Ministry of Health

Imvamune® Vaccine Storage and Handling Guidance

Version 3.3 – June 26, 2024

Highlights of Changes:

- Change in vaccine distributor from UHN to McKesson
- Removal of expired lot number P00021

This guidance provides basic information only. This document is not intended to provide or take the place of medical advice, diagnosis, treatment, or legal advice.

The intended audience for this guidance document is public health units that are:

- Storing, distributing and/or administering Imvamune®;
- Involved in the assessment of temperature excursions, including the vaccine return process;
- Providing education for the storage and handling of ultra-low temperature (ULT) and frozen vaccines and the use of temperature monitoring devices, such as data loggers.

Vaccines are sensitive biological substances that can lose their potency and effectiveness if they are exposed to temperatures (heat and/or cold) outside of the required temperature range for the specific product (i.e., ultra-low or frozen temperatures) or when exposed to light.

Failure to adhere to vaccine handling and cold chain requirements may reduce vaccine potency and/or increase local reactions at the site of the vaccine administration.

The loss of vaccine effectiveness due to cold chain exposures to adverse conditions is cumulative, permanent, and irreversible.

Public health units, health care providers and organizations (e.g., clinics) should also follow the:

- Ontario Vaccine Storage Handling Guidelines;
- Imavamune® Product Monograph

In addition, health care providers and organizations who have questions should contact their local public health unit.

Vaccine Storage Conditions

Imvamune® should only be stored frozen at the following temperatures:

- -20°C ± 5°C (-25°C to –15°C)
    - Imvamune® storage conditions and shelf life have been updated to reflect that Imvamune® vials can be stored at -20°C ±5°C for up to 91 days cumulative. However, by the time the vaccine reaches the PHU approximately 85 days will remain for vials stored between -25°C to –15°C. See guidance below.
- -50°C ± 10°C (-60°C to –40°C)
    - None of the below lots are compatible with this storage condition. Do not store between -60°C to –40°C.
- -80°C ± 10°C (-90°C to –70°C)

Table 1. Vaccine Storage Conditions Based on Lot Number.

Lot Number	Product Manufacturing Date	Expiry Date if stored between -90°C to –70°C	Expiry Date if stored between -25°C to –15°C
P00034	21-Sep-2016	30-Sep-2025	85 days from when the vaccine was placed in -25°C to –15°C. .
P00035	22-Sep-2016	30-Sep-2025	85 days from when the vaccine was placed in -25°C to –15°C.
P00036	23-Sep-2016	30-Sep-2025	85 days from when the vaccine was placed in -25°C to –15°C.
P00037	24-Feb-2017	28-Feb-2026	85 days from when the vaccine was placed in - 25°C to –15°C.

*__Note__: Imvamune® storage conditions and shelf life have been updated to reflect that Imvamune® vials can be stored at -20°C ±5°C for up to 91 days cumulative. However, by the time the vaccine reaches the PHU approximately 85 days will remain for vials stored between -25°C to –15°C. If the vaccine is stored at ULT (-80°C± 10°C (-90°C to –70°C) on arrival to PHU, vaccine can be used until expiry as listed in table above.

After prior storage at –20°C or -80°C (if within the approved respective shelf-life), vials of Imvamune® are approved for storage at +2°C to +8°C for up to 8 weeks from the time of thawing as long as the product is not expired. The product should be kept in the original packaging and protected from light.

Vaccine Transport

To support operational flexibility, Imvamune® may be shipped either frozen at - 20°C ± 5°C or in refrigerated temperatures at +2°C to +8°C, depending on freezer capacity at the receiving site(s) and shipping capabilities.

If the vaccine is shipped frozen at -20°C ± 5°C and requires storage before use, maintain:

- Frozen (-80°C ± 10°C) if freezer capacity is available; or
- Frozen (-20°C ± 5°C) if freezer capacity is available; or
- Refrigerated (+2°C to +8° C). Do not refreeze.

If the vaccine is shipped at +2°C to +8°C and requires storage before use, maintain:

- Refrigerated at +2°C to +8°C. Do not refreeze.

