Vaccine storage guidelines: Keeping it cold 2013-2016
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### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>°C</td>
<td>Degrees Celsius</td>
</tr>
<tr>
<td>AEFI</td>
<td>Adverse Event Following Immunisation</td>
</tr>
<tr>
<td>BCG</td>
<td>Bacillus calmette-guérin</td>
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<tr>
<td>CCA</td>
<td>Cold Chain Accreditation</td>
</tr>
<tr>
<td>CHS</td>
<td>Central Health Service</td>
</tr>
<tr>
<td>DTP-HepB-Hib</td>
<td>Diphtheria, tetanus, pertussis, hepatitis b, hib Vaccine</td>
</tr>
<tr>
<td>EHS</td>
<td>Eastern Health Service</td>
</tr>
<tr>
<td>EPI</td>
<td>Expanded Program on Immunisation</td>
</tr>
<tr>
<td>FPBS</td>
<td>Fiji Pharmaceutical and biomedical Services</td>
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<tr>
<td>HBV</td>
<td>Hepatitis B Vaccine</td>
</tr>
<tr>
<td>MR</td>
<td>Measles Rubella Vaccine</td>
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<tr>
<td>NHS</td>
<td>Northern Health Service</td>
</tr>
<tr>
<td>OPV</td>
<td>Oral Polio Vaccine</td>
</tr>
<tr>
<td>TT</td>
<td>Tetanus Toxoid Vaccine</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations Childrens Fund</td>
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<tr>
<td>VM</td>
<td>Vaccine Vial Monitor</td>
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<tr>
<td>WHS</td>
<td>Western Health Service</td>
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</table>
1. Our vaccine management profile

1.1 Our people

Our Goal
In our health centre/nursing station, staff members are responsible for these activities: Recording the temperature in the morning:
- Recording the temperature in the evening
- Ordering vaccines
- Receiving vaccines
- Checking vaccine expiry dates and rotating stock

All new staff members who are involved in some or all elements of vaccine management and/or the cold chain must complete the 3 day Basic EPI Training when they start to ensure that they understand how to manage their vaccines and a cold chain.

All key staff members also receive regular updates on immunisation and vaccine management via attendance at education sessions, newsletter articles or supervisory visits and other methods of support offered Sub Division, Divisional and National levels.

Our Goal
It is essential that the health centre or nursing station establish simple, routine cold chain processes and systems for their particular immunisation service that are easily maintained. The health centre or nursing station should abide by the National EPI Policy 2013-2016 and Vaccine Storage Guidelines: Keeping it cold 2013-2016.

Vaccine Management starts from knowing your cold chain. This involves knowing which type of cold chain equipment to use, its capacity or volume and vaccines to order. It is important to maintain an effective cold chain system from the manufacturer to the administration so that the potency and safety of vaccine is maintained.

In our health centre or nursing station, we have implemented the following protocols to safely and effectively manage our vaccines:
1. About cold chain and why it is important.
2. Key staff members responsible for vaccine management.
3. Vaccine refrigerator and monitoring equipment.
4. Ordering of vaccines.
5. Receiving vaccines.
7. Loading the vaccine refrigerator.
8. Loading a vaccine carrier.
9. Loading a cold box.
10. Daily monitoring and recording of the vaccine refrigerator temperature.
11. Managing a power failure.
12. Action in the event of a cold chain breach.
14. Maintenance of the vaccine refrigerator and monitoring equipment.

1.2 Our vaccine refrigerator

Our Goal
In our health centre or nursing station, we use the following dedicated refrigerator to store vaccines:
- Ice Lined Refrigerator-
  o MK 074 (electric)
  o MK 304 (electric)
  o HBC 200 (electric)
  o MF 214 (electric)
  o MK 204 (electric)
  o MKS 044 (solar)
- RCW 50 EG (gas or electric)
- Domestic Refrigerators (electric)

1.3 Our monitoring equipment

Our Goal
In our health centre or nursing station, we use the following equipment to monitor the temperature of our vaccine refrigerator:
- Stem Thermometers
- Bar Thermometers-only dial
- Freeze Tags
- Refrigerator Monitoring Chart
- Data Loggers (National level only)
- Vaccine Vial Monitors (VVM)

We record the temperature of our vaccine refrigerator using the practice listed under Checking and recording the vaccine refrigerator temperature in this document.
We maintain our equipment using the practice listed under equipment maintaining our monitoring in this document.
2. Ordering, receiving and disposal of vaccines

2.1 Ordering vaccines

Our Goal
At our health centre or nursing station, we keep vaccine stock to a minimum by regularly monitoring the vaccines stored in the vaccine refrigerator.

We order our vaccines through FPBS on a monthly basis using the practice listed below. Vaccine orders are received by National EPI Coordinator by the 15th day of each month.

Our Practice
In our health centre or nursing station, we follow this practice for ordering vaccines:
1. Order from the FPBS via phone: 338 8888 or fax: 3388003/3388012
2. Orders must be placed monthly by the 15th of each month.
3. When ordering, the Vaccine Order Form must be fully completed and include all information such as
   - Quantity received each month
   - Stock Balance at the end of the month
   - Vaccine doses discarded due to VVM change or for other reasons
   - Temperature at which vaccines were exposed
   - AEFI
   - Target population
4. FPBS will deliver vaccines to Sub Divisional Health Centres by:
   a. WHS - Last week of the month
   b. NHS - 3rd week of the month
   c. CHS - 3rd week of the month
   d. EHS - varies according to boat and flight schedules

NOTE: Delays in delivery may occur because of remoteness, weekends, public holidays and adverse weather conditions.

2.2 Receiving vaccines

Our Practice
In our health centre or nursing station, we follow this practice for receiving vaccines:
1. Vaccines must only be received by nursing staff that have completed the 3 day Basic EPI Training Course or have completed on-the-job training on Cold Chain and Vaccine Management during their induction prior to their transfers.
2. When receiving stock, the following practice is to be followed and the following information be checked and recorded against receiving document:
   - Vaccines: quantity in doses, manufacturer, number of vials, batch number, expiry date, VVM status and freeze tag status accompanying the stock package/delivered.
   - Diluents: quantity in doses, type of diluents, manufacturer comparing with its dried vaccines batch numbers and expiry date of each batch or lot.
   - Droppers: quantity, type of droppers e.g. 10 doses, manufacturer and batch or lot number.
   - Other consumables in the ‘vaccine bundle’: quantities of AD Syringe, needles for the pneumococcal and HPV vaccines, safety boxes.
3. When vaccines are received the shipment must be checked immediately for
   - Exposure to heat or freezing
   - Stock that was ordered was received
   - Damage to vials
   - Expiry date
4. Transfer vaccines to the refrigerator immediately, minimising the time that the refrigerator door is open. Fresh vaccines should be placed to the rear of the current stock if the expiry dates are longer than the current stock.
5. If you have any concerns about your vaccine delivery, isolate the vaccines in the vaccine refrigerator and contact the National EPI Coordinator as soon as possible after receiving your delivery.
2.3 Disposal of vaccines

Our Goal
Vaccine should only be discarded on advice from The EPI Coordinator. Discarding vaccine may be as a result of expiration or cold chain breach.

