Effect of Temperature on Vaccines

- Live vaccines
  - tolerate freezing
  - deteriorate rapidly after removal from freezer
- Inactivated vaccines
  - damaged by exposure to freezing temperatures
  - tolerate short time out of refrigeration

Cold Chain

- Vaccines must be stored properly from the time they are manufactured until they are administered to your patients
  - Manufacturer to distributor
  - Distributor to office
  - Office to patient

Vaccine Storage and Handling Guidelines

- Develop and maintain detailed written protocol
- Assign responsibilities to one person
- Designate a back-up person
- Provide training on vaccine storage and handling

Vaccine Storage Requirements

- Maintain required temperature range throughout the year
- Separate doors for refrigerator and freezer
- Large enough to hold year's largest vaccine inventory
- Dedicated to biologics (no food or beverages!)
- Dorm-style refrigerators should NOT be used to store varicella vaccine, MMRV or LAIV
**Recommended Temperatures**

<table>
<thead>
<tr>
<th>Refrigerator</th>
<th>Freezer</th>
</tr>
</thead>
<tbody>
<tr>
<td>35° - 46°F or 2° - 8°C</td>
<td>≤+5°F or ≤-15°C</td>
</tr>
<tr>
<td>Average 40°F (5°C)</td>
<td>(varicella, MMRV &amp; LAIV)</td>
</tr>
</tbody>
</table>

**Temperature Monitoring**

- Check and record the temperatures twice a day
- Use temperature log for both refrigerator and freezer compartments
- Keep temperature logs for at least 3 years
- Take immediate action when the temperature is outside the recommended range
- Do NOT administer mishandled vaccine

**Temperature Monitoring**

- Separate thermometer for refrigerator and freezer compartments
- Use good quality certified calibrated thermometer (biosafe liquid, continuous graphic, or minimum/maximum)
- Manually check temperatures twice a day even if using continuous graphic thermometer

**Certified Calibrated Thermometers**

- Use a plug guard or safety-lock plug
- Post a warning sign above the plug and on the refrigerator
- Label fuses and circuit breakers
- Install a temperature alarm

**Preventive Measures**
Preventive Measures
- Remove vegetable bins and replace with bottles of water to stabilize refrigerator temperature
- Keep extra cold packs or blue ice in the freezer
- Never store vaccines in the door of the refrigerator or freezer

Prefilling Syringes
- Increases the risk for administration errors
- Increases vaccine wastage
- May result in bacterial growth in vaccines that do not contain a preservative

Vaccine Inventory Control
- Conduct a monthly vaccine inventory
- Avoid stocking excessive vaccine supplies
- Monitor expiration dates
- Rotate stock
- Never use expired vaccine or diluent

Emergency Planning
- Develop an emergency vaccine retrieval and storage plan
- Identify a back-up site with a generator in the event of equipment failure or power outage
Vaccine Storage and Handling Toolkit

- NIP website
  http://www2a.cdc.gov/nip/isd/shtoolkit/splash.html
- CD-ROM (item # 99-8263)
  https://www2.cdc.gov/nchstp_od/PIWeb/niporderform.asp

National Immunization Program
Contact Information

- Telephone 800.CDC.INFO
- Email nipinfo@cdc.gov
- Website www.cdc.gov/nip