Type of Vaccine	Information	Manufacture	Pros	Cons	Vaccines of this type
Live Attenuated	• Live, but weak ➢ Too weak to cause disease ➢ Still provoke immune response to provide long-term, specific immunity	• Virus passed through a series of cell cultures ➢ Up to 200 times ➢ Often chick embryos • Virus adapts to chicken cells, but loses ability to cause disease in human cells • Virus then used to produce vaccine	Longer lasting immunity than other vaccine types	Can sometimes (very rarely) revert and cause disease	Measles Mumps Rubella (German Measles) Varicella (Chicken Pox) Oral Polio Vaccine Rotavirus
Killed/Inactivated	• Pathogen killed /inactivated by heat or chemicals ➢ Can no longer cause disease ➢ Retains antigenic sites so still provokes immune response • "Killed" – bacteria • "Inactivated" - viruses	• Pathogen inactivated/killed by heat or chemicals and then used to manufacture vaccine	Cannot cause disease – it's dead.	Shorter duration of immunity than live vaccines – needs more boosters.	Pertussis (Whooping Cough) Inactivated Polio Vaccine Typhoid Some Influenza Vaccines
Toxoid	• Works to stimulate immunity to a toxin produced by the pathogen	• Toxin inactivated by heat or chemicals, but still retains antigenic sites so can still provoke an immune response	Protects from diseases where toxins are produced		Tetanus Diphtheria
Subunit/Conjugate	• Use part of pathogen containing antigenic site rather than whole pathogen	• Gene coding for antigenic site inserted into harmless virus, used to make vaccine • Or part of pathogen isolated to make vaccine	Cannot cause disease		Acellular Pertussis (whooping cough) Human Papilloma Virus (HPV) Pneumococcal Hepatitis B