Our practice
In our health centre or nursing station, we follow this practice if there is a cold chain breach:
1. Count the number of vials of each type of damaged vaccines.
2. Record in the Vaccine Stock Book of each type of vaccine damaged
3. Subtract damaged vials from current stock
4. Fill in the Loss/Adjustment Waste Vaccine Form stating:
   • Type of vaccines
   • Number
   • Batch number.
   • Expiry date
   • Reason(s) for damage
5. Report to as above National EPI Coordinator as soon as possible
6. Send Form to the National EPI Co-ordinator
7. Place new order of vaccines if needed
3. Loading our vaccine refrigerator

3.1 Principles for loading our vaccine refrigerator

Our Goal
Correct loading of our vaccine refrigerator is essential if vaccines are to remain safe and effective. The vaccine refrigerator needs to have capacity to accommodate the maximum vaccine storage needs including during supplementary immunisation activities.

Additional note for domestic refrigerators:
Domestic refrigerators are designed for food storage and not the specialised needs of vaccines therefore modification of domestic refrigerators is necessary to reduce the risk of adverse storage events. Frost-free refrigerators are suitable following modification, however cyclic defrost and bar refrigerators are not recommended.

Careful monitoring and knowledge of our refrigerator is essential to minimise risk to the vaccine, so it is important that we know our vaccine refrigerator by monitoring and recording temperatures throughout and pack the refrigerator accordingly. Please follow the instructions below for how to load your vaccine refrigerator.

Vaccine loading or storing in the refrigerator and vaccine carrier will be based on the sensitivity of the vaccines to; heat, light, and freezing which can destroy the vaccines.

3.2 Loading an Ice lined refrigerator

Our Practice
In our health centre or nursing station, we follow these principles when loading our ice lined vaccine refrigerator see figure 3:

1. All vaccines should be stored in the baskets provided with the refrigerator
   a. MR, BCG and OPV vaccines should be stored on the bottom only; and
   b. DTP-HepB-Hib, TT HBV, Pneumococcal, Rotavirus and HPV Vaccines in the baskets on the top.
   c. Diluents must also be stored in the vaccine refrigerator.

d. Ensure there is space between the vaccine boxes for air to circulate.
e. Opened vials of OPV, TT and HBV (10 dose vial) must be labelled with the date and time opened and stored in the ‘use first’ box for first use during the next session provided expiry date has not passed.
f. Keep vials of vaccine with VVM’s showing more heat exposure in the box labelled ‘use first’ for use at the next immunisation session provided expiry date has not passed.
g. Do not over stock a vaccine refrigerator.
h. Place a warning sticker above the refrigerator power source stating “DO NOT TURN POWER OFF.” If the power source is exposed, a switch cover may be necessary.

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d. Ensure there is space between the vaccine boxes for air to circulate.

e. Opened vials of OPV, TT and HBV (10 dose vials) must be labelled with the date and time opened and stored in the ‘use first’ box for first use during the next session.

f. Keep vials of vaccine with VM’s showing more heat exposure in the box labelled ‘use first’ for use at the next immunisation session.

g. Do not overstock a vaccine refrigerator.

h. Place a warning sticker above the refrigerator power source stating “DO NOT TURN POWER OFF”. If the power source is exposed, a switch cover may be necessary.

3.3 Loading an RCW 50 refrigerator

Our Practice

In our health centre or nursing station, we follow these principles when loading our RCW 50 vaccine refrigerator see figure 5:

a. MR, BCG and OPV vaccines should be stored near the Freezer section;

b. DTP-HepB-Hib, TT, HBV, pneumococcal, rotavirus, HPV vaccines and diluents in the cooling section;

c. Ensure there is space between the vaccine boxes for air to circulate.

d. Opened vials of OPV, TT and HBV (10 dose vials) must be labelled with the date and time opened and stored in the ‘use first’ box for first use during the next session provided expiry date not passed.

e. Keep vials of vaccine with VM’s showing more heat exposure in the box labelled ‘use first’ for use at the next immunisation session provided the expiry date is not passed.

f. Do not overstock your vaccine refrigerator.

g. Place a warning sticker above the refrigerator power source stating “DO NOT TURN POWER OFF”/“DO NOT SWITCH OR REMOVE GAS CYLINDER”. If the power source is exposed, a switch cover may be necessary.
4. Checking and recording the vaccine refrigerator temperature

4.1 Principles of monitoring our vaccine refrigerator

Our Goal
Checking and recording the minimum and maximum temperature of the vaccine refrigerator is an essential element of ensuring that vaccines remain safe and effective. Checking and recording temperatures before using vaccine enables the identification of problems before vaccine (which may be damaged) is given. Most vaccines procured in Fiji will have a VVM that will indicate cumulative exposure to heat to that vaccine vial.

Twice daily checks give a better indication of any problems in the refrigerator’s function and temperature fluctuations over the course of the day. However, the temperature needs to be viewed and considered every time the refrigerator is opened.

Our Practice
In addition to twice daily monitoring and recording the temperature of the vaccine refrigerator, our health centre or nursing station ensures safe and effective vaccines by completing the following:
1. Check minimum/maximum temperatures and VVM on vaccines: on receipt of vaccines, every day before clinic commences and at the end of the working day, twice a day even on weekends and public holidays.
2. Record temperature, comments and any action taken including if minimum and maximum temperature ranges are exceeded the recommended range of +2°C and +8°C, e.g. if restocking or defrosting the refrigerator.
3. Record all temperatures on the Refrigerator Monitoring Chart see annex 1.

Knowledge and responsibilities:
Responsible staff should know that the safe operating temperature for vaccine refrigerators is between +2°C to +8°C and that the safe operating temperature for freezer rooms and vaccine freezers is between -15°C to -25°C. They should know how to read a dial thermometer or stem thermometer accurately.

Responsible staff should know how to complete a temperature monitoring record chart. These are acceptable provided the identity of the person recording the temperature is noted and provided there is a space on the chart for recording notes. It is essential that this process is not purely mechanical. Staff must be made responsible for their actions and trained to react effectively to problems as soon as they arise.
5. Management of cold chain problems

5.1 Planning and prevention

Our Goal
Cold chain problems can take many shapes and forms such as inadequate equipment and processes, incorrect packing of the vaccine refrigerator, staff involved in vaccine management not provided with training, vaccine accidentally left out of the refrigerator, refrigerator accidentally turned off or unplugged, power failure, and natural disasters including cyclones and floods. All of these events can lead to a cold chain breach.

Our Practice
1. In our health centre or nursing station, we have put the following measures in place to prevent wherever possible a cold chain breach:
   a. Simple, routine processes established.
   b. Written protocols developed on safe and effective vaccine management.
   c. Staff involved in vaccine management have received training in vaccine management and understand the cold chain and its importance.
   d. Appropriate vaccine refrigerator and monitoring equipment are utilised.
   e. Processes are in place for ordering and receiving vaccines.
   f. Processes are in place for safe disposal of vaccines.
   g. The vaccine refrigerator is packed in accordance with Vaccine Storage Guidelines: Keeping it cold 2013-2016.
   h. The temperature of vaccines are monitored and recorded in accordance Vaccine Storage Guidelines: Keeping it Cold 2013-2016.
   i. Processes in place for managing a power failure, or adverse weather conditions.
   j. Equipment and process in place for packing a cold box.
   k. Processes in place for maintenance of the vaccine refrigerator and monitoring equipment.
   l. Conduct a vaccine management audit on an annual basis.
   m. Conduct cold chain risk management planning.
   n. Conduct quality review processes in the event that a cold chain problem occurs.

