



Vaccination strategies for pneumococcal disease: Update and perspectives on clinical need and impact

Practice aid for pneumococcal vaccines

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Pneumococcal disease: Overview and burden

*Streptococcus pneumoniae*¹



Gram-positive bacterium¹
>90 immunological serotypes¹



A main cause of CAP²⁻⁵



European incidence:^{6*}
45–2,940/100,000

Invasive pneumococcal disease



Prevalent symptoms⁷

- Otitis media
- Sinus infection
- Pneumonia
- Conjunctivitis

Hallmark clinical features⁸

- Bacteraemia (without focus in children <5 years)
- Meningitis
- Pleural infection



Epidemiology in EU/EEA, 2018⁹

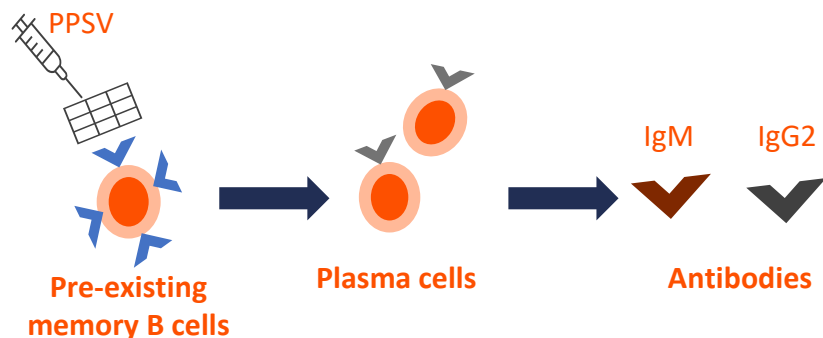
Cases per 100,000 population:

- Overall: **6.4 cases**
- Infants aged <1 year: **14.4 cases**
- Adults aged ≥65 years: **18.7 cases**

Pneumococcal vaccines and serotype replacement

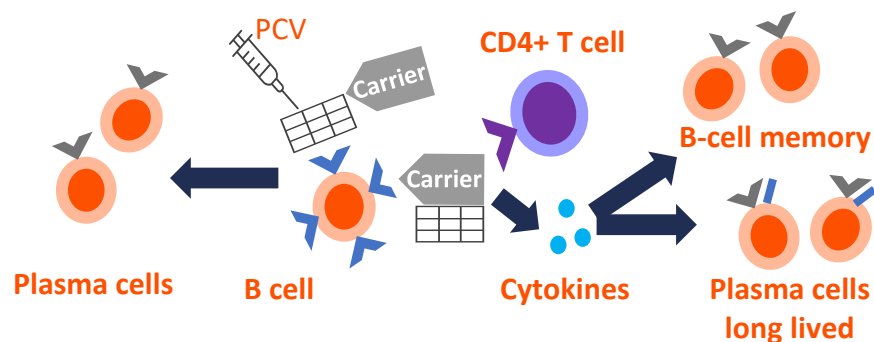
Pneumococcal polysaccharide vaccine (PPSV)⁸

- Absence of carrier protein
- Immune response determined only by B-lymphocyte stimulation



Pneumococcal conjugate vaccine (PCV)⁸

- Pneumococcal polysaccharide antigens covalently linked to immunogenic carrier protein inducing T cell-dependent response



*Findings from systematic literature review covering 2011 to 2021.

Serotype replacement and the evolution of pneumococcal vaccines

- Several studies across **Europe** and the **USA** reported new serotypes (circled below) associated with CAP and IPD^{8–17}

Vaccine ^{16,17}	1	3	4	5	6A	6B	7F	9V	14	18C	19A	19F	23F	22F	33F	8	10A	11A	12F	15B	9N	15A	15C	16F	17F	20A	23A	23B	24F	31	35B	2	20
PCV7																																	
PCV13																																	
PCV15																																	
PCV20																																	
PCV21																																	
PPSV23																																	

Populations who may require vaccination



Children
<5 years

All in this age group¹⁸



Children
6–18 years

Risk condition or
immunocompromised^{19,*}

- CSF leak
- Chronic liver disease
- Cochlear implant
- Diabetes
- Asplenia/splenic dysfunction
- CHD
- CKD
- Chronic lung disease
- Maintenance dialysis or nephrotic syndrome



