



# Questions on Immunization and Vaccination and Short Answers

## Bağışıklama ve Aşı ile İlgili Sorular ve Kısa Cevaplar

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*Streptococcus pneumoniae* is the leading cause of infections that cause morbidity and mortality in both children and adults, particularly those over the age of 65. Acute otitis media is a common outpatient diagnosis in children and one of the primary drivers for antibiotic use (1,2). According to a recently published study in the United States which evaluated hospital admissions, there were 20.800 otitis incidents per 100.000 people aged 18 and under in 2018 (3). Although this figure gives an idea about its prevalence, it increases even more at younger ages. In another study conducted in the United States, *Streptococcus pneumoniae* was detected in 24% of 319 cases of acute otitis (4). As with acute otitis media, one of the most common causes of bacterial pneumonia in all age groups is *Streptococcus pneumoniae*. Similarly, in a 2014 study of hospital admissions in the United States, it was discovered that pneumonia was responsible for 1280 to 3990 hospitalizations per 100.000 people (5). Furthermore, in the year preceding the pandemic, from 2018 to 2019, 87 to 680 hospitalizations occurred due to pneumonia in every 100.000 people (6). Invasive diseases caused by *Streptococcus pneumoniae* were found with a frequency of 7.2 in children under the age of five and 1.5 in children aged five to eighteen out of every 100.000 people (7,8). All of these statistics indicate how dangerous pneumococcus is to humans and how important pneumococcal vaccines are to human health. The reduction in antibiotic use with pneumococcal vaccines, as well as the possibility of using antibiotics with a narrower spectrum, provide significant advantages in preventing the development

of antibiotic resistance and in the rational use of antibiotics. For this reason, we wanted to share a brief Q&A about pneumococcal vaccines in this issue.

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**Question 1:** How should pneumococcal vaccines be given? Can they be administered subcutaneously?

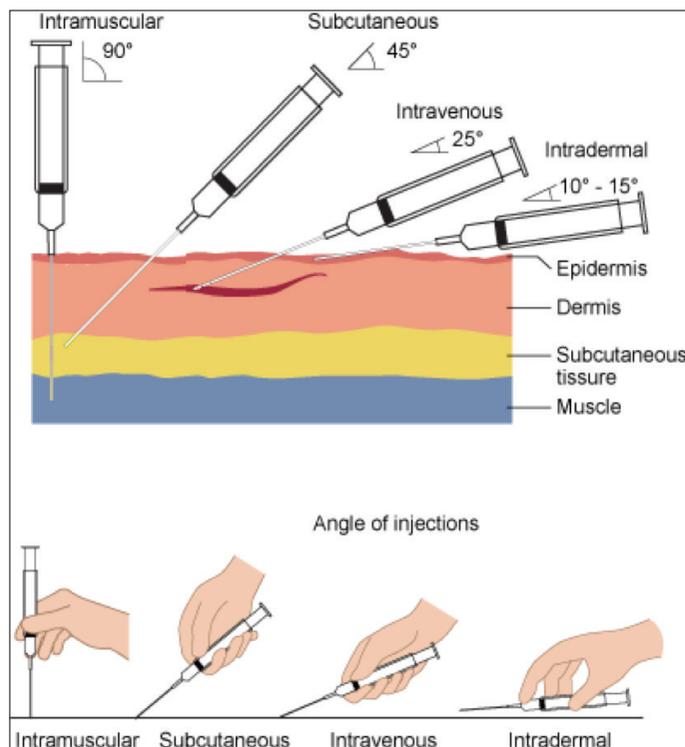
**Answer 1:** Polysaccharide pneumococcal vaccines (23 valent polysaccharide pneumococcal vaccines Pneumovax and Pneumo23) can be administered intramuscularly or subcutaneously. However, intramuscular injection is the preferred method of administration. Conjugated pneumococcal vaccines on the other hand, should be administered intramuscularly. The vastus lateralis muscle, located on the anterolateral portion of the thigh, is the preferred anatomical site for injection in newborns and infants. In older children, particularly toddlers, it is better to inject into the deltoid muscle, if there is sufficient muscle mass.