We also have processes in place to appropriately manage a cold chain breach. For further information, refer to chapter 2: Ordering, Receiving and disposing of vaccines.

5.2 Managing a power failure for a vaccine refrigerator

Our Goal
Some vaccine refrigerators are designed to hold their temperature for a while if there is a power failure. Vaccine providers should know the brand of refrigerator they have in their clinic (see annex 2 How to identify what type of vaccine refrigerator you have).

Table 1 below will tell you how long the temperature will be maintained or hold over time if the vaccine refrigerator is not opened during a power failure.

Vaccine service providers must know how long the vaccine refrigerator in their clinic will hold a temperature of +2°C and +8°C in the event of a power failure.

<table>
<thead>
<tr>
<th>Refrigerator Type</th>
<th>Length of Time +2°C to +8°C can be maintained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ice lined (HBC200 MK 304</td>
<td>30 hours</td>
</tr>
<tr>
<td>MK 074 MK 204</td>
<td></td>
</tr>
<tr>
<td>RCW 50 EG</td>
<td>24 hours</td>
</tr>
<tr>
<td>Domestic</td>
<td>2 hours</td>
</tr>
<tr>
<td>MKS 044 Solar Fridge</td>
<td>5 days</td>
</tr>
</tbody>
</table>

Table 1 Length of time a refrigerator can maintain +2°C to +8°C during a power failure

5.3 Managing a power failure in a domestic refrigerator

Our Practice
In our health centre or nursing station, we follow this practice in the event of a power failure during business hours:

Investigate the reason for the power failure:
1. If it is a power cut, phone the FEA to ascertain approximately how long the power will be interrupted.
2. Monitor the temperature of the refrigerator every 2 hours.
3. During a power failure of 2 hours or less, the refrigerator door should be kept closed.
4. For power failures of more than 2 hours, or if the refrigerator temperature reaches 10°C, transfer the vaccines to a cold box.
5. Always have an alternative means of vaccine storage available such as cold box and frozen ice packs.
6. If the vaccines are transferred to a cold box. Continue to monitor the temperature of the vaccines by placing the thermometer inside a cold box. It is recommended that monitoring occurs every 15 minutes for the first 2 hours as freezing is most likely to occur during this period. Following the 2 hour period, monitor the cold box every hour. For further information, refer to Packing a cold box chapter 8.
7. When the power supply is restored check the VVM’s on the vials. If any of the VVM’s has reach stage 2 (see annex 3 for identification of the stages) put these vials in the use first tray.
8. Vaccine that have reached stage 3 or higher need to be discarded, follow the Disposal of Vaccines under chapter 4.

IMPORTANT: Depending on the circumstances of a power failure, ice packs may not be given adequate conditioning time prior to packing a cold box. In these instances, use additional insulating material to protect the vaccine and monitor the cold box closely.

5.4 Managing a power failure in an ice lined refrigerator

Our Practice
In our health centre or nursing station, we follow this practice in the event of a power failure during business hours:
Investigate the reason for the power failure:
1. If it is a power cut, phone the FEA to ascertain approximately how long the power will be interrupted.
2. Frequently monitor the temperature of the refrigerator.
3. During a power failure of 40 hours or less, the refrigerator door should be kept closed.
4. For power failures of more than 40 hours, or if the refrigerator temperature reaches 10°C, transfer the vaccines to a cold box.
5. Always have an alternative means of vaccine storage available such as vaccine carrier or cold box and frozen ice packs.
6. If the vaccines are transferred to a cold box, continue to monitor the temperature of the vaccines by placing the thermometer inside a cold box. It is recommended that monitoring occurs every 15 minutes for the first 2 hours as freezing is most likely to occur during this period.

Following the 2 hour period, monitor the box every hour. For further information, refer to Packing a cold box chapter 8.
7. When the power supply is restored check the VVM’s on the vials. If any of the VVM’s has reach stage 2 (see annex 3 for identification of the stages) put these vials in the use first tray.
8. Vaccine that have reached stage 3 or higher need to be discarded, follow the Disposal of Vaccines under chapter 4.

IMPORTANT: Depending on the circumstances of a power failure, ice packs may not be given adequate conditioning time prior to packing a cold box. In these instances, use additional insulating material to protect the vaccine and monitor the cold box closely.

5.5 Managing a power failure or interruption to gas supply in a RCW 50 refrigerator

Our Practice
In our health centre or nursing station, we follow this practice in the event of a power failure during business hours:
Investigate the reason for the power failure:
1. If it is a power cut, phone the FEA to ascertain approximately how long the power will be interrupted.
2. Frequently monitor the temperature of the refrigerator.
3. During a power failure of 6 hours or less, the refrigerator door should be kept closed.
4. For power failures of more than 6 hours, or if the refrigerator temperature reaches 10°C, switch refrigerator over to gas mode or transfer the vaccines to a cold box.
5. Always have an alternative means of vaccine storage available such as vaccine carrier or cold box and frozen ice packs.
6. If the vaccines are transferred to a cold box, continue to monitor the temperature of the vaccines by placing the thermometer inside a cold box. It is recommended that monitoring occurs every 15 minutes for the first 2 hours as freezing is most likely to occur during this period.

Following the 2 hour period, monitor the box every hour. For further information, refer to Packing a cold box chapter 8.
7. When the power supply is restored check the VVM’s on the vials. If any of the VVM’s has reach stage 2 (see annex 3 for identification of the stages) put these vials in the use first tray.
8. Vaccine that have reached stage 3 or higher need to be discarded, follow the Disposal of Vaccines under chapter 4.
annex 5 for identification of the stages) put these vials in the use first tray.

8. Vaccine that have reached stage 3 or higher need to be discarded, follow the Disposal of Vaccines under chapter 4.

IMPORTANT: Depending on the circumstances of a power failure, ice packs may not be given adequate conditioning time prior to packing a cold box. In these instances, use additional insulating material to protect the vaccine and monitor the cold box closely.

5.6 Action in the event of a cold chain breach

Our Goal
A cold chain breach is when vaccine storage temperatures have been outside the recommended range of +2°C and +8°C. This does not however include temperature increases up to +12°C lasting no longer than 15 minutes when stocktaking or restocking.

Cold chain breaches can occur for many reasons:
- Vaccine refrigerator door left opened for a long time
- Natural Disaster including floods and cyclones
- Unknown Interruption to electricity or gas supply

Cold chain breaches left unidentified and untreated can have serious and costly implications especially when it involves informing people that they or their child may have received an ineffective vaccine and will require revaccination.

Our Practice
In our clinic, we follow this practice in the event of a cold chain breach:

1. Assess the VVM of all vaccines. If the VVM is stage 2 or less they can continue to be utilised. If the VVM is stage 3 or more they must be removed from the vaccine refrigerator and discarded.

2. Keep vaccines refrigerated between +2°C and +8°C in a different refrigerator or cold box.

3. Contact the National Immunisation Coordinator ph 338 8000 during business hours as soon as possible to inform them of the breach and to seek advice.

4. Have important details on hand including:
   a. the name of the health centre or nursing station,
   b. date of the breach,
   c. the minimum and maximum temperature reading,
   d. when the thermometer was last checked,
   e. how long you think the temperature was outside +2°C and +8°C, and
   f. what you think was the cause of the cold chain breach.

