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Special Article

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Pneumococcal Vaccination in Korean Adults: 2025 Recommendations by the Korean Society of Infectious Diseases

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ABSTRACT

The 20-valent pneumococcal conjugate vaccine (PCV20) was approved by the Korean Ministry of Food and Drug Safety in October 2024. Despite the ongoing national immunization programs that include pneumococcal conjugate vaccines for children and 23-valent pneumococcal polysaccharide vaccine (PPSV23) for adults, the burden of invasive pneumococcal disease and pneumococcal community-acquired pneumonia remains high among the elderly and high-risk adults. Serotypes 3 and 19A, both included in 13-valent pneumococcal conjugate vaccine (PCV13), continue to be the most prevalent serotypes, and infections caused by non-PCV13 serotypes have increased. Given the need to broaden serotype coverage and simplify vaccination strategies, the Korean Society of Infectious Diseases recommends either a single dose of PCV20 or sequential vaccination with 15-valent pneumococcal conjugate vaccine followed by PPSV23 for adults aged 65 years and older, and for high-risk adults aged 19–64 years. These recommendations are based on immunogenicity, safety, and cost-effectiveness data from recent clinical trials. Vaccine selection, dosing intervals, and schedules should be determined according to individual underlying medical conditions and previous vaccination history to optimize protection against pneumococcal disease in the adult population.

Keywords: Pneumococcal vaccine; Adult; Immunization; Invasive pneumococcal disease

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SUMMARY OF RECOMMENDATIONS

1. For adults aged 65 years and older, and high-risk adults aged 19–64 years (including those with chronic medical conditions, specified immunocompromising conditions, cerebrospinal fluid leaks or cochlear implants), it is recommended to administer either a single dose of the 20-valent pneumococcal conjugate vaccine (PCV20) or sequential vaccination with the 15-valent pneumococcal conjugate vaccine (PCV15) followed by the 23-valent pneumococcal polysaccharide vaccine (PPSV23).
2. The choice of vaccine, dosing intervals, and vaccination schedule should be determined based on underlying conditions and prior vaccination history, as outlined in Tables 2 and 4 of the main text.

On October 31, 2024, the 20-valent pneumococcal conjugate vaccine (PCV20) was approved by the Korean Ministry of Food and Drug Safety [1]. Currently, there are four pneumococcal vaccines available for adult use in Korea: the 13-valent pneumococcal conjugate vaccine (PCV13), the 15-valent pneumococcal conjugate vaccine (PCV15), the 20-valent pneumococcal conjugate vaccine (PCV20), and the 23-valent pneumococcal polysaccharide vaccine (PPSV23). The serotype distribution of each pneumococcal vaccine is presented in **Table 1**. Based on the serotype distribution of invasive pneumococcal disease (IPD) among Korean adults, the proportions covered by PCV13, PCV15, PCV20, and PPSV23 are 31.9%, 36.2%, 54.3%, and 58.6%, respectively, while non-vaccine serotypes accounted for 41.4% during the period from 2019 to 2021 [2].

Despite the implementation of national immunization programs since 2013—administering pneumococcal conjugate vaccines to children (with a coverage rate of approximately 97% in 2023) and PPSV23 to adults aged 65 and older (with a 54.5% coverage rate in 2022)—the disease burden of invasive pneumococcal disease and pneumococcal community-acquired pneumonia remains high, particularly among the elderly and high-risk groups [3-5]. Furthermore, serotypes 3 and 19A, both included in PCV13, continue to be the most prevalent among adults in Korea. The indirect effects of pediatric conjugate vaccination and the preventive efficacy of PPSV23 in adults aged 65 and older are considered insufficient. Given the increasing proportion of infections caused by serotypes not included in PCV13, there is a strong need to actively promote the administration of conjugate vaccines with expanded serotype coverage among adults [2, 4, 5].

According to the pneumococcal vaccination recommendations for adults aged 19 and older announced by the United State Advisory Committee on Immunization Practices (ACIP) in September 2023, adults are categorized into two groups: those aged 65 and older, and those aged 19–64 with underlying medical conditions. Based on prior vaccination history and underlying conditions, a single dose of PCV20 or sequential vaccination with PCV15 followed by PPSV23 is recommended, along with additional PPSV23 doses according to revaccination timing in **Table 2** [6]. These recommendations were based on clinical trial data regarding immunogenicity and safety, as well as cost-effectiveness analyses [6]. **Table 3** outlines the differences between a single dose of PCV20 vaccination and sequential PCV15+PPSV23 vaccinations. The ACIP has recently added 21-valent pneumococcal conjugate vaccine (PCV21) as an additional option, and expanded the vaccination target population by lowering the recommended age from 65 to 50 years [7, 8]. PCV21 has not yet been introduced in South Korea, and due to insufficient evidence to lower the recommended age to 50, we have maintained the age criterion of 65 years and older. Similar to our recommendations, Canada recommends either a single dose of PCV20 or sequential vaccination with PCV15 followed by PPSV23 [9]. Australia maintains one of the highest age thresholds

