

Cold Chain Management

Immunisation Unit
Health Protection NSW



Health

Types of vaccine storage

- Purpose-built vaccine refrigerators are best practice and are the recommended vaccine storage option.
- Domestic refrigerators are not recommended for vaccine storage, however if a domestic refrigerator is the only vaccine storage option, refer to Appendix 4 in the *National Vaccine Storage Guidelines Strive for 5 2nd Edition*
- **Bar and cyclic defrost domestic refrigerators MUST NOT be used to store vaccines.**

Fridge monitoring

ALL PROVIDERS MUST HAVE:

1. Min/max thermometer

A battery powered min/max thermometer must be available during a power outage to continue to monitor the fridge temperature or cooler if long term storage is required

2. Data logger

Each fridge must be continuously monitored using either an in-built or external data logger. Data loggers should be downloaded once per week to check for excursions outside +2°C to +8°C (known as a cold chain breach). Refer to the cold chain breach presentation for detailed information

Fridge monitoring

- ✓ Record minimum and maximum temperatures first thing in the morning (i.e. before the refrigerator is used for the first time) and at the end of the day
- ✓ Reset the min/max thermometer after reading
- ✓ Record any events, such as deliveries
- ✓ Follow cold chain breach protocol if temperature outside $+2^{\circ}\text{C}$ to $+8^{\circ}\text{C}$

Data loggers

- What is a data logger?

Temperature data loggers are small electronic devices that measure temperatures at pre-set time intervals and record the results over a period of time. Data loggers should be set to record temperatures at 10-15 minute intervals.

- Why is it useful?

It provides information on the duration of and temperatures during a cold chain breach. This helps to determine the efficacy of the vaccines after the cold chain breach

Data loggers

- There are a range of data loggers available for Windows based computers
- Mac computer users will require a wireless data logger as it is more compatible
- Some popular brands are:
 - Tinytag
 - HOBO
 - Enlake
 - Logtag

(NSW Health does not endorse any particular brand of data logger)

Min/max thermometer

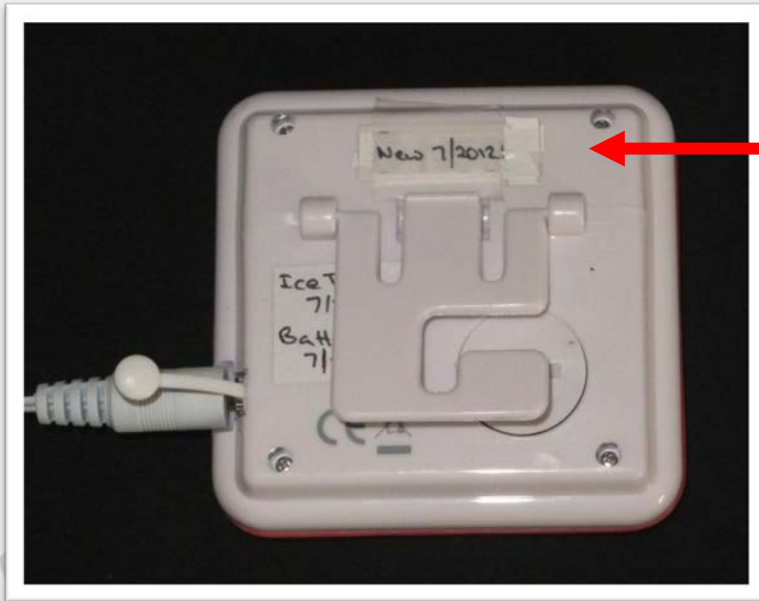
A battery operated minimum/maximum thermometer is essential for monitoring the temperature of the fridge, particularly in a power outage. It must be reset after each reading

New min/max thermometers –

Remove the plastic tab from the back of the min/max thermometer to ensure the battery is activated