5. Do not discard any vaccine unless advised by the National Immunisation Coordinator.

6. Take active steps to correct the problem and prevent the problem from recurring.

7. Record notes on the temperature log or chart regarding what happened and how the problem was corrected.
6. About vaccine carriers and old boxes

**Our Goal**
A vaccine carrier is a solid-walled insulated container that has a tight fitting lid and a foam pad with a thermometer measuring the temperature inside maintained by ice packs. A cold box is a solid-walled insulated container that has a tight fitting lid with a thermometer measuring the temperature inside maintained by ice packs.

Although generally associated with outreach immunisation clinics, health centres or nursing stations will generally need a vaccine carrier or cold boxes in the following circumstances:

a) Transport of vaccines.
b) Defrosting a domestic vaccine refrigerator.
c) During a power failure.
d) Vaccine refrigerator breakdown.
e) Vaccine refrigerator not maintaining the correct temperatures of between +2°C and +8°C.
f) Other circumstances requiring the health centre or nursing station to remove vaccines from the refrigerator (e.g. cyclone or flood).

It is important to note that freezing happens very easily in all vaccine carriers and cold boxes, usually in the first 2 hours after packing. A health centre or nursing station should therefore select a vaccine carrier or cold boxes that are large enough to store their vaccine as well as sufficient insulating material to ensure that the vaccine is protected. It is encouraged that health centres and nursing stations experiment with their vaccine carriers or cold boxes to maintain a stable temperature which includes knowing how many ice packs are required. The amount of time a vaccine carrier or cold boxes will maintain the temperature between +2°C and +8°C varies depending on the brand and outside ambient temperature, see annex 6.

**IMPORTANT:** In the event of a natural disaster such as a cyclone or depending on the circumstances of a power failure, ice packs may not be given adequate conditioning time prior to packing a vaccine carrier or cold box. In these instances, use additional insulating material to protect the vaccine and monitor the vaccine carrier closely.

**6.1 Monitoring a vaccine carrier**

**Our Practice**
In our health centre or nursing station, we check the temperature of the vaccine carrier or cold box:
1. after packing.
2. every 15 minutes for the first 2 hours, and then every hour following the 2 hour period (freezing is most likely to occur within the first 2 hours after packing).
3. regularly but at least hourly.
4. prior to administering vaccine, and
5. before returning vaccine to the vaccine refrigerator.

**6.2 Equipment for a vaccine carrier or cold box**

**Our Practice**
In our health centre or nursing station, we have the following equipment available to pack a vaccine carrier or cold box:
1. A UNICEF procured vaccine carrier or cold box (see annex 6 for types available in Fiji)
2. Ice packs that have been frozen for 24 hours (2 for the small yellow carriers and 4 for the larger carriers).
3. Foam pad with incisions for vials (for vaccine carriers only)
4. Insulating material such as cardboard, plastic bubble-wrap and/or shredded paper.
5. Minimum/maximum thermometer.

**NOTE:** health centres or nursing stations with a vaccine refrigerator will need to stock ice packs in the freezer of their domestic refrigerator, RCW 50 or Ice Lined refrigerator. It takes 24 hours to freeze an ice pack so ensure there is enough stock to rotate ice packs from day to day.

**6.3 Packing a vaccine carrier or cold box**

**Our Practice**
In our health centre or nursing station, we follow this practice to pack a vaccine carrier or cold box:
1. Condition the ice packs (see below)
2. Chill the inside of the vaccine carrier by placing the ice packs inside for ½ hour.
3. Place insulating material at the bottom of the container.
4. Place a thermometer to monitor the temperature inside the vaccine carrier.
5. Surround the vaccines with more insulating material.
6. Ensure vaccines are not in direct contact with the ice packs to minimise risk of freezing.
7. Place foam pad on top (vaccine carriers only).
8. Just prior to vaccination session starting place opened multi dose vials to use first in the incision in the foam pad to reduce number of times: the vaccine carrier is opened (vaccine carriers only).

6.4 Conditioning ice packs

Our Goal
Conditioning means leaving the ice packs at room temperature to allow the ice at the core to rise to about 0°C. This is also known as “sweating”. Ice packs must be conditioned correctly before use as the risk of freezing vaccines increases if the ice packs are not conditioned correctly. It is noted however that in the event of a natural disaster such as a cyclone or depending on the circumstances of the power failure; ice packs may not be given adequate conditioning time prior to packing a vaccine carrier. In these instances, use additional insulating material to protect the vaccine and monitor the vaccine carrier closely.

Our Practice
In health centre or nursing station, we follow this practice for conditioning ice packs:
1. Remove ice packs from the freezer.
2. Lay out in a single or two rows on their sides (where possible) with holes facing upwards.
3. Leave a 5cm space around each ice pack to allow maximum air exposure to reduce conditioning time.
4. Conditioning time depends on the ambient temperature, type of ice pack and size/weight of ice pack.
5. Ice-packs must be re-filled with water at the end of the month during cleaning.
7. Outreach immunisation clinic

Our Goal
An outreach immunisation clinic involves careful preparation and selecting the correct equipment to ensure that the cold chain is maintained. Correct equipment for storing and transporting vaccine is dependent on type of conditions (such as ambient temperature) and period of time they will be transported.

Portable vaccine carriers are adequate for the transport of vaccines for 4 hours or less however for longer periods of time and in extreme conditions, a cold box is recommended.

7.1 Preparing for an outreach immunisation clinic

Our Practice
In our health centre or nursing station, we follow this practice to prepare for an outreach immunisation clinic:

1. Choose an adequately sized vaccine carrier or cold box according to length of storage and transport time and type of conditions.
2. Ensure sufficient stock of vaccine and diluents are taken.
3. Ensure sufficient stock of ice packs according to:
   a. ambient temperature,
   b. type and size of cold box or vaccine carrier,
   c. number of vaccines,
   d. vaccine carrier or cold box capacity, and
   e. size and type of ice packs.
4. Condition the ice packs.
5. Pack the vaccine carrier according to cold chain requirements, immediately prior to leaving for the clinic.
6. Monitor the temperature of the vaccines and record in the outreach book prior to leaving the fixed site or Health Centre/Nursing Station before vaccination, during the session and upon return to the Health Centre/Nursing Station.
7. Ensure the contents of the vaccine carrier are packed securely so that they cannot move around during transportation.
8. Ensure the vaccine carrier is stored in the coolest section during transportation.
9. Closely monitor vaccine VVM status and that the temperature has been maintained before returning the unused vials to the refrigerator at the end of the session.

7.2 Monitoring the vaccine carrier during the outreach immunisation clinic

Our Practice
During an outreach immunisation clinic, check the temperature of the vaccine carrier:
1. before you leave,
2. every 15 minutes for the first 2 hours, and then every hour following the 2 hour period (freezing is most likely to occur within the first 2 hours after packing),
3. when you arrive,
4. prior to administering vaccine, and
5. regularly throughout the immunisation session (at least hourly).

