Adjuvant Safety: Table of Evidence

Citation	Methods	Participants	Outcomes
Andrews, N., Miller, E., Grant, A., Stowe, J., Osborne, V., & Taylor, B. (2004). Thimerosal exposure in infants and developmental disorders: a retrospective cohort study in the United Kingdom does not support a causal association. *Pediatrics*, *114*(3), 584-591.	Scientists in England studied children who were exposed to thimerosal (ethylmercury) to see if this impaired cognitive development in children.	14,000 children who were exposed to thimerosal. Information on vaccination was collected from the government, and behavioral outcomes were examined.	The authors found "no convincing evidence that early exposure to thimerosal had any deleterious effect on neurologic or psychological outcome when given according to an accelerated schedule."
1763-1766. Hviid, A., Stellfeld, M., Wohlfahrt, J., & Melbye, M. (2003). Association between thimerosal-containing vaccine and autism. Jama, 290(13),	Researchers in Denmark evaluated whether thimerosal-containing vaccines were associated with the development in autism.	All children (467,450) born in Denmark between 1990 and 1996. Some children received thimerosal-containing vaccines, and some did not.	The authors found no association between the vaccines given, and the autism rate in Denmark.
Taylor, L. E., Swerdfeger, A. L., & Eslick, G. D. (2014). Vaccines are not associated with autism: an evidence-based meta-analysis of case-control and cohort studies. Vaccine, 32(29), 3623-3629.	A meta-analysis by researchers sought to analyze connections between mercury and autism rates.	1,300,000 children across several studies	They found no association between components of the vaccines (thimerosal or mercury) or multiple vaccines (MMR) and the development of autism.
Uno, Y., Uchiyama, T., Kurosawa, M., Aleksic, B., & Ozaki, N. (2015). Early exposure to the combined measles–mumps–rubella vaccine and thimerosal-containing vaccines and risk of autism spectrum disorder. *Vaccine*, *33*(21), 2511-2516.	Japanese researchers searched for a correlation between thimerosal-containing vaccines and autism rates.	They compared 189 children with autism to 189 children without autism and collected their vaccination history.	They found no association between the vaccines given and the autism diagnoses.
Burbacher, T. M., Shen, D. D., Liberato, N.,	To compare excretion and	41 monkeys were given injections of	Methylmercury accumulated in the blood

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Grant, K. S., Cernichiari, E., & Clarkson, T. (2005). Comparison of blood and brain mercury levels in infant monkeys exposed to methylmercury or vaccines containing thimerosal. *Environmental health perspectives*, *113*(8), 1015.	clearance of ethylmercury and methylmercury.	either methyl mercury (which is neurotoxic) and ethyl mercury, which used to be in vaccines (which is NOT neurotoxic).	and remained detectable 28 days after the last dose. Ethylmercury levels dropped quickly between doses. Ethylmercury cleared the body 5.4x faster than methylmercury. Brain concentrations of total mercury were 3–4x lower in the ethylmercury group than in the methylmercury group.
Karwowski, M. P., Stamoulis, C., Wenren, L. M., Faboyede, G. M., Quinn, N., Gura, K. M., ... & Woolf, A. D. (2018). Blood and hair aluminum levels, vaccine history, and early infant development: A cross-sectional study.*Academic pediatrics*,*18*(2), 161-165.	To evaluate relationships between aluminum levels in blood and hair in healthy infants and their immunization history and development.	Analyzed data for 85 infants for whom information was obtained on aluminum levels as well as on neurodevelopment. Vaccine-related aluminum load for each subject was calculated from medical records, published data on vaccine aluminum content.	Infant blood aluminum and hair aluminum varied considerably but did not correlate with their immunization history. Likewise, there was no correlation between blood aluminum and infant development or between hair aluminum and language or cognitive development.
Keith, L. S., Jones, D. E., & Chou, C. H. (2002). Aluminum toxicokinetics regarding infant diet and vaccinations. *Vaccine*,*20*, S13-S17.	The pharmacokinetic properties and end-point toxicities of aluminum were presented. Infant body burdens for breast milk and formula diets and for a standard vaccination schedule are estimated.	Researchers compared those body burdens with that expected for intake at a level considered safe for intermediate-duration exposure.	The calculated body burden of aluminum from vaccinations is below the minimal risk level following injection. Aluminum was injected into a human volunteer and blood aluminum levels were found to decrease by>50% in 15 min and by>99% in 2 days.
Jefferson, T., Rudin, M., & Di Pietrantonj, C. (2004). Adverse events after immunisation with aluminium-containing DTP vaccines: systematic review of the evidence. *The Lancet infectious diseases*, *4*(2), 84-90.	A systematic review of adverse events after exposure to aluminum-containing DTP vaccines, compared with vaccines that either did not contain aluminum or had them in different concentrations.	Reference lists of all relevant articles obtained and any published reviews were examined for additional studies. The Vaccine Adverse Event Reporting System website was accessed Dec 10, 2003.	In younger children, the addition of aluminum caused more redness and swelling at injection site.The children who received aluminum containing vaccines experienced significantly fewer reactions of all types than vaccines without aluminum.