

Strategies to Prevent COVID-19 and Influenza Vaccine Errors

November 2023

Overview

This document is a compilation of strategies used by BC Health Authorities and based on the Institute for Safe Medication Practices (ISMP) Canada's Strategies for Safe Immunization with COVID-19 Vaccines. With the number of COVID-19 and influenza vaccines available and similarities in the appearance of vials, the aim of this document is to share learnings and strategies to mitigate errors with COVID-19 and influenza vaccines. These strategies will be added to and will evolve over time as more learnings are incorporated.

A consistent strategy used across the ISMP documents and the Health Authority strategies is to take sufficient time to prepare and administer the vaccine(s). The Decision Support Tools and best practice guidelines found within the [BC Immunization Manual](#) should be followed when administering COVID-19 and influenza vaccines to prevent errors or deviations from occurring. The 7 "Rights" of medication administration (i.e., right product, right client, right dose, right time, right route, right reason, and right documentation) should be used when administering any vaccine.

The strategies below are offered for consideration and some or all can be implemented as appropriate. COVID-19 and influenza vaccines may be administered in different settings (e.g., community-based clinics, pharmacies, public health units, community health centres) and the strategies below may need to be tailored to a respective setting. Space and number of staff available may impact the strategies that can be implemented. Organizations may have additional error mitigation strategies and processes in place. When an error does occur, please follow your organization's policies and procedures for reporting and follow-up.

Thank you to the BC Health Authorities for sharing their learnings and resources on error mitigation.

Stage when error may occur	Risk of error	Error Mitigation Strategies
Training/support for continued competency	<ul style="list-style-type: none"> ▪ Varying levels of immunization experience and education ▪ Information evolving rapidly 	<p>Immunizers are responsible to only perform duties within their scope of practice. Immunizers must have the knowledge and skills for all vaccine products they will be handling, preparing and administering.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Ensure immunizers have completed the required education, orientation and mentorship. <input type="checkbox"/> Support immunizers to self-identify when additional support, training or mentorship is needed. <input type="checkbox"/> Have roles and responsibilities of all staff at the clinic defined and ensure staff are aware. A region/site-specific roles and responsibilities document could be created to outline these. <input type="checkbox"/> Immunizers have easy access to necessary clinical resources (e.g., BC Immunization Manual). <input type="checkbox"/> Ensure immunizers are familiar with the process for receiving the most recent BC Immunization Manual updates and any health authority or site-specific updates. <input type="checkbox"/> Implement a communication system for sharing information at the start of each shift (e.g., safety huddles, communication board/binder). <input type="checkbox"/> Have a system in place to ensure any printed resources are replaced when updates to the resources occur to ensure only the most up-to-date resources are on hand. <input type="checkbox"/> Have a system in place for staff who have not worked in the clinic recently to support them getting up-to-date with any clinical or procedural updates. <input type="checkbox"/> The process for reporting errors should be made clear to staff members. Ensure errors are systematically recorded and have a supportive process for follow-up and sharing of learnings after an error is reviewed. <input type="checkbox"/> Encourage staff to ask questions, contribute suggestions and double check their practices to create a culture of error prevention.
Clinic set-up and flow	<ul style="list-style-type: none"> ▪ There may be a number of distractions in a 	<ul style="list-style-type: none"> <input type="checkbox"/> Schedule rest periods and task rotation to support staff alertness. <input type="checkbox"/> Limit distractions and minimize noise levels.

Stage when error may occur	Risk of error	Error Mitigation Strategies
	<p>busy clinic setting that could contribute to inadvertent errors</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Book interpreter(s) in advance if needed and allow for more time if an interpreter is required. <input type="checkbox"/> Repeat screening questions with the client and/or guardian at multiple checkpoints (e.g., at registration, pre-administration) to confirm each client’s eligibility. <input type="checkbox"/> Designate private space in community clinics for those requiring additional support (e.g., clients who may be needle phobic). <input type="checkbox"/> Develop colour-coded and labeled age cards to be given to clients at check-in. <input type="checkbox"/> Continuously review workflow to identify areas for improvement and to further mitigate errors.
<p>Storage and Handling</p>	<ul style="list-style-type: none"> ▪ Potential for selection of expired product ▪ Potential for wastage of vaccine due to a break in cold chain, with inadequate equipment or processes in place ▪ Potential for incorrect product to be taken when multiple products are stored close together 	<ul style="list-style-type: none"> <input type="checkbox"/> Check the accuracy of thermometers. <input type="checkbox"/> Check and record the minimum and maximum refrigerator temperatures (and freezer temperatures if applicable) as well as the room temperature, for a minimum of twice daily on all business days or as required by your jurisdiction. <input type="checkbox"/> Have a system in place to regularly review refrigerated/frozen vaccines. Rotate vaccine stock (i.e., vaccine expiring first is used first) and remove any expired product (including diluent). <input type="checkbox"/> Store different vaccine formulations separately from one another (e.g., store each formulation in separate plastic bins labeled with the product name and corresponding age group). <input type="checkbox"/> Ensure the most up-to-date vaccine-specific cold chain standard operating procedures are posted near the vaccine fridge. <input type="checkbox"/> Ensure COVID-19 and influenza products are clearly differentiated from one another when using multiple products in a clinic, due to different storage and handling considerations (e.g., influenza vaccines should not be left at room temperature). <input type="checkbox"/> For COVID-19 vials: Clearly label all vials with thaw date and time.