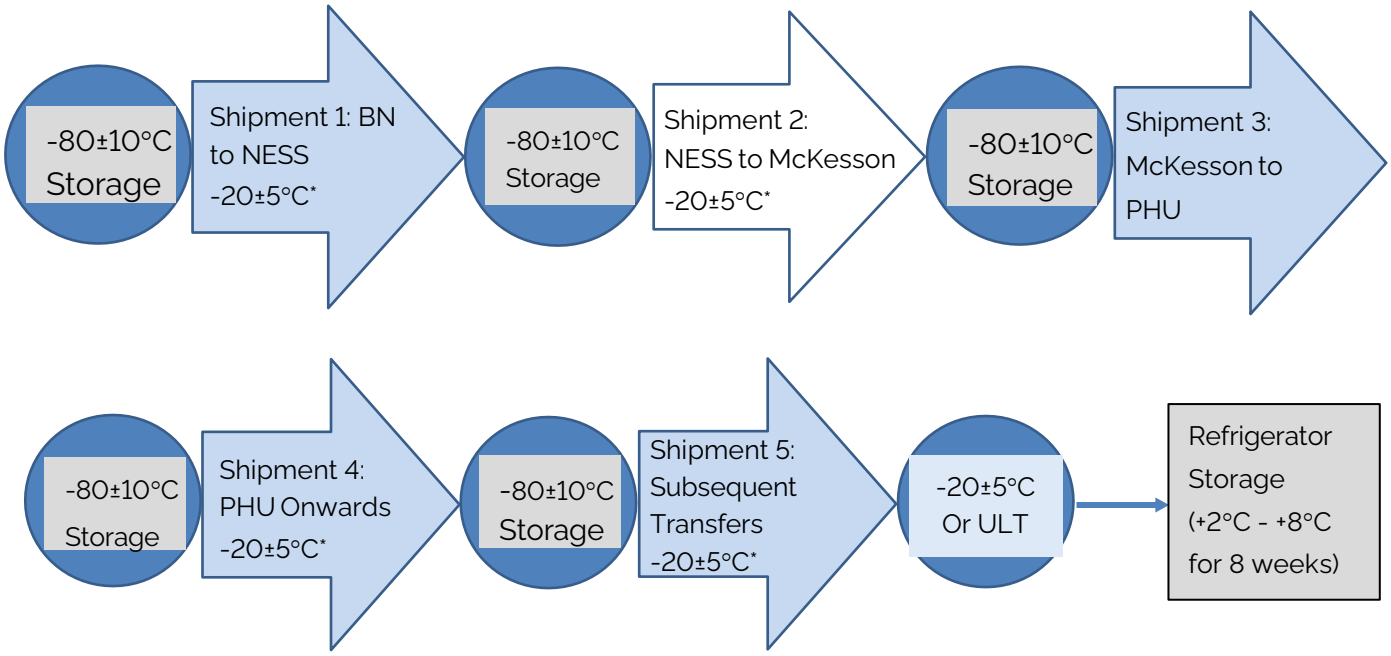
On August 6, 2022, Bavarian Nordic stated that although repeated transitions of Imvamune® between temperatures should be generally avoided, Imvamune® may undergo up to five cycles of shipment at -20°C ± 5°C and storage at -80°C ± 10°C which should not impact the product stability. At this time, the product monograph does not provide additional information on shelf life if the vaccine is moved between different storage temperatures. While Imvamune® has been shown to be stable at -80°C ± 10°C; there is currently no shipping data available to support the shipment of vaccine at this lower temperature.

Shipping Cycles

In general, it's recommended to avoid repeated transitions of the drug product between different temperatures. However, available stability data suggests that up to 5 cycles of shipment at -20°C ± 5°C and storage at -80°C±10°C should not impact the product quality.

Vaccine is shipped from the manufacturer, Bavarian Nordic (BN), to the National Emergency Strategic Stockpile (NESS). From there the vaccine is shipped to McKesson (MK). MK then ships the vaccine to the PHU in -20°C ± 5°C. This means that the PHU has 2 more shipping cycles available for product stability.