Table 1. Serotype composition of pneumococcal vaccines

Vaccine	Serotypes																							
	1	3	4	5	6A	6B	7F	9V	14	18C	19A	19F	23F	22F	33F	8	10A	11A	12F	15B	2	9N	17F	20
PCV13	■	■	■	■	■	■	■	■	■	■	■	■	■											
PCV15	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■									
PCV20	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
PPSV23	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

The purple-shaded columns represent the serotypes contained in each vaccine formulation.
PCV13, 13-valent pneumococcal conjugate vaccine; PCV15, 15-valent pneumococcal conjugate vaccine; PCV20, 20-valent pneumococcal conjugate vaccine; PPSV23, 23-valent pneumococcal polysaccharide vaccine.

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Table 2. Recommended pneumococcal vaccines and vaccination schedules for adults aged 19 and older by risk group

Risk group	Vaccine type	Dosing intervals and timing for sequential PCV15[a]+PPSV23			
		Interval for PCV15[a] → PPSV23	Interval for PPSV23 → PCV15[a]	Timing for PPSV23 revaccination	Maximum number of PPSV23 doses
Healthy adults aged ≥65 years	Single dose of PCV20 or sequential PCV15+PPSV23	≥1 year	≥1 year	No need for revaccination	1 dose
Adults with chronic medical conditions[b]	Single dose of PCV20 or sequential PCV15+PPSV23	≥1 year	≥1 year	5 years after the previous dose and the age of 65	2 doses (final dose after age 65[c])
Adults with a cerebrospinal fluid leak or a cochlear implant	Single dose of PCV20 or sequential PCV15+PPSV23	≥8 weeks	≥1 year	5 years after the previous dose and age of 65	2 doses (final dose after age 65[c])
Specified immunocompromising conditions[d]	Single dose of PCV20 or sequential PCV15+PPSV23	≥8 weeks	≥1 year	5 years after the previous dose; if before 65, an additional dose 5 years after the age of 65	3 doses (final dose after age 65[c])

[a]If PCV15 is not available, PCV13 may be used instead.
[b]Alcoholism; chronic heart disease, including congestive heart failure and cardiomyopathies; chronic liver disease; chronic lung disease, including chronic obstructive pulmonary disease, emphysema, and asthma; cigarette smoking; or diabetes mellitus.
[c]The notation 'final dose after age 65' indicates that one additional PPSV23 dose should be administered 5 years after reaching age 65, regardless of previous PPSV23 vaccination history before age 65.
[d]Chronic renal failure congenital or acquired asplenia, congenital or acquired immunodeficiency (including B-[humoral] or T-lymphocyte deficiency, complement deficiencies [particularly C1, C2, C3, and C4 deficiencies], and phagocytic disorders [excluding chronic granulomatous disease]), generalized malignancy, HIV infection, Hodgkin disease, iatrogenic immunosuppression (including disease requiring treatment with immunosuppressive drugs such as long-term systemic corticosteroids and radiation therapy), leukemia, lymphoma, multiple myeloma, nephrotic syndrome, sickle cell disease and other hemoglobinopathies, and solid organ transplant. Excludes persons with a hematopoietic stem cell transplant.
PCV15, 15-valent pneumococcal conjugate vaccine; PPSV23, 23-valent pneumococcal polysaccharide vaccine; PCV20, 20-valent pneumococcal conjugate vaccine.

Table 3. Comparison between single-dose PCV20 and sequential PCV15 followed by PPSV23

Comparison items	Single-dose of PCV20	Sequential PCV15+PPSV23
Serotype range	20 serotypes	24 serotypes
Immunogenicity	Demonstrated non-inferiority compared to PCV13 and PPSV23; data in immunocompromised populations are limited	PCV15 showed superiority over PCV13 for serotypes 3, 22F, and 33F; potentially lower effectiveness for PPSV23-only serotypes not included in PCV15 (2, 8, 9N, 10A, 11A, 12F, 15B, 17F, 20)
Safety	No difference compared to PCV13 and PPSV23	No difference compared to PCV13 and PPSV23
Cost-effectiveness	More cost-effective than PCV13+PPSV23	Cost-effective compared to PCV13+PPSV23, but may vary depending on specific conditions
Vaccination schedule	Simple, single dose	Complex, multiple combination doses are required

PCV20, 20-valent pneumococcal conjugate vaccine; PCV15, 15-valent pneumococcal conjugate vaccine; PPSV23, 23-valent pneumococcal polysaccharide vaccine; PCV13, 13-valent pneumococcal conjugate vaccine.

at 70 years for non-Indigenous adults, while European countries show considerable heterogeneity in their approaches [10, 11].