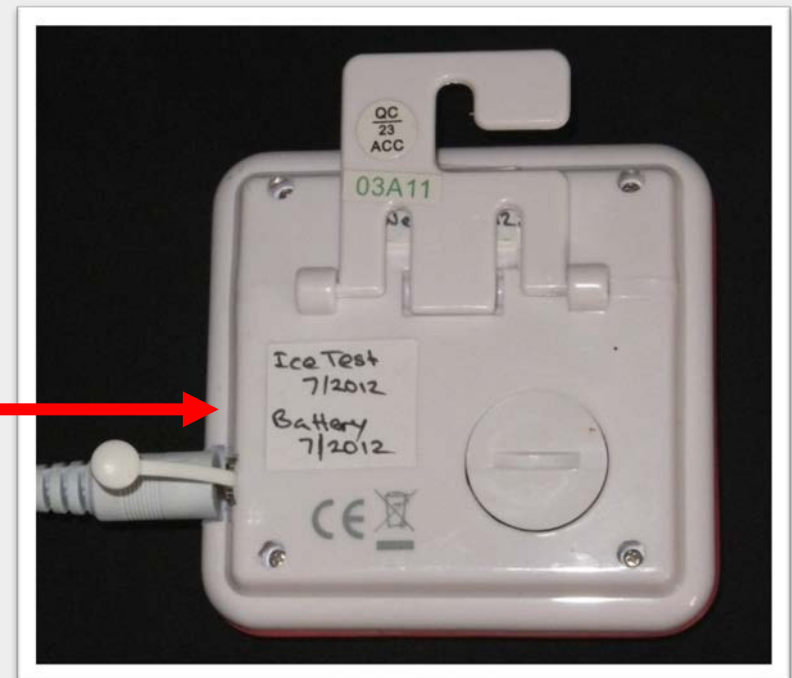


Min/max thermometer – battery change

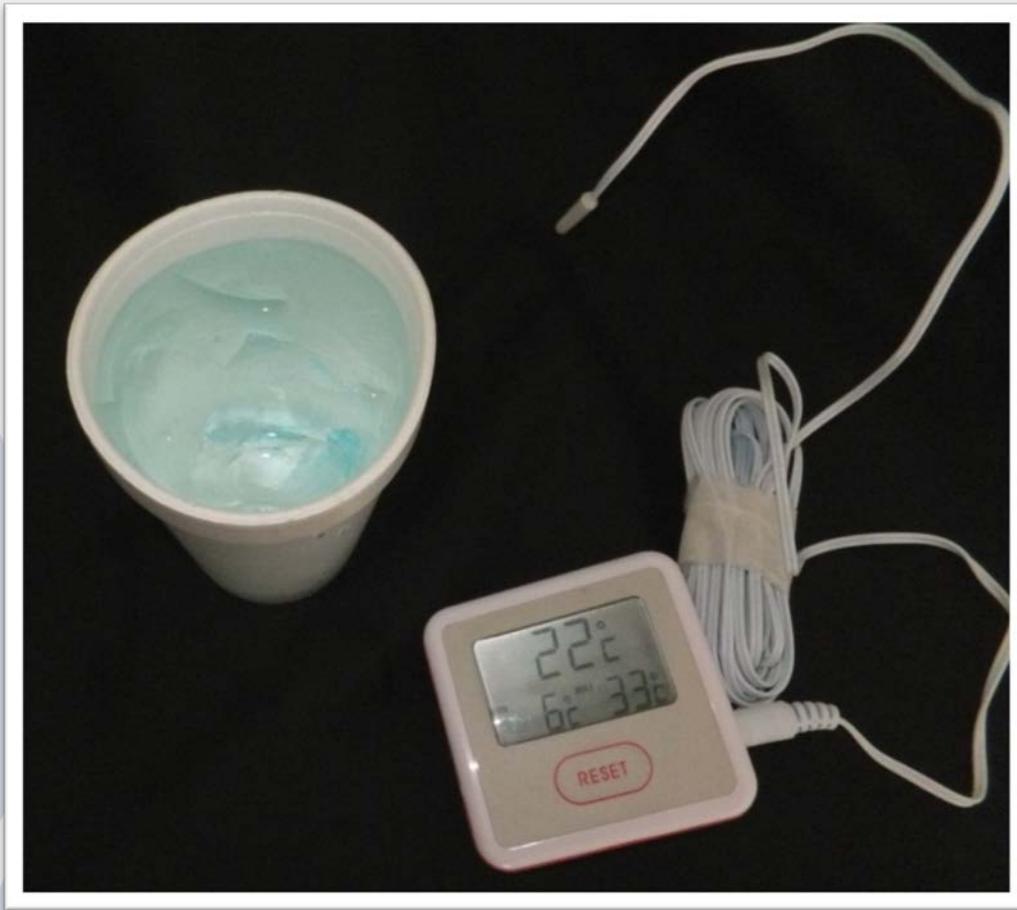


Record date that the new min/max thermometer was replaced

Record the date that the battery was changed and ice slurry performed