Adults
19–64 years

Risk condition or
immunocompromised^{19,*}

- Immunodeficiency
- Immunosuppressive or radiation therapy
- HIV
- SCD or haemoglobinopathy
- Alcoholism, smoking or drug use
- Homelessness
- CHD (excl. hypertension)
- Chronic lung disease
- Chronic renal failure or nephrotic syndrome

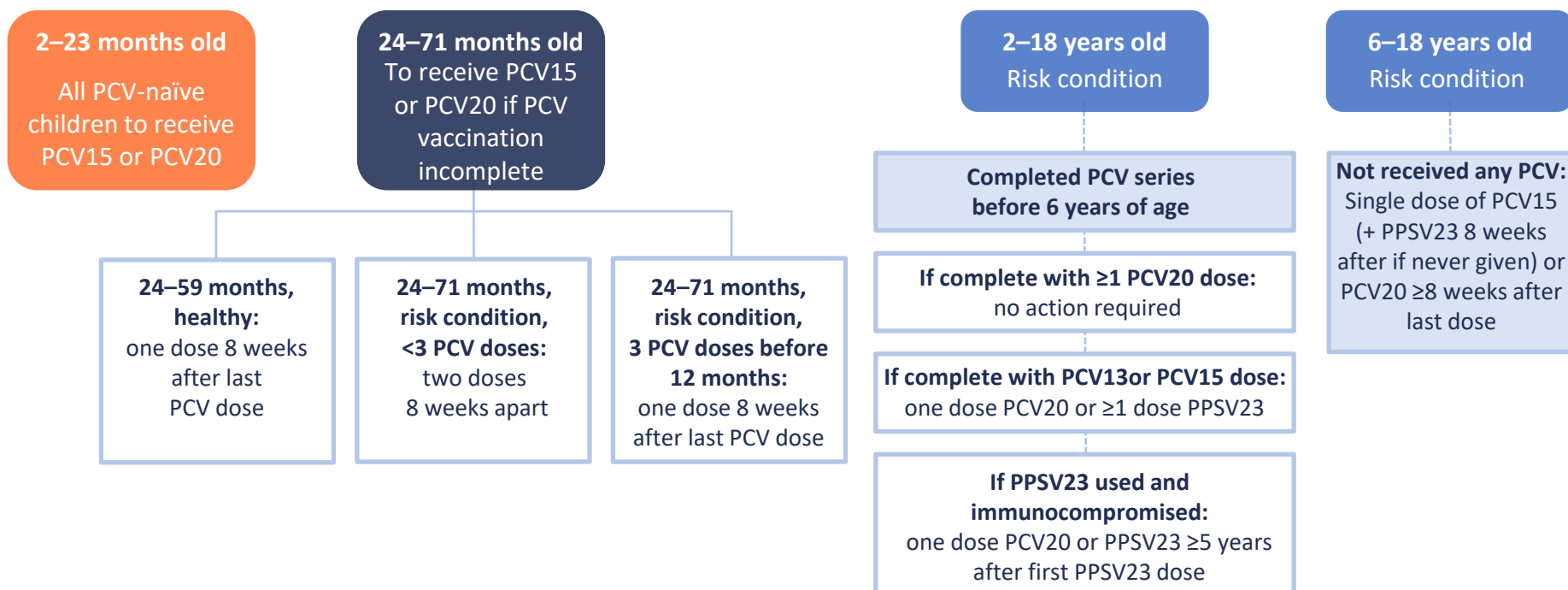


Adults
≥65 years

All in this age group¹⁸

*Please refer to guidelines for further information.

Overview of guideline recommendations for pneumococcal vaccination in children^{20,*}



Additional considerations²⁰

- PCV13 can be used if other PCVs unavailable
- Healthy children aged 24–59 months with complete PCV13 schedule do not need supplemental PCV15 or PCV20
- Children aged <19 years having HSCT are eligible for four doses of PCV20

Co-administration with other vaccines²¹

- PCV15, PCV20 or PPSV23 with most routine childhood vaccines
- PCV15 or PCV20 with flu vaccine (increased risk for febrile seizure with inactivated vaccine)
- No RCT data on PPSV23 co-administration

*Refer to practice guidelines for specific conditions that are included in each section and full recommendations for all populations requiring vaccination.