Figure 1. Depicts up to five cycles of shipment for Imvamune®. Shipment from the manufacturer to the NESS in Canada is considered the first shipment.



Note: Cumulative time of all shipment or storage at -20°C±5°C must be less than 3 months (91 days). 5 shipping cycles are allowable at -20°C±5°C.

- A shipping cycle is anything longer than 60 minutes. If shipping is less than 60 minutes, it is not considered a shipping cycle.
- PHUs will have 2 remaining shipment cycles.
- Temperature during shipment of vaccine should remain within -20°C ± 5°C.
- If vaccine is shipped at refrigerated temperatures, it is considered thawed and should not be re-frozen. The eight-week storage condition would now apply.

Vaccine Storage and Transport Scenarios for PHUs

Scenario 1: **Vaccine is shipped from MK to the PHU and stored at the PHU at -20°C ±5°C**

If stored at 20°C ±5°C, the vaccine will now expire 85 days from the day vaccine was received by the PHU. The 85 days accounts for any previous shipment of the vaccine which counts towards the 3-month (91 days) shipment allowance in the -20°C ±5°C range.

Scenario 2: Vaccine is shipped to PHU at -20°C ±5°C, and the vaccine is then stored at -80°C ± 10°C.

In this scenario the expiry date would be as listed on the vial. See Table 1.

Scenario 3: Vaccine is thawed but not punctured (sealed).

In this scenario, the vaccine may be stored between +2°C to +8°C for up to 8 weeks as long as the product is not expired.

Scenario 4: Vaccine is shipped multiple times at -20°C ± 5°C and then stored at -80°C ± 10°C.

In this scenario review the allowable shipment cycles used and available shipment cycles remaining to determine vaccine storage and handling conditions.

Scenario 5: The vaccine is inadvertently stored at -60°C to –40°C.

In this scenario contact Bavarian Nordic for a vaccine assessment at: medical.information_us@bavarian-nordic.com

Scenario 6: The PHU ships the vaccine to an injection site at -20°C ± 5°C and shipping takes longer than 60 minutes.

If shipping takes less than 60 minutes this does not count as a shipping cycle.

If shipping takes more than 60 minutes but less than 24 hours, the vaccine has undergone a shipping cycle. Mark the vaccine appropriately with remaining shipping cycles available and the updated expiry date.

Thawing

The product should be thawed at room temperature. Once thawed:

1. The vaccine should be used immediately, or
2. The vaccine can be stored between +2°C to +8°C for up to 8 weeks prior to use.
   - If taken from -80°C ± 5°C, thawing takes approximately 10 minutes.
   - If taken from -20°C, thawing takes approximately less than 10 minutes.

To ensure homogeneity upon thawing, the vial should be swirled gently (not shaken) for at least 30 seconds. After thawing, the vaccine should appear a pale milky coloured homogeneous suspension. The liquid vaccine should be visually inspected for any foreign particulate matter prior to administration. In case of foreign particulate matter being visible, the vaccine must not be used.

- Do not re-freeze a vial once it has been thawed/moved to fridge +2°C to +8°C.
- Store in original packaging to protect it from light.

Particulates

If particulates are found in vials of any lot number email the vaccine policy and programs branch at vaccinesupplyandlogistics@ontario.ca for a vaccine assessment. Quarantine the vials until an assessment has been made.

Receipt of Vaccine

When receiving the vaccine, the receiving site should:

- Designate one person as the lead for the facility who will be an authorized receiver of the vaccine delivery. This individual should ensure that standard operating policies and procedures related to vaccine storage and handling are in place and are followed.
- Designate and train alternate(s) to be responsible for the above if the lead is not available. The alternate(s) should be trained in routine and emergency policies and procedures related to vaccine storage and handling.
- Ensure that responsible staff are adequately trained and have knowledge of the requirements for vaccine storage and handling, product sensitivities, storage equipment, temperature monitoring devices, and inventory management procedures.
- Use the Vaccine Storage Handling Guidelines, 2018 (or as current) to educate and instruct health care providers who store publicly funded vaccines.

