

What's in the childhood vaccines?

June 2024

Do you know the ingredients in the vaccines that are recommended for your child? If you don't, you cannot make an informed choice. As stated in our article on the meningitis vaccine, "Having informed consent means a person has key information needed to understand the risks and benefits of their choices."

Unfortunately, leading experts in the field of virology are either confused or less than transparent about what's really in a vaccine, so it's important for parents to inform themselves.

The CDC does publish the full list of vaccine ingredients, but it can be difficult to decipher. We've created this downloadable PDF to decode some of the most potentially concerning ingredients.

Note: The CDC says on its Excipient List, page 1, "substance used in the manufacturing of a vaccine, but not listed as contained in the final product, can be found on the package insert."

The CDC's Latest Excipient List with Annotations starts on the next page.

KEY Preservative - Preservatives prevent the growth of bacteria or fungus in vaccines.

Disinfectant - These chemicals are used to inactivate the toxins and viruses in the vaccine.

Antibiotic - Antibiotic: Used in production to prevent bacterial contamination during manufacturing.

Detergent - Chemicals that prevent viruses from clumping together in solution.

Fertilizer - Chemicals used in fertilizers are also found in vaccines. They are used as "stabilizers" and preservatives, and as part of a process to determine effectiveness, to change the acidity level.

Heavy metal - Heavy metals are used both as preservatives and to supercharge the activity of a vaccine in your body by stimulating more immune response.

Animal or insect Parts - Animal or Insect Parts: These are used as superchargers (adjuvants), stabilizers (to make the vaccine last longer on a shelf), or used to grow viruses for the vaccines.

Aborted Fetal Cells or Human parts - Aborted Fetal Cells or Human parts: Cell lines are used to grow vaccines, and it's possible DNA from the "host" line remains in the final vaccine. Albumin helps vaccines get past mucosal barriers, and can make a vaccine mixture more shelf stable. DNA can also be used to create a specific protein. Urea is used as a stabilizer.