7.3 Maintaining the cold chain at the outreach immunisation clinic

Our Practice
In our health centre or nursing station, we follow this practice to ensure the cold chain is maintained during an outreach clinic:

1. On arrival at the facility, place the vaccine carrier in the coolest place and out of the sun.
2. Keep vaccines in the vaccine carrier with the lid tightly closed until all other preparation for the clinic has been completed.
3. Vaccines should be stored in the slits in the foam pad.
4. Vaccines should only be drawn-up immediately prior to use.
5. For all day clinics carry a vaccine carrier that contains only ice packs and use these to replace those ice packs in contact with vaccines as they melt.

7.4 Returning to the Clinic after an outreach session

Our Practice

1. At completion of the outreach immunisation clinic, inspect all vials of vaccine
2. Discard any vials that have been opened (the multi dose vial policy does not apply to outreach session)
3. Discard any vials where the VVM has reached stage 3 or higher
4. Return all other vials to the ‘Use First’ box
5. Clean ice packs and return to the freezer, ensuring they will not be used again for 24 hours
6. Clean and dry vaccine carrier
8. Maintaining our equipment

Our Goal
A well maintained vaccine refrigerator and monitoring equipment is essential if vaccines are to remain safe and effective.

For vaccine refrigerators, it involves having a maintenance program in place, positioning the refrigerator in a suitable location and defrosting a domestic refrigerator. It also involves the reporting of any problems with your vaccine refrigerator in a timely manner to the National EPI Coordinator and completing the Work Order Form see annex 5.

8.1 Maintaining our vaccine refrigerator

Our Practice
In our health centre or nursing station, we maintain our vaccine refrigerator via the following ways:

1. Conduct a vaccine management supervisory visit (including people, processes and equipment) at least every quarter.
2. Report refrigerator problems immediately to the National EPI Coordinator so that repairs can be made.
3. Check the rubber seal around the door. If brittle or torn, arrange for replacement.
4. Defrosting and cleaning of a vaccine refrigerator should be conducted monthly (or whenever the ice build-up is greater than 5cm). Transfer the vaccines to a vaccine carrier and monitor the temperature.
5. Keep the back of the refrigerator clean and dust free to improve operating efficiency.
6. For gas vaccine refrigerators see annex 7 for additional maintenance needs;
   a. check for gas leaks (gas refrigerator only once a month).
   b. check the Flue and Baffle

8.2 Location of our vaccine refrigerator

Our Practice
In our health centre or nursing station, we have positioned our vaccine refrigerator according to these principles:

1. Place the vaccine refrigerator away from warm external walls and out of direct sunlight.
2. Ensure that the refrigerator is in a secure area only accessible to staff, whenever possible.
3. Ensure the vaccine refrigerator is at least 30 cm from a wall to allow for air circulation around the back and sides.
4. Ensure the power source is labelled clearly to prevent the refrigerator from being accidentally unplugged or turned off. If the power source is exposed, a switch cover may be necessary.

8.3 Defrosting and cleaning a vaccine refrigerator

Our Goal
A refrigerator works well only if it is properly installed, cleaned and defrosted regularly. Thick ice in the freezer compartment does not keep a refrigerator cool. Instead, it makes the refrigerator work harder and uses more power.

Defrosting and cleaning the refrigerator should occur when ice becomes more than ½ cm thick, or once a month, whichever comes first.

Our Practice
In our health centre or nursing station, we follow this practice to defrost and clean the vaccine refrigerator which is not a frost-free unit:

1. Take out all the most heat-sensitive vaccines (OPV, MR, BCG) and transfer them to a cold box lined with frozen ice-packs.
2. Take out all the freeze-sensitive vaccines (DTP-HepB-Hib, TT, hepatitis B, HPV) and diluents, and transfer them to a cold box lined with conditioned ice-packs.
3. Turn off the power supply to the refrigerator.
4. Leave the door open and wait for the ice to melt.
5. DO NOT try to remove the ice with a knife or ice pick; doing so can permanently damage the refrigerator. You can place a pan of boiling water inside and close the door.
6. When all the ice has melted clean the inside of the refrigerator and door seal with a clean wet cloth.
7. Turn the refrigerator on again.
8. When the temperature in the main section falls to +8°C or lower (but not less than +2°C), return the vaccines, diluents, and ice-packs to their appropriate places.
8.4 Maintaining our monitoring equipment

Our Practice
In our health centre or nursing station, we maintain our monitoring equipment by doing the following:

Conduct an accuracy check of the external thermometer (also called “slush” test). An accuracy check should be conducted after receiving a new thermometer and every 12 months or sooner if having thermometer or cold chain problems. Record the results on the temperature chart or log for future reference.

Replace the battery of the thermometer or data logger at least every 12 months or sooner if having thermometer or data logger problems.

8.5 Knowing the accuracy of the external thermometer (“slush” test)

Our Practice
In our nursing station or health centre, we follow this practice to know the accuracy of the external thermometer:

1. Two-thirds fill a polystyrene or plastic cup with cold water.
2. Place cup in the refrigerator freezer until a fine layer of ice forms on the top and small sections of ice form within the fluid. This may take up to 2½ hours.
3. Using this method, the mixture is 0°C if ice is present.
4. Place the temperature probe into the middle of the container. Be careful not to let the probe touch the container.
5. Observe the temperature at 2 minutes.
6. The temperature will drop quickly at first and then more slowly, however the temperature should drop to 0°C within 2 minutes.

Interpreting the results
1. The results should be within one degree above or below 0°C, therefore the display screen may show three possible readings: +1°C, 0°C, -1°C.
2. If not within range, contact National EPI Coordinator on 3328 9888 for further advice.
3. If the temperature reading is 0°C this demonstrates that the thermometer is accurate and can be used as normal.
4. If the temperature reading is either +1°C or -1°C this demonstrates that the accuracy is within acceptable limits and can continue to be used HOWEVER this needs to be:
   • recorded on the temperature chart,
   • taken into account should the thermometer record temperatures outside the +2°C to +8°C range, and
   • included in the details given to National EPI Coordinator when reporting a cold chain breach.

Maintaining cold boxes and vaccine carriers

Vaccine carriers and cold boxes must be well dried after each use. If they are left wet with their lids closed, they will grow mould. Mould may affect the seal of the cold box and vaccine carriers.

Knocks and sunlight can cause cracks in the walls and lids of cold boxes and vaccine carriers. If this happens the vaccines inside will be exposed to heat, please order a new one from the National EPI Coordinator.

If a cold box or vaccine carrier wall has a small crack you may be able to repair it with adhesive tape until you get a new one.
Our cold chain accreditation

Cold Chain Accreditation (CCA) is a tool to support immunisation provider’s cold chain management practises. The CCA has 2 parts:

1. Provider self-assessment
2. Cold Chain Accreditation Immunisation Provider Review

Our Goal
Vaccines are only potent if they are maintained in a temperature range of +2°C to +8°C. Any deviation outside of these ranges may damage the vaccine. CCA is demonstrated through a provider self-assessment followed by an assessment by a CCA reviewer to confirm all CCA requirements have been achieved.

All immunisation providers who store vaccines must achieve CCA, including general practices, health centres, nursing stations, emergency wards and hospital wards. CCA is valid for up to two years based on the CCA reviewer’s findings.