Since the subcutaneous region has significantly less blood supply, it may cause slower distribution of the vaccine, allowing for higher response.

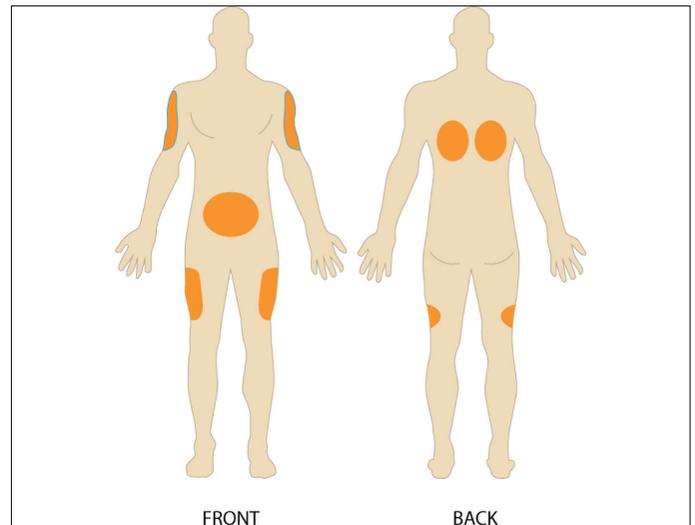
The angle of the injection varies according to the site of administration. The angle of the syringe is shown in Figure 1 and the anatomical sites for subcutaneous injection are shown in Figure 2 (Source: [https://en.wikipedia.org/wiki/Subcutaneous\\_injection](https://en.wikipedia.org/wiki/Subcutaneous_injection) Accessed September 2022).

**Question 2:** What is the recommendation for pneumococcal vaccine in the national vaccination schedule?

**Answer 2:** According to the national vaccination calendar, the 13-valent Prevnar-13 conjugated pneumococcal vaccine is administered using the 2+1 scheme, with two doses at 2<sup>nd</sup> and



**Figure 1.** The angle of entry of the syringe.



**Figure 2.** Anatomical sites for subcutaneous injection.

4<sup>th</sup> months followed by a booster dose at 12<sup>th</sup> month. However, in the presence of risk factors or for children with possible risk factors, the 3+1 scheme is applied, where three doses are administered at 2<sup>nd</sup>, 4<sup>th</sup> and 6<sup>th</sup> months, followed by a booster dose at 12<sup>th</sup> month. Immunodeficiency, CSF leak, cochlear implant can be defined as risk factors.

In children older than seven months and younger than 12 months who have not previously received pneumococcal vaccine, the injections are given at least four weeks apart for the first two doses (four weeks is the shortest preferred time to establish the already delayed protection as soon as possible). The booster dose should be given between 12<sup>th</sup> and 15<sup>th</sup> months, eight weeks after the last dose at the earliest.

Similarly, children older than 12 months and younger than 24 months who have not previously been immunized should receive two doses of conjugated pneumococcal vaccine, with at least eight weeks between doses.

For children older than 24 months and younger than 72 months, a single dose of pneumococcal conjugated vaccine is sufficient if they have not been vaccinated before. However, in the presence of any risk factors, two doses of conjugated pneumococcal vaccine should be administered, with at least eight weeks between the doses.

Children and adolescents older than six years and younger than 18 years of age with risk factors (for example, immunodeficiency, cochlear implant, or CSF leak) should be given one dose of 13-valent pneumococcal conjugated vaccine even if they have previously received a 7-valent or 10-valent pneumococcal vaccine or a 23-valent polysaccharide pneumococcal vaccine. There should be at least eight weeks between doses. Children and adolescents older than two years old who have risk factors and have not previously received the polysaccharide pneumococcal vaccine should also receive one dose of the 23-valent pneumococcal vaccine, at least eight weeks after the final conjugated pneumococcal vaccination.