Min/max thermometer – ice slurry test



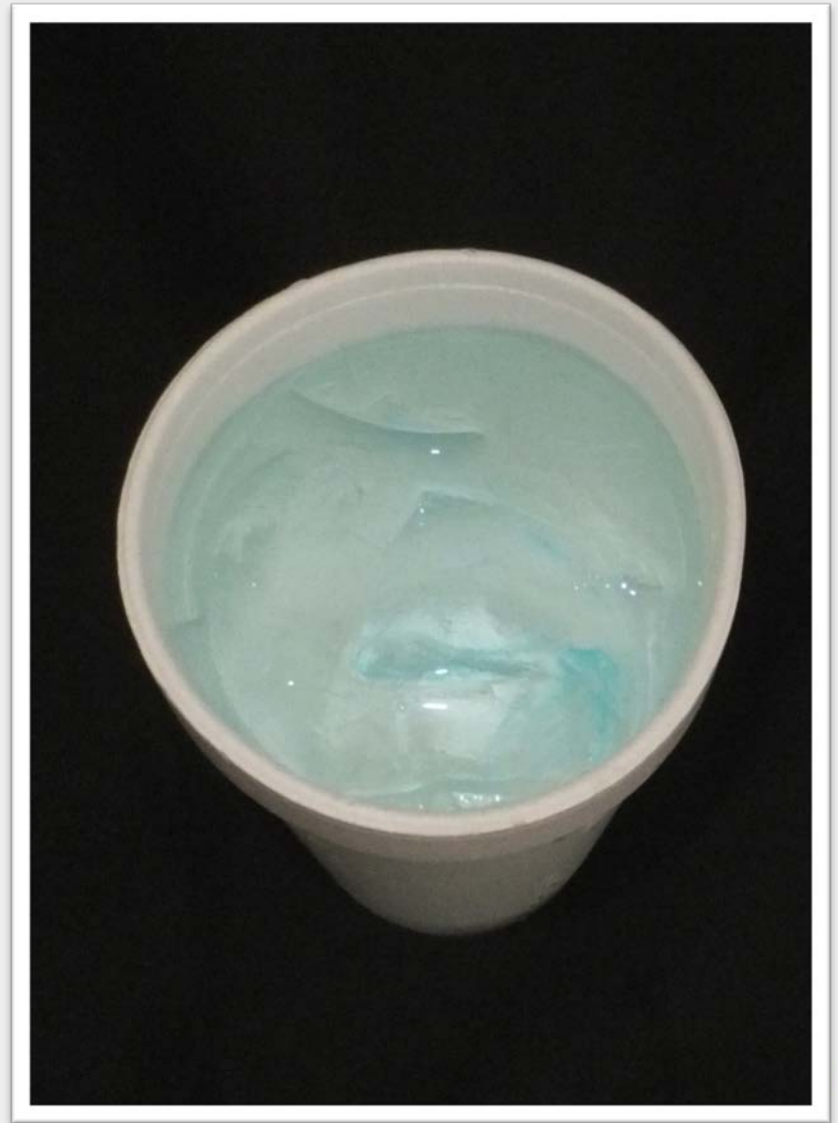
An ice slurry test is performed on min/max thermometers to check the accuracy of the thermometer

Collect the following items:

