5 through 11 years (Pfizer-BioNTech)/mRNA</p> <p>BLUE cap and label border.¹⁸</p> <p>Do NOT dilute.¹⁸</p>	<p>Primary vaccination for 5 to 11 years of age: a single 0.3 mL (10 mcg) IM dose.¹⁸</p>	<p>Booster (5 through 11 years of age): one 0.3 mL (10 mcg) IM dose ≥ 6 months after last previous dose.¹⁸</p>	<p>Shipping/long-term storage (ultra-low temp freezer, freezer): See footnote d.</p> <p>Refrigerator (2°C to 8°C): 10 weeks (unpunctured vial).¹⁸ 12 hours (punctured vial).¹⁰</p> <p>Room Temp (up to 25°C): 12 hours prior to first use.¹⁸ Discard vials 12 hours after first puncture.¹⁸</p> <p>Vaccine should not be used after 18 months from date of manufacture.¹⁸</p>	<ul style="list-style-type: none"> • See above.

VACCINE ^e	DOSE (Primary Series)	DOSE (Booster) (also see footnote c)	STORAGE/STABILITY	COMMENTS
<p>Comirnaty (original and Omicron BA.4/BA.5) for ≥12 years of age^a (Pfizer-BioNTech)/ mRNA</p> <p>GRAY cap and label border.²⁶</p> <p>Do NOT dilute.²⁶</p>	<p>Primary vaccination for ≥12 years of age: two 0.3 mL (30 mcg) IM doses 3 weeks apart (≥8-week interval preferred).^{16,26}</p> <p>Immunocompromised^f: As above plus 3rd dose, with 4 to 8 weeks between each of the three doses.¹⁶ (<i>Spikevax</i> bivalent may be preferred.¹⁶)</p>	<p>Booster (≥12 years of age):^c one 0.3 mL (30 mcg) IM dose ≥6 months (approved for ≥3 months) after the last previous dose.²⁶</p>	<p>Shipping/long-term storage (ultra-low temp freezer, freezer): See footnote d.</p> <p>Refrigerator (2°C to 8°C): 10 weeks (unpunctured vial).²⁶</p> <p>Room Temp (up to 25°C): 12 hours (unpunctured vial).²⁶</p> <p>Discard vials 12 hours after first puncture.²⁶</p> <p>Vaccine should not be used after 18 months from date of manufacture.²⁶</p>	<ul style="list-style-type: none"> Approval based on immunogenicity data from a different bivalent vaccine (original and Omicron BA.1) in individuals ≥55 years of age.²⁶ Also see footnote b.
<p>Comirnaty (original and Omicron BA.4/BA.5) for 5 through 11 years of age (Pfizer-BioNTech)/ mRNA</p> <p>ORANGE cap and label border²⁶</p> <p>Requires dilution with 1.3 mL of NS per vial.²⁶</p>	<p>Primary vaccination for 5 to 11 years of age: two 0.2 mL (10 mcg) IM doses ≥8-weeks apart.¹⁶</p> <p>Immunocompromised: as above plus 3rd dose, with 4 to 8 weeks between each of the three doses.¹⁶ (<i>Spikevax</i> bivalent may be preferred.¹⁶)</p>	<p>Booster (5 through 11 years of age):^c one 0.2 mL (10 mcg) IM dose ≥6 months after the last previous dose.²⁶</p>	<p>Shipping/long-term storage (ultra-low temp freezer, freezer): See footnote d.</p> <p>Refrigerator (2°C to 8°C): 10 weeks (undiluted). 12 hours once diluted.²⁶</p> <p>Room Temp (up to 25°C): 12 hours (undiluted). 12 hours once diluted.²⁶</p> <p>Vaccine should not be used after 18 months from date of manufacture.²⁶</p>	<p>See above.</p>

