

Vaccine Storage and Handling Toolkit

National Center for Immunization and Respiratory Diseases

Site Map

The Cold Chain

[What Is the Cold Chain?](#)

[Importance of Maintaining the Cold Chain](#)

[Vaccine Potency](#)

[Vaccine Appearance After Exposure to Inappropriate Storage Conditions](#)

[Burden of Cold Chain Failure](#)

[References](#)

Storage and Handling Plans

[General Recommendations](#)

[Routine Vaccine Storage and Handling Plan](#)

[Emergency Vaccine Retrieval and Storage Plan](#)

[General Guidelines](#)

[Advance Preparations](#)

[Emergency Actions](#)

Vaccine Personnel

[Primary Vaccine Coordinator and Backup Vaccine Coordinator](#)

[Other Staff](#)

[Training](#)

Vaccine Storage Equipment

[General Requirements](#)

[Backup Equipment](#)

[Equipment Logbooks](#)

[Refrigerators and Freezers](#)

[Equipment Requirements](#)

[General Requirements](#)

[Dormitory-Style Units](#)

[Frost-Free Versus Manual Defrost Freezers](#)

[Equipment Placement](#)

[Recommended Temperature Range](#)

[Refrigerator](#)

[Freezer](#)

[Setting and Stabilizing the Temperature](#)

[Who Should Adjust the Temperature?](#)

[Thermostats](#)

[How to Adjust the Temperature](#)

[When to Adjust the Temperature](#)

[Stabilizing the Temperature with Water Bottles and Frozen Packs](#)

[Opening the Door](#)

[Vegetable Bins](#)

[Temperature Variations](#)

[Equipment Maintenance](#)

[General Principles](#)

[Daily Maintenance Tasks](#)

[Check the Internal Temperature](#)

[Check That the Doors Are Closed](#)

[Weekly Maintenance Tasks](#)

[Defrost the Freezer \(Manual Defrost Units ONLY\)](#)

[Monthly Maintenance Tasks](#)

[Clean the Coils and Motor](#)

[Clean the Refrigerator and Freezer Compartments](#)

[Check the Door Seals](#)

[Periodic Maintenance Tasks](#)

[Clean the Drain Pan](#)

[Thermometers](#)

[Certified Calibrated Thermometers](#)

[Types of Certified Calibrated Thermometers](#)

[Overview](#)

[Fluid-Filled Biosafe Liquid Thermometers](#)

[Bi-Metal Stem Thermometers](#)

[Minimum/Maximum Thermometers](#)

[Digital Thermometers](#)

[Chart Recorders](#)

[Digital Data Loggers](#)

[Other Thermometers – NOT RECOMMENDED](#)

[Thermometer Placement](#)

[Thermometer Maintenance and Recertification](#)

[Cold Chain Monitors](#)

[General Principles](#)

[Types of Cold Chain Monitors](#)

[Heat Indicators](#)

[Freeze Indicators](#)

[Data Loggers](#)

[Using Cold Chain Monitors](#)

[Vaccine Security](#)

[Protecting the Power Supply](#)

[Temperature Alarms](#)

[Backup Generators](#)

[Emergency Vaccine Retrieval and Storage Plans](#)

Vaccine Storage Practices

[Appropriate Vaccine and Diluent Storage Conditions](#)

[Live Vaccines](#)

[Inactivated Vaccines](#)

[Vaccine Light Sensitivity](#)

[Lyophilized \(Freeze-Dried\) Vaccines and Diluents](#)

[Vaccine Storage Locations and Positioning](#)

[Freezers](#)

[Refrigerators](#)

[Vaccine Spacing](#)

[Vaccine Packaging](#)

[Labeling](#)

[Storage Containers](#)

[Vaccine Boxes](#)

[Trays and Containers](#)

[Storage of Non-Vaccine Products](#)

[Food and Beverages](#)

[Medications and Other Biologic Products](#)

Temperature Monitoring

[Checking and Recording Temperatures at Least Twice a Day](#)

[Reviewing Temperature Logs](#)

[Noting Equipment Failures and Room Temperatures](#)