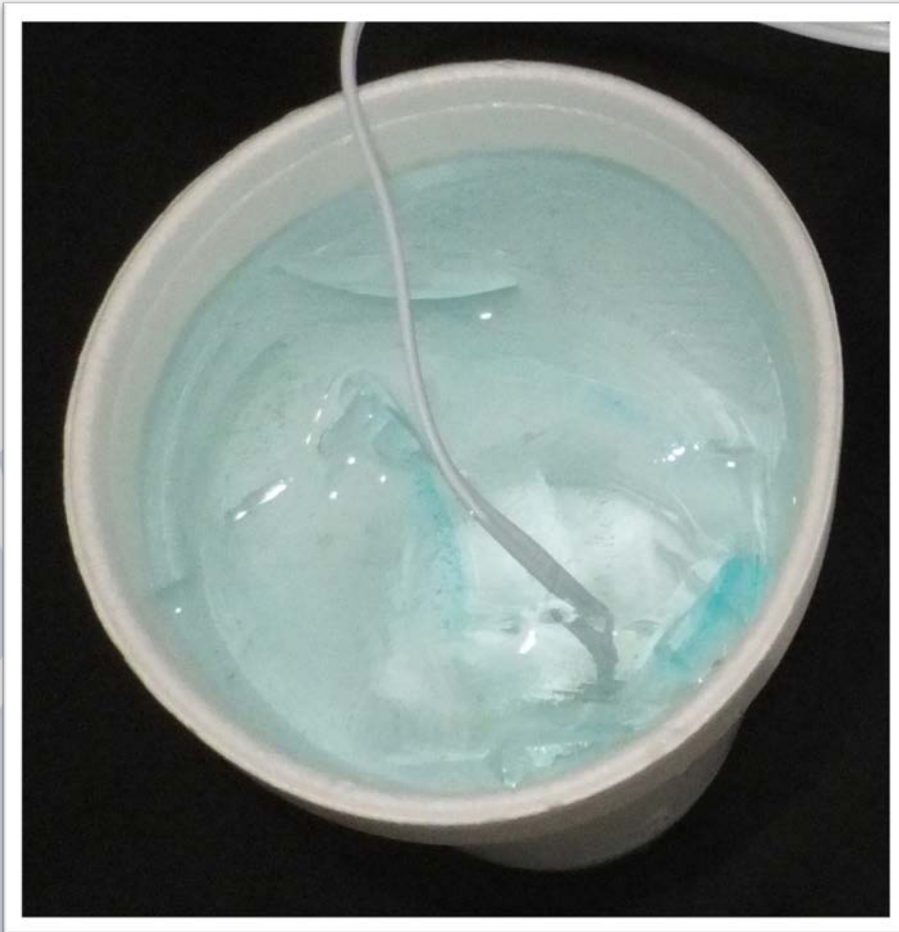
- min/max thermometer
- water in foam cup

Min/max thermometer – ice slurry test

1. Collect a foam cup and 2/3 fill with water
2. Place the foam cup in freezer
3. Wait until a fine layer of ice forms on top of the water (could take up to 2 ½ hours)



Min/max thermometer – ice slurry test



Place the min/max thermometer probe into the ice slurry and ensure that the probe does not touch the side

Min/max thermometer – ice slurry test

Leave the min/max thermometer probe in the ice slurry until it reaches 0°C (or -1°C/+1°C)



Then press **RESET**

Min/max thermometer – ice slurry test

- Leave the probe in the ice slurry for 2 minutes
- If 0°C is not achieved, replace the battery again and repeat the ice slurry test
- If this fails to reach 0°C - replace the min/max thermometer



Completion of ice slurry test

Upon completion of the ice slurry test, remove the probe from the ice slurry and dry it thoroughly.



Min/max thermometer – frequency of checks

Batteries must be replaced:

- Every 12 months
- If thermometer is flashing

An ice slurry test must be performed:

- Annually
- After every battery change
- In the event of cold chain problems (see page 25 Strive for 5)

Min/max thermometers must be replaced:

- If the min/max thermometer or probe or wire is damaged
- If the min/max thermometer is malfunctioning and/or not calibrating



Min/max thermometer – set up



Collect:

- Empty vaccine box
- Product information sheet
- Plastic tray insert
- Sticky tape
- Pen
- Label