- Ensure that designated and trained staff or their alternate(s):
    - Are available to receive and store vaccines when they are expected to arrive.
    - Never leave vaccines in a shipping container, unpacked or unattended.
    - Understand that vaccine deliveries require immediate attention.
- Immediately open all the transport containers and assess the digital temperature monitoring device(s).
    - Products should be quarantined until all necessary steps to confirm successful transport are complete (e.g., temperature during transport, condition of product received).
- Examine the shipment for evidence of damage. Quarantine the product immediately if damaged.
- The staff person who received the vaccine is responsible for:
    - Documenting their name, the date and time of receipt of the vaccines and sign the manifest to acknowledge the receipt of the vaccines.
    - Unpacking the shipment and placing the vaccines immediately in the appropriate storage unit.
    - Reviewing the order against the packing slip(s) to confirm that the order is correct.
    - Receiving and recording the vaccines into inventory for use (i.e., remove from quarantine) if the digital temperature monitoring device(s) indicates that the cold chain was maintained during shipping.
    - In the event of a temperature excursion, public health unit should initiate their investigation/assessment.
    - Documenting the vaccine expiry date based on storage condition
- Check vaccine expiry dates regularly and after every vaccine order.
    - Move vaccines with shorter expiry dates to the front of the storage unit so that they can be used first.
    - Check expiry dates before vaccines are used.
    - Remove expired vaccines and dispose of them appropriately.

The packing slip will indicate the vaccine storage temperature and expiry date.

Temperature Excursions

If vaccine is not being stored at the public health unit, the site should contact their local public health unit to report the excursion through normal process. Public health units should have an established process in place to manage temperature excursions after hours and on weekends to ensure that vaccine is not held in quarantine for an extended period.

Email or fax the public health unit the following:

- The date, time, temperatures (maximum, minimum and current temperature) and the details on the excursion (e.g., length of time); and
- Attach the PDF file (if applicable).

The public health unit should contact the manufacture Bavarian-Nordic at medical.information_us@bavarian-nordic.com for vaccine assessment. The PHU may also email vaccinesupplyandlogistics@ontario.ca for consultation. Once an assessment has been made by the manufacturer, notify the ministry.

There is no data available on the storage of the product in a syringe prior to use; as such, it's recommended for the product to remain in the original glass vial until immediately before use.

It's also not recommended to remove individual vials from a package in a frozen state to store in the refrigerator unless you can do so in a manner where the rest of the package remains frozen.

Transport and Packing

Given the 8-week shelf-life of the vaccine at +2°C to +8°C, recommended shipping is at one of the frozen storage temperatures. If not possible or planned for specific clinic use, the vaccine can be transported at +2°C to +8°C.

For further information on how to pre-condition and pack an insulated container, see Appendix A in the COVID-19 Vaccine Storage and Handling Guidance.

The manufacturer has not provided any syringe stability information. Vaccines should be transported in their original vials, unopened, in any of the approved storage temperatures.

Vaccine Vial Disposal

- Vials, either empty or with vaccine remaining, should be disposed of per regulation and guidelines by the Ministry of the Environment and Climate Change:
    - Environmental Protection Act, R.S.O. 1990, c. E.19, Regulation 347
    - C-4: The Management Of Biomedical Waste In Ontario
    - Registration Guidance Manual for Generators of Liquid Industrial and Hazardous Waste

Additional Resources

Bavarian Nordic – Imvamune Product Monograph

European Centre for Disease Prevention and Control - Factsheet for health professionals on mpox (monkeypox)

Ontario Ministry of Health - Mpox (monkeypox)

Ontario Ministry of Health - Mpox (monkeypox) resources for health care professionals

Ontario Ministry of Health - Recommendations for the management of cases and contacts of mpox in Ontario

Public Health Agency of Canada - Mpox (monkeypox)

Public Health Ontario – Mpox (formerly known as monkeypox)

United States Centers for Disease Control - Mpox

World Health Organization – Mpox (monkeypox) Key Facts

World Health Organization - Mpox (monkeypox) Questions and Answers