| Vaccine (Trade Name) | Package Insert Date | Contains ^(a) |
|-----------------------------|------------------------|--|
| Adenovirus | 10/2019 | monosodium glutamate, sucrose, D-mannose, D-fructose, dextrose, human serum albumin, potassium phosphate, pladone C, anhydrous lactose, microcrystalline cellulose, polacrillin potassium, magnesium stearate, cellulose acetate phthalate, alcohol, acetone, castor oil, FD&C Yellow #6 aluminum lake dye |
| Anthrax (Biothrax) | 11/2015 | aluminum hydroxide, sodium chloride, benzethonium chloride, formaldehyde |
| BCG (Tice) | 02/2009 | glycerin, asparagine, citric acid, potassium phosphate, magnesium sulfate, iron ammonium citrate, lactose |
| Cholera (Vaxchora) | 06/2016 | ascorbic acid, hydrolyzed casein, sodium chloride, sucrose, dried lactose, sodium bicarbonate, sodium carbonate |
| Dengue (Dengvaxia) | 06/2019 | sodium chloride, essential amino acids (including L-phenylalanine), non-essential amino acids, L-arginine hydrochloride, sucrose, D-trehalose dihydrate, D-sorbitol, trometamol, urea |
| DT (Sanofi) | 06/2018 | aluminum phosphate, isotonic sodium chloride, formaldehyde |
| DTaP (Daptacel) | 01/2021 ^(b) | aluminum phosphate, formaldehyde, glutaraldehyde, 2-phenoxyethanol |
| DTaP (Infanrix) | 01/2021 ^(b) | formaldehyde, aluminum hydroxide, sodium chloride, polysorbate 80 (Tween 80) |
| DTaP-IPV (Kinrix) | 01/2021 ^(b) | formaldehyde, aluminum hydroxide, sodium chloride, polysorbate 80 (Tween 80), neomycin sulfate, polymyxin B |
| DTaP-IPV (Quadacel) | 02/2021 | formaldehyde, aluminum phosphate, 2-phenoxyethanol, polysorbate 80, glutaraldehyde, neomycin, polymyxin B sulfate, bovine serum albumin |
| DTaP-HepB-IPV (Pediarix) | 01/2021 ^(b) | formaldehyde, aluminum hydroxide, aluminum phosphate, sodium chloride, polysorbate 80 (Tween 80), neomycin sulfate, polymyxin B, yeast protein |
| DTaP-IPV/Hib (Pentacel) | 12/2019 | aluminum phosphate, polysorbate 80, sucrose, formaldehyde, glutaraldehyde, bovine serum albumin, 2-phenoxyethanol, neomycin, polymyxin B sulfate |
| DTaP-IPV-Hib-HepB (Vaxelis) | 10/2020 | polysorbate 80, formaldehyde, glutaraldehyde, bovine serum albumin, neomycin, streptomycin sulfate, polymyxin B sulfate, ammonium thiocyanate, yeast protein, aluminum |
| Ebola Zaire (ERVEBO) | 01/2021 ^(b) | Tromethamine, rice-derived recombinant human serum albumin, host cell DNA, benzonase, rice protein |
| Hib (ActHIB) | 05/2019 | sodium chloride, formaldehyde, sucrose |
| Hib (Hiberix) | 04/2018 | formaldehyde, sodium chloride, lactose |
| Hib (PevaxHIB) | 01/2021 ^(b) | amorphous aluminum hydroxyphosphate sulfate, sodium chloride |
| Hep A (Havrix) | 01/2021 ^(b) | MRC-5 cellular proteins, formalin, aluminum hydroxide, amino acid supplement, phosphate-buffered saline solution, polysorbate 20, neomycin sulfate, aminoglycoside antibiotic |
| Hep A (Vaqta) | 01/2021 ^(b) | amorphous aluminum hydroxyphosphate sulfate, non-viral protein, DNA, bovine albumin, formaldehyde, neomycin, sodium borate, sodium chloride, other process chemical residuals |
| Hep B (Engerix-B) | 01/2021 ^(b) | aluminum hydroxide, yeast protein, sodium chloride, disodium phosphate dihydrate, sodium dihydrogen phosphate dihydrate |
| Hep B (Recombivax) | 12/2018 | formaldehyde, potassium aluminum sulfate, amorphous aluminum hydroxyphosphate sulfate, yeast protein |
| Hep B (Heplisav-B) | 05/2020 | yeast protein, yeast DNA, deoxycholate, phosphorothioate linked oligodeoxynucleotide, sodium phosphate, dibasic dodecahydrate, sodium chloride, monobasic dehydrate, polysorbate 80 |
| Hep A/Hep B (Twinrix) | 01/2021 ^(b) | MRC-5 cellular proteins, formalin, aluminum phosphate, aluminum hydroxide, amino acids, sodium chloride, phosphate buffer, polysorbate 20, neomycin sulfate, yeast protein |
| HPV (Gardasil 9) | 08/2020 | amorphous aluminum hydroxyphosphate sulfate, sodium chloride, L-histidine, polysorbate 80, sodium borate, yeast protein |

