



Booster Dose: Corbevax

For Prelims: Vaccines and types, Corbevax, Spike Protein

For Mains: Mechanism of Vaccine in treating viral infection, Types of Vaccines

Why in News?

Recently, the government of India announced that those who have received [Covishield](#) or Covaxin as their first or second dose for [Covid-19](#) can take **Corbevax as the third booster shot**.

- Corbevax is still awaiting [World Health Organisation's Emergency Use Listing \(EUL\)](#).
- Until now, the third dose **had to be the same vaccine** that was used for the first and second doses.
- The decision comes after [India's drug regulator](#) approved Corbevax as a **heterologous Covid booster dose** for individuals aged 18 years.

What is WHO's Emergency Use Listing (EUL)?

- EUL is a **risk-based procedure** for **assessing and listing** unlicensed vaccines, therapeutics and in-vitro diagnostics with the ultimate aim of **expediting the availability of products to people** affected by a [public health emergency](#).
- **International travel in many countries** requires people to get a vaccine that's on the **WHO's approved list**.

What do we know about the Corbevax Vaccine?

- **About:**
 - Corbevax is India's first **indigenously developed Receptor Binding Domain (RBD) protein sub-unit vaccine** against Covid, **with two doses scheduled 28 days apart**.
 - It can be **stored at 2-8 degrees Celsius**, which is best suited for India's requirements.
- **Working Process:**
 - Corbevax is a **"recombinant protein sub-unit"** vaccine, which means it is made up of a **specific part of SARS-CoV-2: the spike protein on the virus's surface**.
 - The **spike protein allows the virus to enter the cells** in the body so that it can **replicate and cause disease**.
 - However, when this **protein alone is given to the body**, it is not expected to be harmful as **the rest of the virus is absent**.
 - The body is **expected to develop an immune response against the injected spike protein**.
 - Once the [human immune system](#) recognises the protein, it produces [antibodies](#) as [white blood cells](#) to fight the infection.

- Therefore, when the **real virus attempts to infect the body**, it will **already have an immune response ready** that will make it **unlikely for the person to fall severely ill**.

What are other types of Vaccines?

- **Inactivated vaccines:**
 - **Inactivated vaccines** use the **killed version of the germ that causes a disease**.
 - Vaccines of this type are created by **inactivating a pathogen, typically using heat or chemicals such as formaldehyde or formalin**.
 - This destroys the **pathogen's ability to replicate**, but keeps it **"intact"** so that the **immune system can still recognize it**. ("Inactivated" is generally used rather than "killed" to refer to viral vaccines of this type, as viruses are generally not considered to be alive.)
- **Live-attenuated Vaccines:**
 - Live vaccines use a **weakened (or attenuated) form of the germ that causes a disease**.
 - Because these vaccines are so similar to the natural infection that they help prevent, **they create a strong and long-lasting immune response**.
- **Messenger (m) RNA Vaccines:**
 - mRNA vaccines make proteins in order to **trigger an immune response**. mRNA vaccines have **several benefits compared to other types of vaccines**, including **shorter manufacturing times**, because they do not contain a live virus, **no risk of causing disease in the person getting vaccinated**.
 - The vaccines are used to protect against: Covid-19.
- **Toxoid Vaccines:**
 - They use a **toxin (harmful product) made by the germ that causes a disease**.
 - They **create immunity to the parts of the germ that cause a disease** instead of the germ itself. That means the **immune response is targeted to the toxin instead of the whole germ**.
- **Viral Vector Vaccines:**
 - Viral vector vaccines use a **modified version of a different virus** as a vector to deliver protection.
 - Several different viruses have been used as vectors, including **influenza, vesicular stomatitis virus (VSV), measles virus, and adenovirus**, which causes the common cold.

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Prelims

Q. With reference to recent developments regarding 'Recombinant Vector Vaccines', consider the following statements: (2021)

1. Genetic engineering is applied in the development of these vaccines.
2. Bacteria and viruses are used as vectors.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Ans: (c)

Explanation:

- Recombinant vector vaccines are made through genetic engineering. The gene that creates the

protein for a bacteria or virus is isolated and placed inside another cell's genes. When that cell reproduces, it produces vaccine proteins that mean the immune system will recognize the protein and protect the body against it. Hence, statement 1 is correct.

- Live recombinant bacteria or viral vectors effectively stimulate the immune system as in natural infections and have intrinsic adjuvant properties. They are used as the channel for the entry into the host organism.
 - Several bacteria have been used as vectors, such as *Mycobacterium bovis* BCG, *Listeria monocytogenes*, *Salmonella* spp. and *Shigella* spp.
 - Numerous viral vectors are available for vaccine development, such as vaccinia, modified vaccinia virus Ankara, adenovirus, adeno-associated virus, retrovirus/lentivirus, alphavirus, herpes virus, etc. Hence, statement 2 is correct.
- **Therefore, option (c) is the correct answer.**

Mains

Q. COVID-19 pandemic has caused unprecedented devastation worldwide. However, technological advancements are being availed readily to win over the crisis. Give an account of how technology was sought to aid management of the pandemic. **(2020)**

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