VACCINE ^e	DOSE (Primary Series)	DOSE (Booster) (also see footnote c)	STORAGE/STABILITY	COMMENTS
<p><i>Comirnaty</i> (original and Omicron BA.4/BA.5) for 6 months through 4 years of age (Pfizer-BioNTech)/ mRNA</p> <p>MAROON cap and label border²⁶</p> <p>Requires dilution with 2.2 mL of NS per vial.²⁶</p>	<p>Primary vaccination for 6 months through 4 years of age: three 0.2 mL (3 mcg) IM doses. The first two doses are given three weeks apart (8 weeks preferred), followed by a 3rd dose \geq8 weeks after the 2nd dose.^{20,26}</p> <p>Immunocompromised: as above plus 3rd dose, with 4 to 8 weeks between each of the three doses.¹⁶ (<i>Spikevax</i> bivalent may be preferred.¹⁶)</p>	N/A	<p>Shipping/long-term storage (ultra-low temp freezer, freezer): See footnote d.</p> <p>Refrigerator (2°C to 8°C): 10 weeks (undiluted). 12 hours once diluted.²⁶</p> <p>Room Temp (up to 25°C): 12 hours (undiluted). 12 hours once diluted.²⁶</p> <p>Vaccine should not be used after 18 months from date of manufacture.²⁶</p>	See above.
<p><i>Comirnaty</i> (original) for ages 6 months through 4 years (Pfizer-BioNTech)/ mRNA</p> <p>MAROON cap and label border¹¹</p> <p>Requires dilution with 2.2 mL NS per vial.¹¹</p>	<p>Primary vaccination for 6 months through 4 years of age: three 0.2 mL (3 mcg) IM doses. The first two doses are given three weeks apart (8-week interval preferred), followed by a 3rd dose \geq8 weeks after the 2nd dose.^{11,20}</p> <p>Immunocompromised^f: As above plus 4th dose, with 4 to 8 weeks between each of the four doses.²⁰</p>	N/A	<p>Shipping/long-term storage (ultra-low temp freezer, freezer): See footnote d.</p> <p>Refrigerator (2°C to 8°C) (option if vials arrive frozen or refrigerated): 10 weeks undiluted; 12 hours once diluted (vial).¹¹</p> <p>Room Temp (up to 25°C): 12 hours (undiluted); 12 hours (once diluted [vial]).¹¹</p> <p>Stable in pre-drawn syringe for 12 hours at room temperature (up to 30°C).¹⁰</p> <p>Vaccine should not be used after 18 months from date of manufacture.¹⁸</p>	<ul style="list-style-type: none"> • Efficacy against symptomatic infection ~2 months after the third dose was >70% (Omicron-predominant period).²⁰