Our Practice
In our health centre, nursing station, general practice, emergency wards or hospital wards we will:

1. Complete a CCA Provider Self-Assessment Form

   a. This is to be completed by the immunisation provider who is mainly responsible for maintaining the cold chain and sent to the National Immunisation Coordinator prior to their CCA review.

   b. Immunisation providers should refer to the Vaccine Storage Guidelines: Keeping it Cold 2013-2016 which covers all the areas of cold chain management required to achieve CCA.

   c. Within 4 weeks of receiving the CCA Provider Self-Assessment form, the National EPI Coordinator will arrange for a CCA review by an appropriate reviewer [see annex 9].

   d. If the health centre, nursing station, general practice, emergency ward or hospital ward have met all the requirements they will receive Cold Chain Accreditation and awarded be a certificate.

   e. Certification will be valid for 2 years. However certification can be withdrawn if standards are not maintained.
Annex 1: refrigeration monitoring chart

| Date | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Indicate the action you took in the comments below | +20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | +18 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | +16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | +14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | +12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | +10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Correct Temperature Range | +8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | +6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | +4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | +2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Indicate the action you took in the comments below | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | -2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | -4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | -6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Temperature Reading (Twice Daily) | AM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | PM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Initial Box when daily or monthly tasks have been completed. Please ensure action is taken to rectify problems as they are identified.

- Refrigerator Level (Daily) Yes/No
- Ice thickness (state # mm)
- Defrost (Monthly)
- Food Check (Daily)
- Cleaning (Monthly)
- Flame (Daily) Blue/Yellow
- Gas Cylinder-spare available? (Daily)
- Check for gas leaks (Monthly)
- Comments

Temperature in °C
Annex 2: How to identify what type of vaccine refrigerator you have

<table>
<thead>
<tr>
<th>Name</th>
<th>Hold over time</th>
<th>Vaccine storage capacity / Gross volume</th>
<th>Picture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Refrigerator</td>
<td>2 hours</td>
<td>Varies</td>
<td></td>
</tr>
<tr>
<td>RCW 50</td>
<td>24 hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ice-lined refrigerator HBC-200</td>
<td>30 hours</td>
<td>90 litres/198 L</td>
<td></td>
</tr>
<tr>
<td>Ice-lined refrigerator MK 204</td>
<td>30 hours</td>
<td>105 litres/218 L</td>
<td></td>
</tr>
<tr>
<td>Refrigerator Solar direct drive, ancillary battery MkS 044</td>
<td>5 days</td>
<td>19.5L/48L</td>
<td></td>
</tr>
<tr>
<td>Combined ice-lined refrigerator-water-pack freezer MK 074</td>
<td>30 hours</td>
<td>16L/54L</td>
<td></td>
</tr>
<tr>
<td>Ice lined refrigerator MK 204</td>
<td>30 hours</td>
<td>75L/136 L</td>
<td></td>
</tr>
</tbody>
</table>
Annex 3: Vaccine vial monitors

- **Ampoule of freeze-dried vaccine**
  - Inner square lighter than outer circle. *If the expiry date has not been passed, USE the vaccine*

- **Vial of freeze-dried vaccine**
  - At a later time, inner square still lighter than outer circle. *If the expiry date has not been passed, USE the vaccine*

- **Vial of liquid vaccine**
  - Discard point: Inner square matches colour of outer circle. *DO NOT use the vaccine. Inform the supervisor*

  - Beyond the discard point: Inner square darker than outer circle. *DO NOT use the vaccine. Inform the supervisor*
## Annex 4: Types of vaccine carriers

<table>
<thead>
<tr>
<th>Model no</th>
<th>Manufacturer</th>
<th>Capacity</th>
<th>Product type</th>
<th>Rated Cold Life [with non-conditioned ice packs]</th>
<th>Rated Cool Life [with conditioned ice packs]</th>
<th>Picture</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVC-46</td>
<td>AOV International, India</td>
<td>2.5L</td>
<td>Long range</td>
<td>50hrs with 0.6 L ice-pack-frozen</td>
<td>10hrs with 0.6 L cool ice packs at +5°C</td>
<td><img src="image" alt="AVC-46" /></td>
</tr>
<tr>
<td>AIDVC 24</td>
<td>Apex International</td>
<td>0.90 L</td>
<td>Short range</td>
<td>15 hrs with frozen ice-packs of 0.40L</td>
<td>21.5 hrs with 0.40L ice packs at +5°C</td>
<td><img src="image" alt="AIDVC 24" /></td>
</tr>
<tr>
<td>AIDVC 24</td>
<td>Apex International</td>
<td>Short range</td>
<td>10 hours with frozen ice-packs of 0.40L</td>
<td>4 to 8 hours with 0.40L ice packs at +5°C</td>
<td><img src="image" alt="AIDVC 24" /></td>
<td></td>
</tr>
</tbody>
</table>
### Annex 5: Work order form

<table>
<thead>
<tr>
<th>Date request received</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Person reporting problem</td>
<td></td>
</tr>
<tr>
<td>Location of equipment</td>
<td></td>
</tr>
<tr>
<td>Faulty equipment</td>
<td></td>
</tr>
<tr>
<td>(type of model or Code number)</td>
<td></td>
</tr>
<tr>
<td>Date of visit by Cold Chain Technician</td>
<td></td>
</tr>
<tr>
<td>His name</td>
<td></td>
</tr>
<tr>
<td>Was the equipment fixed during his visit</td>
<td>YES/NO</td>
</tr>
<tr>
<td>If NO, what action has being taken to remedy the problem?</td>
<td></td>
</tr>
</tbody>
</table>
## Annex 6: Types of cold boxes

<table>
<thead>
<tr>
<th>Model no</th>
<th>Manufacturer</th>
<th>Capacity</th>
<th>Rated Warm Life (-20^\circ C)</th>
<th>Rated Cold Life (+43^\circ C)</th>
<th>Rated Cool Life (+43^\circ C)</th>
<th>Picture</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACB 246LS</td>
<td>AOV Int., India</td>
<td>16L</td>
<td>31hrs 22mins</td>
<td>93hrs 33mins</td>
<td>20hrs 42mins</td>
<td><img src="image1.png" alt="Picture" /></td>
</tr>
<tr>
<td>ACB 503L</td>
<td>AOV, India</td>
<td>18L</td>
<td>44hrs 44mins</td>
<td>126hrs 32mins</td>
<td>28hrs 05mins</td>
<td><img src="image2.png" alt="Picture" /></td>
</tr>
</tbody>
</table>
Annex 7: How to check for a gas leak & cleaning a flue

1. Checking for a gas leak

DO NOT smoke or allow any flames nearby while checking for gas leaks.