| Vaccine (Trade Name) | Package Insert Date | Contains ^(a) |
|---|------------------------|---|
| Influenza (Afluria) Quadrivalent ^(c) | 03/2021 | sodium chloride, monobasic sodium phosphate, dibasic sodium phosphate, monobasic potassium phosphate, potassium chloride, calcium chloride, sodium taurodeoxycholate, ovalbumin, sucrose, neomycin sulfate, polymyxin B, beta-propiolactone, hydrocortisone, thimerosal (multi-dose vials) |
| Influenza (Fluad) Quadrivalent ^(c) | 03/2021 | squalene, polysorbate 80, sorbitan trioleate, sodium citrate dihydrate, citric acid monohydrate, neomycin, kanamycin, hydrocortisone, egg protein, formaldehyde |
| Influenza (Fluarix) Quadrivalent ^(c) | 2021 | octoxynol-10 (TRITON X-100), α -tocopheryl hydrogen succinate, polysorbate 80 (Tween 80), hydrocortisone, gentamicin sulfate, ovalbumin, formaldehyde, sodium deoxycholate, sodium phosphate-buffered isotonic sodium chloride |
| Influenza (Flublok) Quadrivalent ^(c) | 03/2021 | sodium chloride, monobasic sodium phosphate, dibasic sodium phosphate, polysorbate 20 (Tween 20), baculovirus and <i>Spodoptera frugiperda</i> cell proteins, baculovirus and cellular DNA, Triton X-100 |
| Influenza (Flucelvax) Quadrivalent ^(c) | 10/2021 ^(b) | Madin Darby Canine Kidney (MDCK) cell protein, phosphate buffered saline, protein other than HA, MDCK cell DNA, polysorbate 80, cetyltrimethylammonium bromide, and β -propiolactone, thimerosal (multi-dose vials) |
| Influenza (Flulaval) Quadrivalent ^(c) | 2021 | ovalbumin, formaldehyde, sodium deoxycholate, α -tocopheryl hydrogen succinate, polysorbate 80, phosphate-buffered saline solution |
| Influenza (Fluzone) Quadrivalent ^(c) | 2021 | formaldehyde, egg protein, octylphenol ethoxylate (Triton X-100), sodium phosphate-buffered isotonic sodium chloride solution, thimerosal (multi-dose vials) |
| Influenza (Fluzone) High Dose ^(c) | 07/2021 | egg protein, octylphenol ethoxylate (Triton X-100), sodium phosphate-buffered isotonic sodium chloride solution, formaldehyde |
| Influenza (FluMist) Quadrivalent ^(c) | 08/2021 | monosodium glutamate, hydrolyzed porcine gelatin, arginine, sucrose, dibasic potassium phosphate, monobasic potassium phosphate, ovalbumin, gentamicin sulfate, ethylenediaminetetraacetic acid (EDTA) |
| IPV (Ipol) | 01/2021 ^(b) | calf bovine serum albumin, 2-phenoxyethanol, formaldehyde, neomycin, streptomycin, polymyxin B, M-199 medium |
| Japanese Encephalitis (Ixiaro) | 09/2018 | aluminum hydroxide, protamine sulfate, formaldehyde, bovine serum albumin, host cell DNA, sodium metabisulphite, host cell protein |
| MenACWY (Menactra) | 04/2018 | sodium phosphate buffered isotonic sodium chloride solution, formaldehyde, diphtheria toxoid protein carrier |
| MenACWY (MenQuadfi) | 01/2021 ^(b) | sodium chloride, sodium acetate, formaldehyde |
| MenACWY (Menveo) | 07/2020 | formaldehyde, CRM ₁₉₇ protein |
| MenB (Bexsero) | 01/2021 ^(b) | aluminum hydroxide, sodium chloride, histidine, sucrose, kanamycin |
| MenB (Trumenba) | 2018 | polysorbate 80, aluminum phosphate, histidine buffered saline |
| MMR (MMR-II) | 12/2020 | sorbitol, sucrose, hydrolyzed gelatin, recombinant human albumin, neomycin, fetal bovine serum, WI-38 human diploid lung fibroblasts |
| MMRV (ProQuad) (Frozen: Recombinant Albumin) | 01/2021 ^(b) | MRC-5 cells including DNA and protein, sucrose, hydrolyzed gelatin, sodium chloride, sorbitol, monosodium L-glutamate, sodium phosphate dibasic, recombinant human albumin, sodium bicarbonate, potassium phosphate monobasic, potassium chloride, potassium phosphate dibasic, neomycin, bovine calf serum, other buffer and media ingredients |
| PCV13 (Pevnar 13) | 08/2017 | CRM ₁₉₇ carrier protein, polysorbate 80, succinate buffer, aluminum phosphate |
| PPSV-23 (Pneumovax) | 09/2020 | isotonic saline solution, phenol |
| Rabies (Imovax) | 10/2019 | human albumin, neomycin sulfate, phenol red, beta-propiolactone |
| Rabies (RabAvert) | 2018 | chicken protein, polygeline (processed bovine gelatin), human serum albumin, potassium glutamate, sodium EDTA, ovalbumin, neomycin, chlortetracycline, amphotericin B |
| Rotavirus (RotaTeq) | 01/2021 ^(b) | sucrose, sodium citrate, sodium phosphate monobasic monohydrate, sodium hydroxide, polysorbate 80, cell culture media, fetal bovine serum |