VACCINE ^e	DOSE (Primary Series)	DOSE (Booster) (also see footnote c)	STORAGE/STABILITY	COMMENTS
<p><i>Spikevax XBB.1.5</i> for ages 6 months and older</p> <p>Moderna/mRNA</p> <p>ROYAL BLUE cap with label with LIGHT BLUE border</p>	<p>Primary vaccination:</p> <ul style="list-style-type: none"> • 6 months to 4 years of age: two 0.25 mL (25 mcg) doses four weeks apart.²⁴ • 5 to 11 years of age: one 0.25 mL (25 mcg) dose.²⁴ • ≥12 years of age: one 0.5 mL (50 mcg) dose.²⁴ 	<p>Booster:</p> <ul style="list-style-type: none"> • 6 months to 4 years of age: one 0.25 mL (25 mcg) dose ≥6 months after the previous COVID-19 vaccine dose.²⁴ • 5 to 11 years of age: one 0.25 mL (25 mcg) dose ≥6 months after the previous COVID-19 vaccine dose.²⁴ • ≥12 years of age: one 0.5 mL (50 mcg) dose ≥6 months after the previous COVID-19 vaccine dose.²⁴ 	<p>Shipping/long-term storage (freezer): See footnote d.</p> <p>Refrigerator (2°C to 8°C): 30 days after thawing (prior to first use).²⁴ In-use vial: 24 hours.²⁴</p> <p>Room Temp (8°C to 25°C): unpunctured or in-use vial: 24 hours total.²⁴</p>	<ul style="list-style-type: none"> • Anticipated to be effective against current variants based on neutralizing titers against XBB.1.5, XBB.1.16, EG.5.1, FL.1.5.1, and BA.2.86 in volunteers 21 to 84 years of age.²⁷ • Local and systemic reactions are similar or less than with older Moderna COVID-19 vaccines.²⁷
<p><i>Spikevax</i> (original) (Moderna)/mRNA</p> <p>RED cap and label with a light blue border (0.2 mg/mL)²²</p>	<p>Primary vaccination for ≥12 years of age: two 0.5 mL (100 mcg) IM doses 4 weeks apart (8-week interval preferred).^{20,22} (<i>Comirnaty</i> preferred if 18 to 29 years of age.²⁰)</p> <p>6 to 11 years of age: two 0.25 mL (50 mcg) IM doses 4 weeks apart (≥8-week interval preferred).^{20,22}</p> <p>Immunocompromised^f: as above plus 3rd dose, with 4 to 8 weeks between each of the three doses.^{20,22}</p>	<p>Booster (≥12 years of age):^c one 0.25 mL (50 mcg) IM dose ≥6 months (approved for ≥4 months) after the last previous dose.^{20,22}</p> <p>Immunocompromised^f: as above.²⁰</p>	<p>Shipping/long-term storage (freezer): See footnote d.</p> <p>Refrigerator (2°C to 8°C): 30 days after thawing (prior to first use).²² In-use vial: 24 hours.²² Pre-drawn syringe: 12 hours from first puncture of source vial.¹⁰</p> <p>Room Temp (8°C to 25°C): unpunctured or in-use vial: 24 hours total.²² Pre-drawn syringe: 12 hours from first puncture of source vial.¹⁰</p>	<ul style="list-style-type: none"> • Case-control data in adults suggests that three doses were 61% effective against symptomatic infection, and 95% effective against severe outcomes from the Omicron variant circulating in Ontario in December 2021.¹³ • Delayed-type hypersensitivity reaction (e.g., large, red area near injection site) reported most often about a week after first shot. May be itchy, painful, warm, or swollen, and can also involve fingers, elbow, or palm. Not a contraindication to subsequent vaccination.¹⁵

VACCINE ^e	DOSE (Primary Series)	DOSE (Booster) (also see footnote c)	STORAGE/STABILITY	COMMENTS
<p>Spikevax (original) (Moderna)/ mRNA</p> <p>ROYAL blue cap and a label with a PURPLE border²² (0.1 mg/mL)</p> <p>Approved for primary series (6 months through 11 years) and 50 mcg booster (≥12 years of age)²²</p>	<p>Primary vaccination for 6 months through 5 years of age: two 0.25 mL (25 mcg) IM doses 4 weeks apart (≥8 weeks preferred).^{20,22}</p> <p>Primary vaccination for 6 through 11 years of age: two 0.5 mL (50 mcg) IM doses 4 weeks apart (≥8 weeks preferred).^{20,22}</p> <p>Immunocompromised: as above plus 3rd dose, with 4 to 8 weeks between each of the three doses.^{20,22}</p>	<p>Booster (≥12 years of age):^c one 0.5 mL (50 mcg) IM dose ≥6 months (approved for ≥4 months) after the last previous dose.^{20,22}</p>	<p>Shipping/long-term storage (freezer): See footnote d.</p> <p>Refrigerator (2°C to 8°C): 30 days after thawing (prior to first use).²² In-use vial: 24 hours.²²</p> <p>Room Temp (8°C to 25°C): in-use vial: 24 hours.²²</p>	<ul style="list-style-type: none"> • Efficacy ~60% against symptomatic Omicron infection (ages 3 to 5 years, 2 weeks to 2 months post-vaccination).¹²
<p>Spikevax Bivalent (original and Omicron BA.1) (Moderna)/ mRNA</p> <p>ROYAL blue cap and label with GREEN border¹</p>	<p>Primary vaccination for 6 months through 11 years of age: two 0.25 mL (25 mcg) IM doses ≥8 weeks apart.¹⁶</p> <p>Primary vaccination for ≥12 years of age: two 0.5 mL (50 mcg) IM doses 8 weeks apart.¹⁶ (<i>Comirnaty</i> bivalent preferred for ages 12 to 29 years.¹⁶)</p> <p>Immunocompromised: as above plus 3rd dose, with 4 to 8 weeks between each of the three doses.¹⁶</p>	<p>Booster (6 to 11 years of age):^c one 0.25 mL (25 mcg) IM dose ≥6 months after the last previous dose.^{1,20}</p> <p>Booster (≥12 years of age): one 0.5 mL (50 mcg) dose ≥6 months (approved ≥4 months) after the last previous dose.^{1,20}</p>	<p>Shipping/long-term storage (freezer): See footnote d.</p> <p>Refrigerator (2°C to 8°C): 30 days after thawing (prior to first use).¹ In-use vial: 24 hours.¹</p> <p>Room Temp (8°C to 25°C): 24 hours after vial puncture (vial or filled syringe).¹</p>	<ul style="list-style-type: none"> • Approval based on immunogenicity data.¹