[Maintaining Temperature Logs](#)

[Using Alarm Systems](#)

Storage Troubleshooting

[Handling Inappropriate Vaccine Storage Conditions \(Light and Temperature\)](#)

[Handling Malfunctioning Vaccine Storage Units](#)

[General Instructions](#)

[Vaccine Storage Unit Is Too Warm](#)

[Vaccine Storage Unit Is Too Cold](#)

[Vaccine Storage Unit Is Too Noisy](#)

[Vaccine Storage Unit Has Stopped](#)

[Refrigerator and Freezer Door Problems](#)

[Checking the Door Seal](#)

[Adjusting the Door Seal](#)

[Adjusting Dropped Doors](#)

[Thermometer Problems](#)

[Checking Thermometer Placement](#)

[Checking If the Thermometer Works](#)

[Checking If the Thermometer Is Accurate](#)

[Power Outages](#)

[Advance Preparations](#)

[Temperature Considerations](#)

[Power Outage Procedures](#)

[Other Imminent Emergencies](#)

Selected Biologicals

[DT, Td](#)

[DTaP, DTap/Hib, DTap/HepB/IPV, Tdap](#)

[Hepatitis Vaccines: Hepatitis A, Hepatitis B, Hepatitis A/B, Hepatitis B/Hib](#)

[Hib](#)

[HPV](#)

[IPV](#)

[TIV](#)

[LAIV](#)

[MMR, MR, Measles Virus Vaccine, Mumps Virus Vaccine, Rubella Virus Vaccine](#)

[MMRV](#)

[MCV](#)

[MPSV](#)

[PCV](#)

[PPV](#)

[Rotavirus Vaccine](#)

[Varicella \(Chickenpox\) Vaccine](#)

[Zoster \(Shingles\) Vaccine](#)

Vaccine Inventory Management

[Vaccine Access](#)

[Expiration Dates](#)

[Interpreting Expiration Dates](#)

[What to Do with Expired and Mishandled Vaccine or Diluent](#)

[Exceptions to the Expiration Date](#)

[Transferring Vaccine or Diluent That Cannot Be Used Before Expiration](#)

[Expiration of Different Vaccine Products](#)

[Stock Rotation](#)

[Inventory Accounting](#)

[General Recommendations](#)

[Stock Records](#)

[Tally Sheets](#)

[Recording New Shipments](#)

[Recording Administered, Wasted, Spoiled, Expired, and Transferred Doses](#)

[Counting Stock](#)

[Vaccine Stock Calculations and Vaccine Ordering](#)

Vaccine Shipments

[Standard Operating Procedures](#)

[Receiving and Unpacking Vaccine Shipments](#)

[Receiving Vaccine Shipments](#)

[Picking Up Vaccine Shipments](#)

[Checking the Condition of a Shipment](#)

[Storing and Documenting Vaccine Shipments Upon Arrival](#)

[Transporting Vaccine to Off-Site Clinics](#)

[General Recommendations](#)

[Transporting Varicella-Containing Vaccines](#)

[Transporting Diluent](#)

[Packing Vaccine for Transport to Off-Site Clinics](#)

[Monitoring Temperatures During Off-Site Clinics](#)

[Shipping Vaccine to State Health Departments or Vaccine Manufacturers](#)

[Shipping Vaccine with a Short Expiration Date or Other Usable Vaccine](#)

[Shipping Unusable Vaccine](#)

Vaccine Preparation and Disposal

[Preparation for Vaccine Administration](#)

[Reconstitution](#)

[Definitions](#)

[Diluents](#)

[Instructions for Reconstitution](#)

[Expiration of Reconstituted Vaccine](#)

[Dating Vaccine](#)

[Use of Multidose Vials Versus Single-Dose Vials](#)

[Prefilling Syringes](#)

[Recommendation](#)

[Problems Associated with Prefilling Syringes](#)

[Influenza Clinics and Prefilling Syringes](#)

[Manufacturer-Supplied Prefilled Glass Syringes](#)

[Disposal of Vaccine and Diluent](#)