| Vaccine (Trade Name) | Package Insert Date | Contains ^(a) |
|--------------------------------|------------------------|---|
| Rotavirus (Rotarix) | 01/2021 ^(b) | dextran, Dulbecco's Modified Eagle Medium (sodium chloride, potassium chloride, magnesium sulfate, ferric (III) nitrate, sodium phosphate, sodium pyruvate, D-glucose, concentrated vitamin solution, L-cystine, L-tyrosine, amino acids, L-glutamine, calcium chloride, sodium hydrogenocarbonate, and phenol red), sorbitol, sucrose, calcium carbonate, sterile water, xanthan [Porcine circovirus type 1 (PCV1) is present in Rotarix. PCV-1 is not known to cause disease in humans.] |
| Smallpox (Vaccinia) (ACAM2000) | 03/2018 | HEPES, 2% human serum albumin , 0.5 - 0.7% sodium chloride USP, 5% Mannitol USP, neomycin , polymyxin B , 50% Glycerin USP, 0.25% phenol USP |
| Td (Tenivac) | 11/2019 | aluminum phosphate , formaldehyde , sodium chloride |
| Td (TDVAX) | 09/2018 | aluminum phosphate , formaldehyde , thimerosal |
| Tdap (Adacel) | 12/2020 | aluminum phosphate , formaldehyde , 2-phenoxyethanol , glutaraldehyde |
| Tdap (Boostrix) | 09/2020 | formaldehyde , aluminum hydroxide, sodium chloride, polysorbate 80 |
| Typhoid (Typhim Vi) | 03/2020 | formaldehyde , phenol, polydimethylsiloxane, disodium phosphate, monosodium phosphate, sodium chloride |
| Typhoid (Vivotif Ty21a) | 9/2013 | sucrose, ascorbic acid, amino acids, lactose, magnesium stearate, gelatin |
| Varicella (Varivax) Frozen | 01/2021 ^(b) | sucrose, hydrolyzed gelatin, sodium chloride, monosodium L-glutamate, sodium phosphate dibasic, potassium phosphate monobasic, potassium chloride, MRC-5 human diploid cells including DNA & protein , sodium phosphate monobasic, EDTA, neomycin , fetal bovine serum |
| Yellow Fever (YF-Vax) | 2/2019 | sorbitol, gelatin, sodium chloride |
| Zoster (Shingles) (Shingrix) | 01/2021 ^(b) | sucrose, sodium chloride, dioleoyl phosphatidylcholine (DOPC), 3-O-desacetyl-4'-monophosphoryl lipid A (MPL), QS-21 (a saponin purified from plant extract <i>Quillaja saponaria</i> Molina), potassium dihydrogen phosphate , cholesterol, sodium dihydrogen phosphate dihydrate , disodium phosphate anhydrous , dipotassium phosphate , polysorbate 80 , host cell protein and DNA |

Abbreviations: DT = diphtheria and tetanus toxoids; DTaP = diphtheria and tetanus toxoids and acellular pertussis; Hep A = Hepatitis A; Hep B = Hepatitis B; Hib = *Haemophilus influenzae* type b; HPV = human papillomavirus; IPV = inactivated poliovirus; LAIV = live, attenuated influenza vaccine; MenACWY = quadrivalent meningococcal conjugate vaccine; MenB = serogroup B meningococcal vaccine; MMR = measles, mumps, and rubella; MMRV = measles, mumps, rubella, varicella; PCV13 = pneumococcal conjugate vaccine; PPSV23 = pneumococcal polysaccharide vaccine; Td = tetanus and diphtheria toxoids; Tdap = tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis.

^(a)All information was extracted from manufacturers' package inserts. The date shown in the Date column of the table is the edition date of the PI in use in January 2021 by month and year. In some cases, only a year was printed on the PI. If in doubt about whether a PI has been updated since this table was prepared, check the FDA's website at:

<http://www.fda.gov/BiologicsBloodVaccines/Vaccines/ApprovedProducts/ucm093833.htm>

^(b)The PI was not dated and this is the date the PI was reviewed for this table.