VACCINE ^e	DOSE (Primary Series)	DOSE (Booster) (also see footnote c)	STORAGE/STABILITY	COMMENTS
<p>Spikevax Bivalent (original and Omicron BA.4/BA.5) (Moderna)/ mRNA</p> <p>ROYAL blue cap and label with GREY border¹⁹</p>	<p>Primary vaccination for 6 months through 11 years of age: two 0.25 mL (25 mcg) IM doses \geq8 weeks apart.¹⁶</p> <p>Primary vaccination for \geq12 years of age: two 0.5 mL (50 mcg) IM doses 8 weeks apart.¹⁶ (<i>Comirnaty</i> bivalent preferred for ages 12 to 29 years.¹⁶)</p> <p>Immunocompromised: as above plus 3rd dose, with 4 to 8 weeks between each of the three doses.¹⁶</p>	<p>Booster (6 to 11 years of age):^c one 0.25 mL (25 mcg) IM dose \geq6 months after the last previous dose.^{19,20}</p> <p>Booster (\geq12 years of age):^c one 0.5 mL (50 mcg) dose \geq6 months (approved \geq4 months) after the last previous dose.^{19,20}</p>	<p>Shipping/long-term storage (freezer): See footnote d.</p> <p>Refrigerator (2°C to 8°C): 30 days after thawing (prior to first use).¹⁹ In-use vial or filled syringe: 24 hours.¹⁹</p> <p>Room Temp (8°C to 25°C): 24 hours total, in-use vial, filled syringe, or unpunctured vial.¹⁹</p>	<ul style="list-style-type: none"> Approval based on immunogenicity data.¹ Also see footnote b.
<p>Nuvaxovid (Novavax)/ Recombinant protein subunit, adjuvanted</p> <p>mRNA vaccine preferred.²⁰</p>	<p>Primary vaccination for \geq12 years of age: two 0.5 mL IM doses three weeks apart (8-week interval preferred).^{8,20}</p> <p>Immunocompromised^f: As above, plus 3rd dose, with 4 to 8 weeks between each of the three doses (mRNA vaccine preferred).²⁰</p>	<p>Booster (\geq18 years of age):^c one 0.5 mL IM dose \geq6 months after the last previous dose.^{8,20}</p>	<p>Refrigerator (2°C to 8°C): 12 hours (in-use vial) or 6 hours (pre-drawn syringe).^{8,10}</p> <p>Room Temp (\leq25°C): 6 hours (in-use vial or pre-drawn syringe).^{8,10}</p>	<ul style="list-style-type: none"> Effectiveness estimates unknown for current variants.²⁰