1. Dissolve some soap in a small quantity of water.
2. Brush all connections and gas supply line with the soapy water.
3. Open the valve on the gas bottle.
4. Watch each connection for bubbles.
5. Bubbles indicate a leak. If there is a leak, turn off the gas supply immediately.
6. Tighten the leaking connection.
7. Check the connection again.
8. If there is still a leak you may need to replace the part.
9. If there is a leak in the gas supply line replace it.
10. If you are unable to repair a leak DO NOT use the refrigerator on gas mode and report it immediately.
11. If the connection no longer leaks check all connections in the same way.
2. **Cleaning the flue and baffle (Gas refrigerator only)**

<table>
<thead>
<tr>
<th>Step</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Turn off the gas supply.</td>
</tr>
<tr>
<td>2.</td>
<td>Remove the back cover.</td>
</tr>
<tr>
<td>3.</td>
<td>Remove screw to burner.</td>
</tr>
<tr>
<td>4.</td>
<td>Remove the screw to the burner protection plate and remove burner protection plate.</td>
</tr>
<tr>
<td>5.</td>
<td>Remove the burner and clean the burner from dust.</td>
</tr>
<tr>
<td>6.</td>
<td>Remove the baffle from the flue.</td>
</tr>
</tbody>
</table>
7. Clean the flue with the supplied brush until dirt stops falling

8. Clean the baffle

9. Replace the baffle in the flue

10. Replace the burner ensuring the burner is facing up
11. Screw the burner protection plate back on ensuring the window is facing you

![Image of burner protection plate being screwed back on]

12. Replace the burner holder screw

![Image of burner holder screw being replaced]

13. Replace the back cover Turn on the gas and light the burner ensuring there is a blue flame

![Image of blue flame]

Replace the burner ensuring the burner is facing up

Window

Burner holder screw

Blue flame
Cold chain accreditation provider self-assessment form

Cold Chain Accreditation (CCA) is a tool to support your cold chain management practices. CCA is demonstrated through a provider self-assessment followed by a review to confirm all CCA requirements have been achieved. All immunisation providers who store and/or offer vaccines must achieve CCA, including general practices, health centres, nursing stations, emergency wards and hospital wards.

Notes to providers:
All vaccines must be stored between +2°C and +8°C at all times to ensure vaccine potency is not destroyed by heat or freezing during storage.

All immunisation providers must use a designated vaccine refrigerator to store vaccines to achieve CCA. The use of a domestic refrigerator to store vaccines is only possible in the short term and all providers are expected to make the change to a designated vaccine refrigerator within an agreed timeframe with the National EPI Coordinator.

Completing this form will assist you to achieve CCA.

Please complete and return this form to your the National EPI Coordinator to your review. If you are unsure about any questions on this form contact you’re the National EPI Coordinator or leave the questions blank to discuss during your CCA review.

If you answer ‘no’ to any questions the National EPI Coordinator will discuss your response prior to or at the time of your CCA review.

Fax or email the completed form to 338 8003 or litiana.volavola@govnet.gov.fj to arrange an appointment for your CCA review.

Immunisation provider details

| Name Clinic: | Name of individual(s) completing the self-assessment: |
| Physical address: | Postal address: |
| Contact details: | Phone: Fax: Email: |
| Date of CCA self-assessment: | Preferred appointment days/times: |

Vaccine reference information

| Do you have copies of or access to the: | Yes | No |
| Current Fiji National Immunisation Policy | |
| current EPI Trainers Learners Guide | |
| Temperature Monitoring Charts | |
| current Vaccine Storage Guidelines: Keeping it Cold 2013-2016 | |

Provider policies

The Ministry of Health has developed Vaccine Storage Guidelines: Keeping it Cold 2013-2016 covering all the areas of cold chain management required to achieve CCA. Contact the National EPI Coordinator if you have any questions about the template or your own guidelines.

| Does your workplace Vaccine Storage Guidelines include the following information: | Yes | No |
| a) designated staff member(s) responsible for your cold chain management (ie, two or more staff) | |
| b) vaccine stock requirements | |
| c) vaccine ordering and stock keeping processes | |
| d) receipt and storage of vaccines processes | |
| e) maintenance plan and schedule for all your cold chain equipment [refer Refrigerator Monitoring Chart] | |
| g) refrigerator temperature monitoring processes | |
| h) actions if your temperature recordings are outside the +2°C to +8°C range | |
| i) emergency plans for dealing with equipment and/or power failures | |
| j) process for the disposal of vaccines | |
| k) annual review of your cold chain practices | |
| l) orientation of new staff to cold chain practices as necessary. | |
If you answered ‘no’ to any of these questions please ensure you update your cold chain management practices to include the relevant information. Ensure your cold chain management practices has been updated prior to your CCA review. If you have any questions, please contact the National EPI Coordinator.

**Temperature monitoring and refrigerator performance**

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you use a designated vaccine refrigerator to store vaccines?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If no, when do you plan to purchase a designated vaccine refrigerator?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you have the last three months of your Refrigerator Monitoring Chart available to discuss at the time of your CCA review?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Where do you store your Refrigerator Monitoring Chart in the short (&lt; 3 months) and long term (&gt;3 months)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has your refrigerator temperature been outside the +2°C to +8°C range?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If yes, what action was taken and was that action documented? Please attach the documentation to this form.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Vaccine refrigerator details (enter information for each refrigerator where vaccine is stored)**

<table>
<thead>
<tr>
<th>Refrigerator</th>
<th>Refrigerator 2</th>
<th>Refrigerator 3</th>
<th>Refrigerator 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brand</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model number</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year first installed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the top of the refrigerator kept clear of all other equipment?</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Checklist (please tick as appropriate)**

<table>
<thead>
<tr>
<th>Checklist</th>
<th>Tick</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fax or email the National EPI Coordinator:</td>
<td></td>
</tr>
<tr>
<td>completed CCA Provider Self-Assessment Form</td>
<td></td>
</tr>
<tr>
<td>Have available for your review:</td>
<td></td>
</tr>
<tr>
<td>the designated person(s) responsible for your cold chain management</td>
<td></td>
</tr>
<tr>
<td>the last three months of Refrigerator Monitoring Chart</td>
<td></td>
</tr>
<tr>
<td>the actions taken if your Refrigerator Monitoring Charts have been outside the +2°C to +8°C range</td>
<td></td>
</tr>
<tr>
<td>your vaccine stock register.</td>
<td></td>
</tr>
<tr>
<td>Arrange an appointment for your CCA review.</td>
<td></td>
</tr>
</tbody>
</table>

Signature:                                                                Date:
Comments:
Cold chain accreditation immunisation provider review

Cold Chain Accreditation (CCA) is a tool to support an immunisation provider’s cold chain management practices. CCA is demonstrated through a provider self-assessment. A review of the provider’s self-assessment will confirm whether the provider has achieved CCA or requires further actions to meet the CCA requirements.

Notes to reviewers:

All vaccines must be stored between +2°C and +8°C at all times to ensure vaccine potency is not destroyed by heat or freezing during storage.

All providers storing vaccines must achieve CCA including general practices, health centres, nursing stations, emergency wards and hospital wards.

CCA cannot be achieved if the provider does not use a designated vaccine refrigerator to store vaccines. The use of a domestic refrigerator to store vaccines is only possible in the short term and all providers are expected to make the change to a designated vaccine refrigerator within an agreed timeframe with the National EPI Coordinator.

