

Vaccines with Diluents: How to Use Them

The following vaccines must be reconstituted correctly before they are administered. Reconstitution means that the lyophilized (freeze-dried) vaccine powder or wafer in one vial must be reconstituted (mixed) with the diluent (liquid) in another. Only use the diluent provided by the manufacturer for that vaccine as indicated on the chart. ALWAYS check the expiration date on the diluent and vaccine. NEVER use expired diluent or vaccine.

Vaccine product name	Manufacturer	Lyophilized vaccine (powder)	Liquid diluent (may contain vaccine)	Time allowed between reconstitution and use [†]	Diluent storage environment [‡]
ACAM2000 [§] (SMA)	sanofi pasteur	ACAM2000	50% Glycerin, 0.25% phenol, sterile water	8 hrs/per day (can keep for 30 days if refrigerated)	Room temp
ActHIB (Hib)	sanofi pasteur	ActHIB	0.4% sodium chloride	24 hrs	Refrigerator
Hiberix (Hib)	GlaxoSmithKline	Hib	0.9% sodium chloride	24 hrs	Refrigerator or room temp
Imovax (RAB _{HDCV})	sanofi pasteur	Imovax	Sterile water	Immediately	Refrigerator
M-M-R II (MMR)	Merck	MMR	Sterile water	8 hrs	Refrigerator or room temp
Menomune (MPSV4)	sanofi pasteur	MPSV4	Distilled water	30 min (single-dose vial) 35 days (multi-dose vial)	Refrigerator
Menveo (MCV4)	Novartis	MenA	MenCWY	8 hrs	Refrigerator
Pentacel (DTaP-IPV/Hib)	sanofi pasteur	ActHIB	DTaP-IPV	Immediately [‡]	Refrigerator
ProQuad (MMRV)	Merck	MMRV	Sterile water	30 min	Room temp or refrigerator
RabAvert (RAB _{PCECV})	Novartis	RabAvert	Sterile water	Immediately	Refrigerator
Rotarix (RV1)*	GlaxoSmithKline	RV1	Sterile water, calcium carbonate, and xanthan*	24 hrs	Room temp
Varivax (VAR)	Merck	VAR	Sterile water	30 min	Room temp or refrigerator
YF-VAX (YF)	sanofi pasteur	YF-VAX	0.9% sodium chloride	60 min	Refrigerator
Zostavax (ZOS)	Merck	ZOS	Sterile water	30 min	Room temp or refrigerator

Always refer to the package inserts for detailed instructions on reconstituting vaccines. In general, follow these steps:

- For single-dose vaccine products (exceptions are Menomune in the multi-dose vial and Rotarix*), select a syringe and a needle of proper length to be used for both reconstitution and administration of the vaccine. Following reconstitution, Menomune in a multi-dose vial will require a new needle and syringe for each dose of vaccine to be administered. For Rotarix, see the package insert.*
- Before reconstituting, check labels on both the lyophilized vaccine vial and the diluent to verify the following:
 - that they are the correct two products to mix together
 - that the diluent is the correct volume (esp. for ACAM 2000 which comes in a 0.6 mL multi-dose vial but only 0.3mL is used for reconstitution[‡])
 - that neither vaccine nor diluent has expired
- Reconstitute (i.e. mix) vaccine *just prior to use* by
 - removing protective caps and wiping each stopper with an alcohol swab
 - inserting needle of syringe into diluent vial & withdrawing entire contents
 - injecting diluent into lyophilized vaccine vial and rotating or agitating to thoroughly dissolve the lyophilized powder
- Check the appearance of the reconstituted vaccine.
 - Reconstituted vaccine may be used if the color and appearance match the description on the package insert.
 - If there is discoloration, extraneous particulate matter, or obvious lack of resuspension, mark the vial as "DO NOT USE," return it to the proper storage conditions, and contact United States Army Medical Material Agency/Distribution Operation Center (USAMMA/ DOC) or the vaccine manufacturer.
- If reconstituted vaccine is not used immediately or comes in a multi-dose vial (i.e., multi-dose ACAM 2000),
 - clearly mark the vial with the date and time the vaccine was reconstituted
 - maintain the product at 35° – 46°F (2° - 8°C), do not freeze
 - protect live virus vaccines from light
 - use only within the time indicated on chart above

Note: Always refer to the package inserts for most recent updates for vaccine diluents.

[†] If the reconstituted vaccine is not used within this time period, it must be discarded.

[‡] Within 30 minutes or less.

* Rotarix vaccine is administered by mouth using the applicator that contains the diluent. It is not administered as an injection.

[§] Refrigerator temps should be between 35° – 46°F (2° - 8°C) and controlled room temps are between 68° - 77°F (20° - 25°C).