Stage when error may occur	Risk of error	Error Mitigation Strategies
		<ul style="list-style-type: none"> <input type="checkbox"/> Consider bundling any required diluent together with the vaccine (e.g., upon removal of the vaccine from the freezer). <input type="checkbox"/> Ensure there is a contingency plan to maintain cold chain in the event of a power outage. <input type="checkbox"/> Ensure staff are aware of steps to be taken when a cold chain excursion is identified. <input type="checkbox"/> When vaccines are moved from the fridge to a cooler, check to ensure it is the correct product and the expiry date. <input type="checkbox"/> Bring only the vaccine formulations needed for the intended population at the clinic.
<p>Vaccine Preparation</p>	<ul style="list-style-type: none"> ▪ Incorrect volume of vaccine drawn ▪ Incorrect vaccine product drawn ▪ Incorrect dilution of products requiring dilution ▪ Drawing up of a vaccine beyond its expiry ▪ Vaccine drawn up into a syringe and incorrectly labeled as to the product it contains 	<ul style="list-style-type: none"> <input type="checkbox"/> Refer to the Decision Support Tool, the BC Immunization Manual, Part 4, COVID-19 Vaccines, for correct dose per product, age and dose in the series. <input type="checkbox"/> Develop a standardized process for vaccine preparation, including procedures for vaccines that require dilution and those that do not require dilution. <input type="checkbox"/> Use the BCCDC Vaccine Comparison Tables as a supplementary resource for identifiers of each product. <ul style="list-style-type: none"> ○ Be aware of vial cap colours, label border colours, as well as reading the vial labels. <input type="checkbox"/> Drawing up multiple doses of a vaccine prior to administration is not best practice and is strongly discouraged, particularly when more than one biological product is being administered at the clinic. If the decision is made to draw up multiple doses of a biological product, label all pre-drawn syringes with the product name, dose, lot number, time of first vial puncture (if multidose vial), time it was drawn up, and use-by time. Place pre-drawn vaccines in labeled product and age-specific containers. <ul style="list-style-type: none"> ○ Additional parameters for Drawing up Multiple Doses of a Biological Product are included in Appendix B of the BC Immunization Manual. <input type="checkbox"/> When labeling, use terms such as ‘and older’ or ‘and younger’ instead of ‘>’ and ‘<’ as the symbols could be mistaken for the opposite of what was intended.

Stage when error may occur	Risk of error	Error Mitigation Strategies
		<ul style="list-style-type: none"> <input type="checkbox"/> Based on space and staffing availability, separate preparation and administration areas for each vaccine formulation, making special note to clearly distinguish between adult and pediatric vaccine dosing. Ensure clear signage, distinctly labelled vials and syringes, and clearly outlined check processes to avoid product or dose mix-ups. <input type="checkbox"/> Never leave vaccine unattended at a work station. <input type="checkbox"/> When drawing up COVID-19 vaccine and influenza vaccine for co-administration at a table, ensure that vaccines are well identified (e.g., use tray with labels and colour coding). <input type="checkbox"/> Incorporate independent double checks at key points in the preparation process to ensure correct vaccine formulation and dose is prepared and labelled correctly. For example, when taking the vaccine from the fridge/cooler and when drawing up. <ul style="list-style-type: none"> <input type="checkbox"/> Include a check to ensure that the connection between the needle and syringe is secure. <input type="checkbox"/> If using separate pre-drawing and vaccine administration stations, when the immunizer picks up the vaccine for administration, they could review the client information with the person drawing up the vaccine to ensure they are taking the correct dose and the correct vaccine for that particular client.
Administration	<ul style="list-style-type: none"> ▪ Administration of a product or dose intended for a different age group ▪ Administration of dose at less than minimum/recommended interval 	<ul style="list-style-type: none"> <input type="checkbox"/> Check the electronic documentation system before administering the vaccine to verify client identifiers, previous doses, adequate spacing, age appropriate product, and consent. <ul style="list-style-type: none"> <input type="checkbox"/> Confirm at least 2 identifiers with the client and/or guardian (e.g., name and birth date), and confirm the client's age. <input type="checkbox"/> Confirm that no other doses have been received out of province that may not have been captured in the electronic documentation system. <input type="checkbox"/> Repeat screening questions with the client and/or guardian to confirm each client's eligibility.