An interim plan is able to be put in place while the provider works towards meeting the CCA requirements. The provider is still able to administer vaccines while this interim plan is being implemented, if the recommended temperature range of +2°C and +8°C can be maintained at all times.

| Name of clinic being reviewed: | |
| Date of review: | |
| Name of CCA reviewer: | |
| Name(s) of staff undertaking CCA review: | |

**Type of provider**

| General practice | ☐ | Emergency Ward | ☐ | Other Hospital Ward | ☐ |
| Health Centre | ☐ | Maternity Ward | ☐ |
| Nursing Station | ☐ |

**Criteria**

<table>
<thead>
<tr>
<th>Criteria: Vaccine reference information</th>
<th>Yes</th>
<th>No</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 The provider has copies of or access to the:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) current EPI Trainers Learners Guide</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>b) current Temperature Monitoring Charts</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>c) Vaccine Storage Guidelines: Keeping it Cold 2013-2016</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>d) Current Fiji National Immunisation Policy</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Criteria: Provider’s cold chain practices</td>
<td>Met</td>
<td>Not met</td>
<td>Comments</td>
</tr>
<tr>
<td>------------------------------------------</td>
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</tr>
<tr>
<td>2 The provider has a Vaccine Storage Guidelines: Keeping it Cold 2013-2016 available for review.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) names of the designated staff member(s) responsible for cold chain management (ie, two or more staff)</td>
<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>b) vaccine and stock requirements for their workplace</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>c) vaccine ordering and stock keeping processes (ie, vaccines are logged in a vaccine stock book)</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>d) stock book</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>g) cold chain equipment maintenance plan and schedule [refer Refrigerator Monitoring Chart]</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>h) vaccine Refrigerator Monitoring Chart</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>i) action to be taken when the refrigerator temperature recordings are outside the + 2°C to + 8°C range</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>j) emergency plans in the event of an equipment and/or power failure</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>k) process for vaccine disposal</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>m) a cold chain orientation plan for new staff (as necessary)</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>n) all relevant staff have read and signed the Vaccine Storage Guidelines: Keeping it Cold 2013-2016.</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>If the provider’s Vaccine Storage Guidelines: Keeping it Cold 2013-2016 does not include all of the information listed above, do they have a plan in place to update their clinic with the necessary information?</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Yes ☐ No ☐ When:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Criteria: Vaccine stock management</th>
<th>Met</th>
<th>Not met</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 The provider understands the importance of vaccine stock management and:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) can explain the importance of vaccine stock management (ie, to ensure vaccines are protected from cold chain breech, maintain vaccine potency, minimise vaccine wastage due to cold chain failure and to allow air to circulate in the refrigerator)</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>b) can produce their current stock book</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>c) orders vaccines at appropriate frequencies to maintain their stock levels for 1 month and this is reflected in their vaccine stock book</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>d) ensures their vaccine stock does not exceed the refrigerator maximum storage capacity</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>e) can describe the appropriate process for the receipt of vaccines</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>f) rotates vaccine stock on receipt of a vaccine order to ensure the shortest expiry dates are used first</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>g) maintains a 25–30 mm space between: each vaccine package and the vaccine packages being stored at the back and sides of the refrigerator and the shelf above</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>h) stores all vaccines in their original packaging/boxes</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
</tbody>
</table>
### Vaccine Storage Guidelines: Keeping it Cold 2013-2016

<table>
<thead>
<tr>
<th>Criteria: Temperature monitoring, refrigeration performance and equipment</th>
<th>Met</th>
<th>Not met</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 The provider is aware of the requirements for temperature monitoring and refrigeration performance and:</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>a) is aware all vaccines must be stored between the +2°C to +8°C temperature range</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>b) can describe and interpret a vaccine vial monitor and when to discard vaccines</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>c) can describe their processes to identify a deviation from the +2°C to +8°C temperature range and their actions if the temperature falls outside this range</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>d) is able to state which vaccines are heat sensitive</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>e) is able to state which vaccines are freeze sensitive</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>f) has the last three months of daily minimum and maximum Refrigerator Monitoring Charts at their CCA review.</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>g) reviews their refrigerator(s) temperature performance monthly to check for inconsistencies or temperature changes and documents the results and the actions taken</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>h) documents their actions following any cold chain failure and their response reflects that appropriate action was taken.</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>4.3 Are temperature monitoring devices included in the vaccine orders received by the provider (e.g., freeze tags)?</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>If yes, can they describe what to do with these temperature monitoring devices?</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>4.4 Provider retains all temperature documentation for at least 1 years.</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>How is the information accessed?</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Where is this information stored?</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>4.5 Provider can describe their vaccine storage plan in the event of an equipment and/or power failure.</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>4.6 Provider has vaccine thermometers, fridge tags or freeze tags.</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Does the device record the temperature at the required parameters?</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>4.7 Provider has standard vaccine carriers, cold boxes, ice packs and foam pads that are all in good order.</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>There are appropriate vaccine carriers available for the number is nurses in the clinic.</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Are foam pads available in good condition for each vaccine carrier?</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Are there enough ice packs available for each vaccine carrier and additional stock for daily rotation</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Criteria: Vaccine refrigerator requirements</td>
<td>Met</td>
<td>Not met</td>
<td>Comments</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>-----</td>
<td>---------</td>
<td>----------</td>
</tr>
<tr>
<td>Refrigerator(s)</td>
<td>1</td>
<td>2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>5.1 Does the provider use a designated vaccine refrigerator to store vaccines? Yes [ ] No [ ]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If no, do they have a plan in place to purchase a designated vaccine refrigerator and by when? Yes [ ] No [ ] When:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.2 Is there non-medical material stored in the refrigerator? Yes [ ] No [ ]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.3 The provider’s refrigerator is placed in a well-ventilated room (away from direct sunlight or sources of heat). Yes [ ] No [ ]</td>
<td></td>
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</tr>
<tr>
<td>5.4 There is a space of at least 30cm from the back and sides of the refrigerator’s surfaces (to allow for circulation around the condenser). Yes [ ] No [ ]</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5.5 The refrigerator is connected to the power via an independent power point. Yes [ ] No [ ]</td>
<td></td>
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<tr>
<td>5.6 The refrigerator connection is labelled as ‘not to be disconnected’. Yes [ ] No [ ]</td>
<td></td>
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</tr>
<tr>
<td>5.7 If necessary there is a spare full gas cylinder available. Yes [ ] No [ ]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Results available from last external validation. Date: By whom: Frequency:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.8 The provider checks their refrigerator door seal and cleans the refrigerator at least every month months. Yes [ ] No [ ]</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5.9 The vaccine provider defrosts the refrigerator at least months or when the ice is &gt;5 cm thick</td>
<td></td>
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</tr>
</tbody>
</table>
Temperature validation at the time of CCA review

<table>
<thead>
<tr>
<th>Minimum:</th>
<th>Maximum:</th>
<th>Current/average:</th>
</tr>
</thead>
</table>

Provider refrigerator details

<table>
<thead>
<tr>
<th>Refrigerator 1</th>
<th>Refrigerator 2</th>
<th>Refrigerator 3</th>
<th>Refrigerator 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brand:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year installed:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Provider CCA summary

<table>
<thead>
<tr>
<th>Vaccine reference information</th>
<th>Met</th>
<th>Not met</th>
<th>Timeframe / completion date</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) current EPI Trainers Learners Guide</td>
<td>□</td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>b) current Temperature Monitoring Charts</td>
<td>□</td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>c) Vaccine Storage Guidelines: Keeping it Cold 2013-2016</td>
<td>□</td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>d) Current Fiji National Immunisation Policy</td>
<td>□</td>
<td>□</td>
<td></td>
</tr>
</tbody>
</table>

Vaccine refrigerator requirements:

<table>
<thead>
<tr>
<th>Refrigerator 1</th>
<th>Refrigerator 2</th>
<th>Refrigerator 3</th>
<th>Refrigerator 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

Provider has achieved CCA:

Yes □ No □

If no, what action is required by the provider to improve their cold chain management and achieve CCA? □ □

Action:

Duration of CCA: □ □

Next CCA review date: □ □

Signature: Date:

Comments:

October 2013