^(c)All influenza vaccine in this table are 2021-22 northern hemisphere formulation.

November 2021

End of the CDC Excipient table

Definitions

Acetone - solvent used in fingernail polish remover

Aluminum - heavy metal, adjuvant

Aluminum hydroxide - medication used in the management and treatment of acid indigestion

Aluminum phosphate - chemical compound synthetic form of aluminum

Ammonium thiocyanate - chemical compound of cyanide, used in fertilizer

Amorphous aluminum hydroxyphosphate sulfate - a form of an aluminum adjuvant

Aminoglycoside antibiotic - antibiotic

Amphotericin B - antifungal medication

Baculovirus and cellular DNA - viruses limited to specific invertebrate species, especially insects

Benzethonium chloride - ammonium salt, it is an antiseptic and disinfectant

Bovine albumin - protein derived from bovine blood plasma

Bovine serum albumen / Bovine calf serum - liquid portion of cow blood

Bovine casein / Bovine extract / Bovine caseation acids - cow protein

B-propiolactone (Beta-propiolactone) - disinfecting agent

Cholesterol - a waxy, fat-like substance that is found in all cells of the body

Chlortetracycline - antibiotic

Cetyltrimethylammonium bromide - detergent

Deoxycholate - detergent

Dibasic dodecahydrate - laxative

Dibasic sodium phosphate - a thickener; laxative

Dipotassium Phosphate - used in fertilizers

Disodium phosphate anhydrous - preservative

DNA - genetic material derived from cells like CHO or HEK293, which are aborted fetal cells

Dulbecco's Modified Eagle Medium - growth hormone

Egg protein - egg protein

Fetal bovine serum - derived from the blood drawn from a bovine fetus

Formaldehyde - colorless poisonous gas used as an antiseptic, disinfectant; preservative

Formalin - disinfectant

Gentamicin - antibiotic

Glucose - chemical compound that has the ability to cross the blood-brain barrier

Glutaraldehyde - disinfectant; chemical preservative

Host cell DNA - genetic material derived from cells like CHO or HEK293, which are aborted fetal cells

Human serum albumin - protein found in human blood

Hydrocortisone - another name for the hormone cortisol

Hydrolyzed casein - milk proteins

Kanamycin - antibiotic

Madin Darby Canine Kidney (MDCK) cell protein - canine derived cell protein

Magnesium stearate - lubricant

MDCK Cell DNA - canine derived cell line

Monosodium glutamate (MSG) - preservative

Definitions (cont.)

MRC-5 - aborted fetal cells

Neomycin - antibiotic

Octylphenol ethorylate - detergent

Octoxynol-10 - cleansing agent

Ovalbumin - egg protein

Phenol - was first extracted from coal tar, but today is produced from petroleum-derived feedstocks

Polydimethylsiloxane - lubricant

Polymyxin B - antibiotic

Polysorbate 20 - detergent

Polysorbate 80 (tween80) - emulsifier and detergent, a chemical compound that has the ability to cross the blood-brain barrier

Potassium aluminum sulfate - combination of potassium, aluminum, and sulfur; used for flame resistance

Potassium dihydrogen phosphate - used in fertilizers

Potassium phosphate monobasic - used in fertilizers

Sodium chloride - table salt

Sodium deoxycholate - detergent

Sodium pyruvate - a chemical compound that has the ability to cross the blood-brain barrier

Sodium taurochenodeoxycholate - detergent

Sorbitol - used as a laxative

Sorbitan trioleate - helps create MF59 adjuvant with squalene inside of it

Spodoptera frugiperda cell proteins - from armyworm moths

Squalene - oil frequently harvested from the liver of sharks

Streptomycin - antibiotic

Thimerosal - mercury-based preservative

Trinton X-100 - detergent

Urea - organic compound found in the human body that can be used in small quantities as a stabilizer in vaccines

WI-38 - aborted fetal cells

2-Phenoxyethanol - a chemical preservative