Overview of guideline recommendations for pneumococcal vaccination in adults^{16,*}

	19–64 years immunocompromised, with CSF leak or cochlear implant	19–64 years with chronic medical condition	≥65 years
No prior PCV or PCV7	<ul style="list-style-type: none"> Single dose of PCV21, PCV20, or PCV15 + PPSV23 ≥8 weeks later 	<ul style="list-style-type: none"> Single dose of PCV21, PCV20, or PCV15 + PPSV23 ≥1 year later 	<ul style="list-style-type: none"> Single dose of PCV21, PCV20, or PCV15 + PPSV23 ≥1 year later or ≥8 weeks later if immunocompromised, with cochlear implant or CSF leak
Prior PPSV23 only	<ul style="list-style-type: none"> Single dose of PCV21, PCV20, or PCV15 ≥1 year later 	<ul style="list-style-type: none"> Single dose of PCV21, PCV20, or PCV15 ≥1 year later 	<ul style="list-style-type: none"> Single dose of PCV21, PCV20, or PCV15 ≥1 year later
Prior PCV13 only	<ul style="list-style-type: none"> Single dose of PCV21 or PCV20 ≥1 year later OR PPSV23 ≥8 weeks later + PCV21, PCV20 or PPSV23 ≥5 years later 	<ul style="list-style-type: none"> Single dose of PCV21, PCV20, or PPSV23 ≥1 year later 	<ul style="list-style-type: none"> Single dose of PCV21, PCV20, or PPSV23 ≥1 year later or ≥8 weeks later if immunocompromised, with cochlear implant or CSF leak
Prior PCV13 + one dose PPSV23	<ul style="list-style-type: none"> Single dose of PCV21 or PCV20 ≥5 years after last PCV dose OR ≥1 dose PPSV23 ≥8 weeks after PCV13 dose and ≥5 years after first PPSV23 dose Review when patient turns 65 	<ul style="list-style-type: none"> Review when patient turns 65 	
Prior PCV13 + two doses PPSV23	<ul style="list-style-type: none"> Review when patient turns 65, OR Single dose of PCV21 or PCV20 ≥5 years after last PCV dose 		
			<ul style="list-style-type: none"> Single dose of PCV21 or PCV20 ≥5 years after last PCV dose, OR PPSV23 ≥1 year later (or ≥8 weeks later if immunocompromised, with cochlear implant or CSF leak) and ≥5 years after last PPSV23 dose
			<ul style="list-style-type: none"> Shared clinical decision on whether to vaccinate further If single dose of PCV21 or PCV20 used, give ≥5 years after last PCV dose

Co-administration with other vaccines^{16,21}

- PCV15, PCV20, PCV21 or PPSV23 with other vaccines (based on contraindications) including flu
- Inject at different sites
- Flu elevates risk for PD; important to provide both vaccines where possible

*Refer to practice guidelines for specific conditions that are included in each section and full recommendations for all populations requiring vaccination.

Abbreviations and references

Abbreviations

ACIP, Advisory Committee on Immunization Practices; CAP, community-acquired pneumonia; CHD, chronic heart disease; CKD, chronic kidney disease CSF, cerebrospinal fluid; HIV, human immunodeficiency virus; HSCT, haematopoietic stem cell transplantation; Ig, immunoglobulin; IPD, invasive pneumococcal disease; MCV4-D, meningococcal conjugate vaccine; PCV, pneumococcal conjugate vaccine; PD, pneumococcal disease; PPSV, pneumococcal polysaccharide vaccine; RCT, randomized controlled trial; SCD, sickle cell disease.

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The guidance provided by this practice aid is not intended to directly influence patient care. Clinicians should always evaluate their patients' conditions and potential contraindications and review any relevant manufacturer product information or recommendations of other authorities prior to consideration of procedures, medications, or other courses of diagnosis or therapy included here.

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