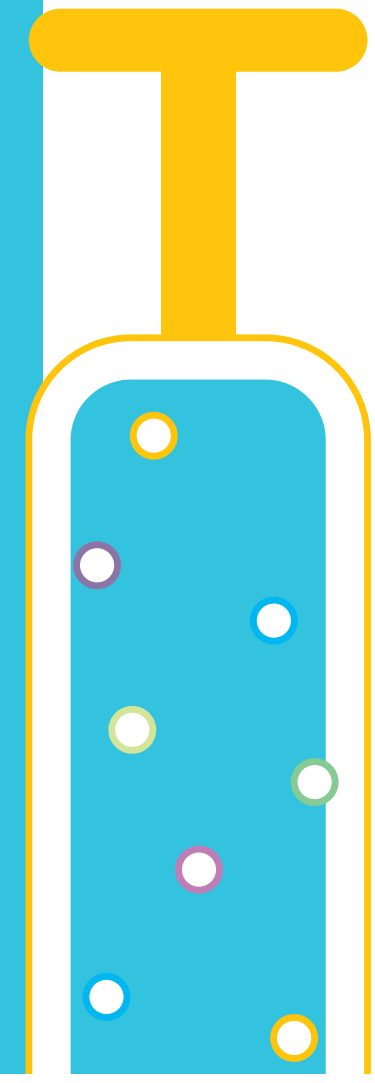
What is in vaccines?

All ingredients in vaccines are tested for safety

The most important part of a vaccine is the antigen. Other ingredients include adjuvants, preservatives, stabilisers and diluents. Some of these are added to protect and support the antigen. Tiny traces of substances used in the process of producing antigens can also be detected in vaccines (residues).

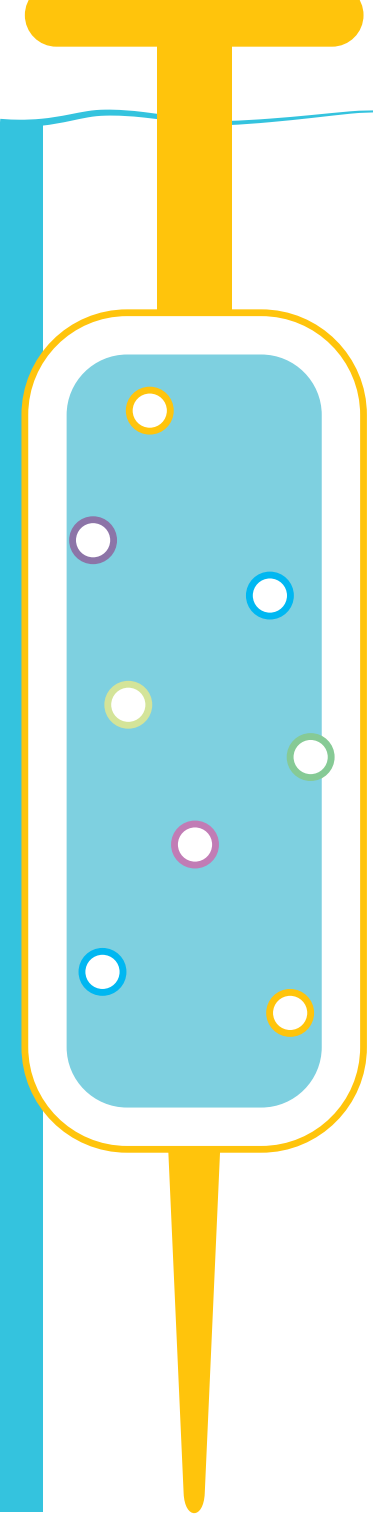


Antigens

Antigens train the immune system to clear disease-causing germs (bacteria or viruses) from the body quickly, before they can cause serious illnesses. Most antigens are fragments of germs. Some antigens are weakened or killed germs or substances made by germs, called toxins. Combination vaccines, given in a single needle, contain more than one antigen, which reduces the number of needles children need to be fully protected.

Adjuvants

Adjuvants help strengthen the immune system's response to the antigens in vaccines. In some cases this means fewer needles are needed for a child to be fully protected against a disease. The most commonly used adjuvants are salts called aluminium hydroxide, aluminium sulphate and potassium aluminium sulphate. They are commonly referred to as 'alum'. The amount of aluminium contained in vaccines is tiny compared with the amount found naturally in other things children consume, such as breastmilk or formula milk.



Preservatives

Preservatives protect vaccines from becoming contaminated with harmful bacteria or fungi. The most common preservative used in vaccines is a tiny amount of alcohol. Thiomersal, which is a salt that contains a tiny amount of mercury, is no longer used as a preservative in any vaccines routinely given to children in Australia. It is used in some other parts of the world because it is safe and effective as a preservative.

Stabilisers

Stabilisers are usually sugars or oils that prevent vaccines from going off or sticking to the sides of their containers or syringes.

Residues

Residues are tiny amounts of substances that remain in the vaccine after the manufacturing process. Most of these substances are removed from the final vaccine product, but small amounts remain. In such miniscule amounts, these residues are harmless and most are already present in our bodies. For example, tiny traces of formaldehyde can be detected in some vaccines. Formaldehyde is used to inactivate viruses so they can be safely used as antigens in vaccines. Much larger amounts of formaldehyde are produced naturally in healthy human bodies than can be detected in vaccines.[1]

Diluents

The diluent used in vaccines is usually sterile water or saline (salt water). Diluents have no effect on the body. They are included in vaccines to ensure that the smallest useful dose can be given to children. Vaccines are mostly made up of water or saline.

About us

This fast fact sheet has been developed to help doctors and nurses to answer parents' questions about vaccinations by a group of researchers called the SARAH Collaboration. It was written by Nina Berry PhD and Julie Leask PhD from the University of Sydney, Margie Danchin PhD from the University of Melbourne, Tom Snelling PhD from the Telethon Kids Institute, and Kristine Macartney MD and Melina Georgousakis PhD from NCIRS. SARAH is funded by the Australian Government Department of Health.

Further reading

www.science.org.au/immunisation
www.ncirs.edu.au/provider-resources/ncirs-fact-sheets
www.immunise.health.gov.au

References

1. www.fda.gov/BiologicsBloodVaccines/SafetyAvailability/VaccineSafety

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