- a. The adult formulation of the Pfizer-BioNTech vaccine **CANNOT** be used for children <12 years of age by using a dose-adjusted volume. This is because the resulting volume is too small for an intramuscular injection.⁶
- b. **Efficacy:** In a US cohort from September 2022 to August 2023, absolute efficacy of the bivalent booster (Original and Omicron BA.4/BA.5) against **hospitalization** in immunocompetent adults vs receiving no previous COVID-19 vaccine doses was as high as 65% (95% CI 61 to 69), seven to 59 days post-vaccination.⁵ This waned to 48% (95% CI 42 to 53) 60 to 119 days post-vaccination.⁵ Note that many of the patients in these studies likely had at least some natural immunity, which would reduce relative efficacy of the booster. For the most current CDC-authored vaccine effectiveness studies, see COVID-19 Vaccine Effectiveness Monthly Update at <https://covid.cdc.gov/covid-data-tracker/#vaccine-effectiveness>.
- c. XXB.1.5-containing formulation is recommended to all individuals ≥ 6 months of age previously vaccinated against COVID-19, especially those at increased risk, if it has been ≥ 6 months since their last COVID-19 vaccine dose.⁹
- d. See product labeling for storage in ultra-low freezer or freezer and thawing before use, as applicable.
- e. Tips to **minimize vaccine waste** include:^{10,23}
 - Maintain the cold chain to prevent waste due to inappropriate storage conditions.
 - Maximize doses drawn from multidose vials using:
 - low dead-volume syringes/needles.
 - techniques to minimize leakage (e.g., multiple puncture locations in the rubber stopper instead of the same location over and over [this can create a larger hole]).
 - Draw up an appropriate number of syringes based on expected vaccination appointments for the day.
 - Monitor appointment cancellations and no-shows throughout the day. Then draw up afternoon doses based on the revised appointment list.
 - Use syringes in order of expiration time, starting with the earliest expiration date.
 - Maintain a waiting list to contact people at the end of the day if there are extra doses available.
- f. **US:** Immunocompromise = solid organ transplant patients or similar level of immunocompromise. For a full list of CDC-recommended conditions, see <https://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html#immunocompromised>.
Canada: To see a full list of **immunocompromising conditions**, see the Canadian Immunization Guide: <https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-3-vaccination-specific-populations/page-8-immunization-immunocompromised-persons.html>.

Abbreviations: EUA = Emergency Use Authorization; IM = intramuscular; NS = normal saline

The CDC has interim recommendations for **COVID-19 vaccine administration errors and deviations** available at <https://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us-appendix.html#appendix-d>.

Fact Sheets and Product Labeling

- Comirnaty vaccine. Product information (US): <https://www.fda.gov/media/151707/download?attachment>.
- Pfizer-BioNTech vaccine for 6 months through 11 years of age. EUA fact sheet for healthcare professionals (US): <https://www.fda.gov/media/167211/download?attachment>.
- Pfizer-BioNTech vaccine for 6 months through 11 years of age. EUA fact sheet for patients (US): <https://www.fda.gov/media/167212/download?attachment>.

- *Spikevax* vaccine. Prescribing information (US): <https://www.fda.gov/media/155675/download?attachment>.
- *Spikevax* vaccine. Patient package insert (US): <https://www.fda.gov/media/155762/download?attachment>.
- Moderna vaccine for 6 months through 11 years of age. . EUA fact sheet for healthcare professionals (US): <https://www.fda.gov/media/167208/download?attachment>.
- Moderna vaccine for 6 months through 11 years of age: EUA fact sheet for patients (US): <https://www.fda.gov/media/167209/download?attachment>.
- Novavax vaccine EUA fact sheet for healthcare professionals (US): <https://www.fda.gov/media/159897/download>.
- Novavax vaccine fact sheet for patients (US): <https://www.fda.gov/media/159898/download>.

Current Canadian product monographs for Covid-19 vaccines available in Canada can be found at Health Canada's COVID-19 Vaccines and Treatments Portal (<https://covid-vaccine.canada.ca/>)

Users of this resource are cautioned to use their own professional judgment and consult any other necessary or appropriate sources prior to making clinical judgments based on the content of this document. Our editors have researched the information with input from experts, government agencies, and national organizations. Information and internet links in this article were current as of the date of publication.

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