Stage when error may occur	Risk of error	Error Mitigation Strategies
	<ul style="list-style-type: none"> ▪ Incorrect administration technique 	<ul style="list-style-type: none"> ○ Use the BCCDC COVID-19 Vaccine Screening Checklist to identify vaccine contraindications or precautions ☐ Refer to the Decision Support Tool, the BC Immunization Manual Part 4, for correct dose by product and age. ☐ Ensure that the immunizer who reviews the consent administers the vaccine(s). ☐ Only bring the vaccines that are intended for one client to the vaccination area at any time. ☐ Follow the 7 Rights of Medication Administration (i.e., right product, right client, right dose, right time, right route, right reason, and right documentation). ☐ Check 3 times that it is the correct product and dose for the intended client: <ul style="list-style-type: none"> ○ If the site is using pre-drawn syringes this would include: 1) When the immunizer picks up the labeled vaccine, 2) when the immunizer returns to their station, and 3) prior to the administration of the vaccine. ○ If the immunizer is drawing up their own vaccine, this would be: 1) When the vaccine is taken from the fridge/cooler, 2) before preparing the vaccine, and 3) prior to the administration of the vaccine. ○ Before starting each injection, conduct a visual check of the dose, the syringe-needle attachment, and all labelling. Include a check for large air bubbles and particulates. ○ The final check to confirm correct vaccine could include the client (or guardian) in verifying the vaccine, formulation and dose by showing them the label and/or reading the label aloud. ☐ Consult with the immunization lead or Medical Health Officer (MHO) for client-specific immunization questions. ☐ Implement strategies to reduce immunization injection pain and appropriate positioning of client to prevent inadvertent movement during immunization.

Stage when error may occur	Risk of error	Error Mitigation Strategies
		<ul style="list-style-type: none"> <input type="checkbox"/> Ensure that age-appropriate injection site landmarking is performed prior to vaccine administration to prevent shoulder injury related to vaccine administration (SIRVA).
Documentation	<ul style="list-style-type: none"> ▪ Documentation of vaccine administration in incorrect client file ▪ Entry of lot number, product or dose that does not correspond to the vaccine that was administered 	<ul style="list-style-type: none"> <input type="checkbox"/> Ensure documentation in the correct client record by verifying client identifiers with the client/guardian <input type="checkbox"/> Where possible, the lot number could be selected in the system prior to vaccine administration. This could help as an additional check that the lot number selected corresponds to the intended product prior to administration. <input type="checkbox"/> To prevent automation errors such as with the use of pre-sets, enter name of the biological product, lot number and dose manually if possible. <input type="checkbox"/> Document lot number directly from vaccine label (from the syringe or vial). <input type="checkbox"/> If completing a downtime form, document all indicated information on the form and ensure it is legible. <input type="checkbox"/> Provide client with documentation of vaccination, including product name, lot number, and date of vaccination.

References

Institute for Safe Medication Practices Canada. Do not use: Dangerous abbreviations, symbols and dose designations. 2006. Available from <https://www.ismp-canada.org/download/ISMPCanadaListOfDangerousAbbreviations.pdf>

Institute for Safe Medication Practices Canada. ISMP Canada Safety Bulletin. 25 February 2021; 21 (2). Available from <https://ismpcanada.ca/bulletin/preventing-errors-with-covid-19-vaccines-learning-from-vaccine-incidents/>

Institute for Safe Medication Practices Canada. ISMP Canada Safety Bulletin. 26 August 2021; 21(8). Available from <https://ismpcanada.ca/bulletin/updated-analysis-and-shared-learning-from-covid-19-vaccine-errors/>

Institute for Safe Medication Practices. Additional risk of age-related mix-ups now that our youngest patients are eligible for COVID-19 vaccines. 30 June 2022. Available from <https://www.ismp.org/resources/additional-risk-age-related-mix-ups-now-our-youngest-patients-are-eligible-covid-19>

Public Health Agency of Canada. Planning guidance for immunization clinics for COVID-19 vaccines: Managing vaccine administration errors or deviations. 07 July 2023. Available from <https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/guidance-documents/quick-reference-guide-covid-19-vaccines/managing-administration-errors-deviations.html>