In a phase 3 clinical trial conducted in Korea, Japan, and Taiwan among adults aged 60 and older, PCV20 demonstrated non-inferiority immunogenicity compared to PCV13+PPSV23 across 19 serotypes, and the safety profiles were comparable [12]. A cost-effectiveness analysis comparing a single dose of PCV20 with a single dose of PPSV23, which is currently provided through the national immunization program for Korean adults aged 65 and older, found that the incremental cost-effectiveness ratio for PCV20 was 2,677 USD per quality-adjusted life year (QALY), which is lower than Korea's willingness-to-pay threshold of 16,824 USD/QALY, indicating that PCV20 vaccination is cost-effective [13]. However, vaccine price was identified as the most influential factor affecting the cost-effectiveness analysis, meaning that future results could vary depending on the final pricing of PCV20.

Despite the implementation of a national immunization program administering pneumococcal conjugate vaccines to children and PPSV23 to adults, the disease burden of invasive pneumococcal disease and pneumococcal community-acquired pneumonia remains high among the elderly and high-risk groups. Given the continued predominance of serotypes 3 and 19A included in PCV13, the clinical trial results of PCV15 and PCV20, and the need to simplify pneumococcal vaccination schedules for adults, the Adult Immunization Committee

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Table 4. Pneumococcal vaccine recommendations based on prior vaccination status for high-risk groups[a]

Pneumococcal vaccination history	Vaccination recommendation
Unvaccinated	Single dose of PCV20 or sequential PCV15[b]+PPSV23[c]
Prior PCV13 vaccination	Single dose of PCV20 or sequential PPSV23 vaccination[c] after 1 year
Prior PCV15 vaccination	Sequential PPSV23 vaccination[c]
Prior PPSV23 vaccination	Single dose of PCV20 or sequential PCV15[b]+PPSV23[c] after 1 year
Prior PCV13+PPSV23 vaccination	Single dose of PCV20 or sequential PPSV23 vaccination[c] after 5 years
Prior PCV15+PPSV23 vaccination	Sequential PPSV23 vaccination[c]

[a]Chronic renal failure, congenital or acquired asplenia, congenital or acquired immunodeficiency (including B-[humoral] or T-lymphocyte deficiency, complement deficiencies [particularly C1, C2, C3, and C4 deficiencies], and phagocytic disorders [excluding chronic granulomatous disease]), generalized malignancy, HIV infection, Hodgkin disease, iatrogenic immunosuppression (including disease requiring treatment with immunosuppressive drugs such as long-term systemic corticosteroids and radiation therapy), leukemia, lymphoma, multiple myeloma, nephrotic syndrome, sickle cell disease and other hemoglobinopathies, and solid organ transplant. Excludes persons with a hematopoietic stem cell transplant.
[b]If PCV15 is not available, PCV13 may be used instead.
[c]Refer to **Table 2** for intervals and schedules regarding sequential PCV15+PPSV23 vaccination.
PCV20, 20-valent pneumococcal conjugate vaccine; PCV15, 15-valent pneumococcal conjugate vaccine; PPSV23, 23-valent pneumococcal polysaccharide vaccine; PCV13, 13-valent pneumococcal conjugate vaccine.

of the Korean Society of Infectious Diseases recommends either a single dose of PCV20 or sequential vaccination with PCV15 followed by PPSV23 for adults aged 65 years and older, as well as high-risk adults aged 19–64 years (including those with chronic medical conditions, specified immunocompromising conditions, and cerebrospinal fluid leaks or cochlear implants). The choice of vaccine, interval between doses, and vaccination schedule according to underlying conditions and prior vaccination history are detailed in **Tables 2** and **4**. Persons with hematopoietic stem cell transplant (HSCT) are excluded from the standard vaccination recommendations in **Tables 3** and **4** because they require specialized vaccination protocols. HSCT recipients should receive a series of three pneumococcal conjugate vaccine doses starting 3 months post-transplant, regardless of pre-transplant vaccination history, followed by consideration of additional dose of pneumococcal conjugate vaccine or pneumococcal polysaccharide vaccine based on individual risk assessment and expert consultation [14, 15].

Key research priorities for future guideline updates in Korea include: (1) comprehensive disease burden (incidence, mortality, morbidity) assessment of IPD, pneumococcal pneumonia, and acute otitis media across different population groups (children, elderly, risk groups); (2) real-world effectiveness studies of PCV20 and PCV15+PPSV23 strategies in Korean adults, particularly for community-acquired pneumonia prevention; (3) economic evaluation incorporating indirect effects and updated serotype distribution data, including assessment of the upcoming PCV21; and (4) duration of protection and need for revaccination with newer conjugate vaccines. These evidence gaps highlight the importance of continued surveillance and targeted research to support future revisions of pneumococcal vaccination guidelines in Korea.

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