Min/max thermometer – set up



Place min/max thermometer probe into vaccine tray insert and secure with tape

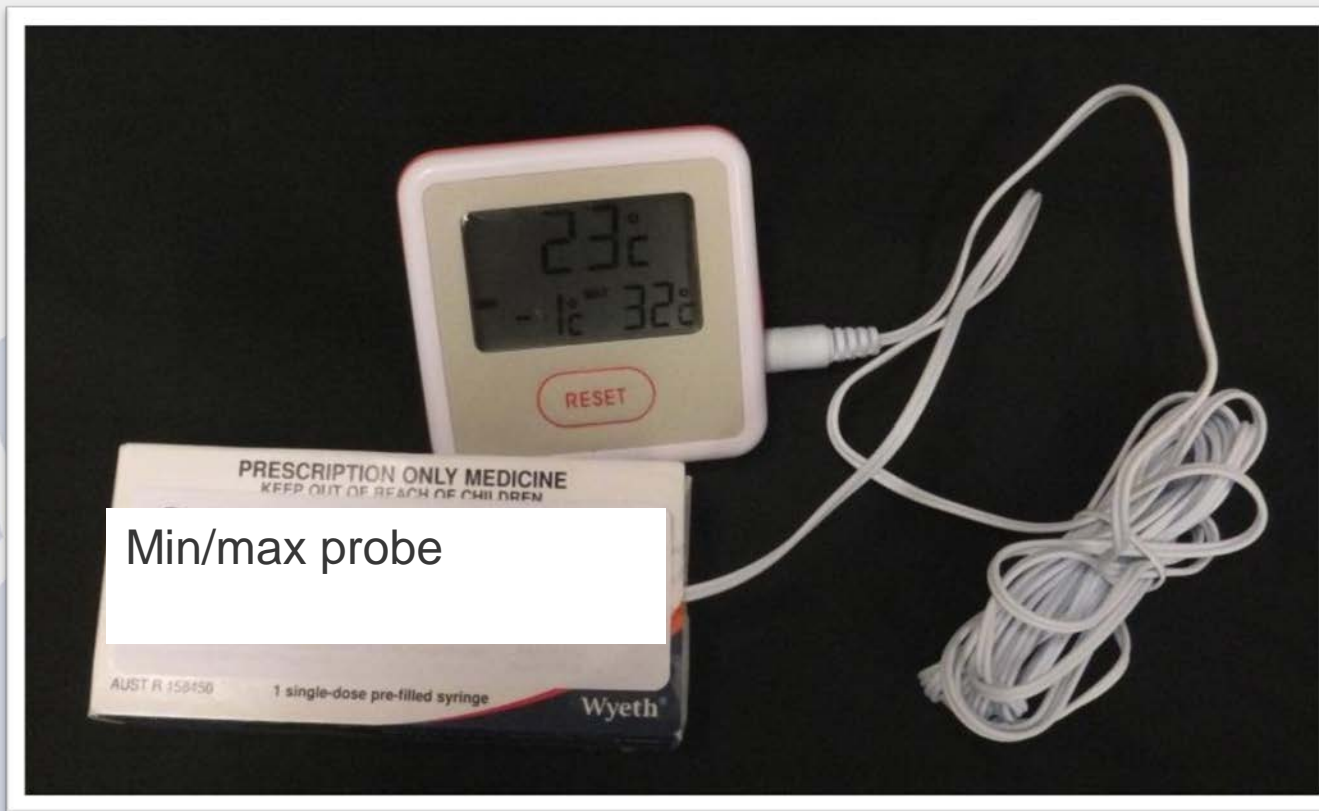
Place the secured probe into the vaccine box with the product information sheet



Storing the probe like this mimics the same environment as the vaccine

Min/max thermometer – set up

Label the outside of the vaccine box to ensure the probe is not removed.



Min/max thermometer – set up



Prior to use, allow the current fridge temperature to return to **+2°C to +8°C**, then:

Press **RESET**

Document battery change and ice slurry test in the 'comments' section of the daily fridge temperature chart

Min/max thermometer – set up



The min/max thermometer is now calibrated & ready to use.

Place probe on middle shelf, towards the back

Moving premises

- BEFORE you move:
 - Only place small orders of vaccines to minimise the number of vaccines to be moved
 - Contact the PHU on 1300 066 055 who will provide advice on maintaining the cold chain during the move
- AFTER you move:
 - You will need to provide 24 hours of data logging to the PHU to demonstrate that the fridge is stable following the move and before vaccines can be used

Remember to:

- Protect vaccines from ultraviolet light by leaving in original packaging
- Distribute stock evenly throughout the fridge
- Rotate stock to bring shortest expiry date to the front to use first
- Ensure stock is not placed against evaporation plate at back of the fridge
- Leave space to allow for air to circulate between vaccines (i.e. do not overstock)
- Ensure plastic trays are used to allow for air to circulate

Strive for 5



Australian Government
Department of Health and Ageing

National Vaccine Storage Guidelines

Strive for 5

2nd Edition



A joint Australian, State and
Territory Government initiative

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Refer to Strive for 5
for vaccine
management and
cold chain
recommendations



Health

Acknowledgement

- Barbara Wilson, Immunisation Coordinator, Albury Public Health Unit, for providing cold chain information and images