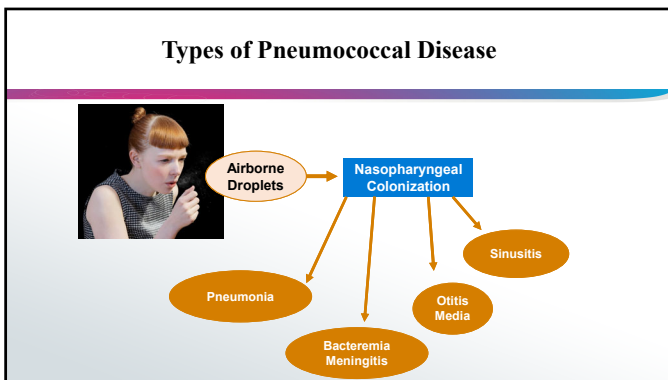


Maximizing Opportunities
to Protect Vulnerable Adults
Against Pneumococcal Disease

Supported by an educational grant from Merck & Co., Inc. Jointly provided by Center for Independent Healthcare Education and Vemco MedEd

VMEC Independent Education



Pneumococcal Disease: Scope of the Problem

<p>PNEUMOCOCCAL DISEASE</p> <ul style="list-style-type: none"> • Sinusitis • Otitis media • Pneumonia • IPD <p>Cases USA</p> <ul style="list-style-type: none"> • 4,000,000 cases/year • 445,000 hospital admissions/year • 22,000 deaths/year 	<p>INVASIVE PNEUMOCOCCAL DISEASE</p> <ul style="list-style-type: none"> • Bacteremia • Meningitis • Sepsis • Cases USA <ul style="list-style-type: none"> • 12.9 cases/100K • ~10% case-fatality rate • More frequent in seniors, persons with chronic medical conditions • >2000 deaths/year in 65+
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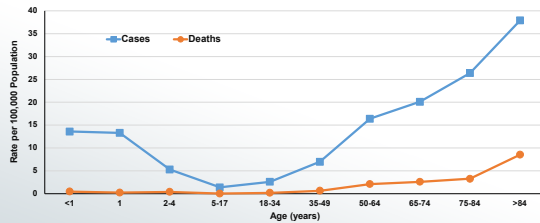
IPD, Invasive pneumococcal disease. Centers for Disease Control and Prevention. Manual for the surveillance of vaccine-preventable diseases. http://www.cdc.gov/vaccines/imz/downloads/manual/cas11_ipdpcms.html. Accessed July 24, 2020.

Risk Factors for Invasive Pneumococcal Disease in Adults

- Immunocompromised or immunosuppressed
- Functional or anatomic asplenia
- Chronic heart, lung (including asthma), liver, or renal disease
- Cigarette smoking
- Cerebrospinal fluid leak or cochlear implant

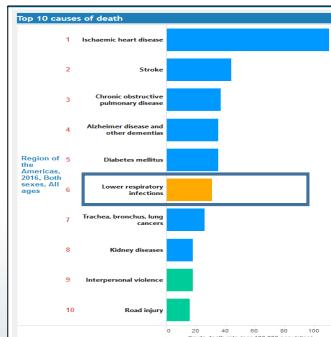
CDC. Pneumococcal disease. Available at: <https://www.cdc.gov/pneumococcal/cldncians/risk-factors.html>

Active Bacterial Core Surveillance, Invasive Pneumococcal Infection (2016)

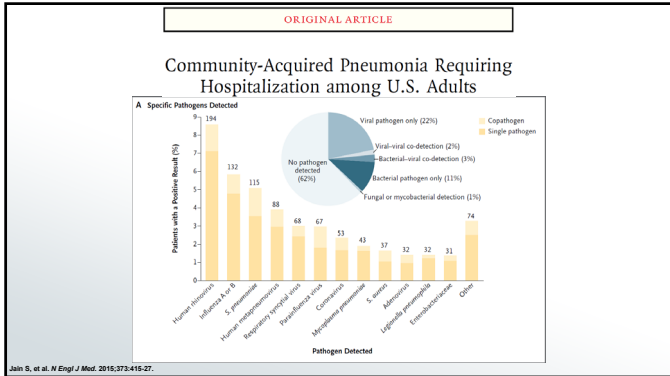


CDC. Active Bacterial Core Surveillance Report. Available at: <https://www.cdc.gov/abc/surveillance/2016/surveillance-report/2016.pdf>

WHO Top 10 Causes of Death: Region of the Americas



WHO. Available at: https://www.who.int/datalab/region_of_the_americas_top_10_causes_of_death_top_10.htm



Clinical Infectious Diseases
MAJOR ARTICLE

IDSA | hivma

Prevalence and Etiology of Community-acquired Pneumonia in Immunocompromised Patients

Marta Francesca Di Pasquale,^{1,2} Giovanni Sotgiu,¹ Andrea Grangeola,¹ Dejan Radovanovic,³ Silvia Terranova,¹ Luis F. Reyes,⁴ Jan Rupp,⁴ Juan Gonzalez del Castillo,⁵ Francesco Biasi,⁶ Stefano Aliberti,⁷ and Marcos J. Restrepo,⁸ on behalf of CLIMP Investigators

Table 2. Pathogens in the 2 Study Groups

Pathogen	Patients, No. (%)		P Value
	Immunocompetent (n = 2020)	Immunocompromised (n = 580)	
<i>Streptococcus pneumoniae</i>	218 (8.3)	50 (8.6)	> .99
Atypical	80 (11.6)	13 (2.2)	.78
Legionella	21 (0.8)	10 (1.7)	.08
MRSA	65 (3.2)	12 (2.0)	.17
MRSA	73 (3.8)	20 (3.4)	.53
<i>Pseudomonas aeruginosa</i>	98 (5.3)	28 (5.0)	.02
<i>Haemophilus influenzae</i>	65 (3.2)	10 (1.7)	.31
<i>Klebsiella pneumoniae</i>	89 (4.4)	22 (3.7)	.81
<i>Influenza virus</i>	128 (6.4)	29 (5.0)	> .99

Di Pasquale MF, et al. *Clin Infect Dis.* 2019;68:1482-88.

Contents lists available at ScienceDirect

Clinical Microbiology and Infection

journal homepage: www.clinicalmicrobiologyandinfection.com

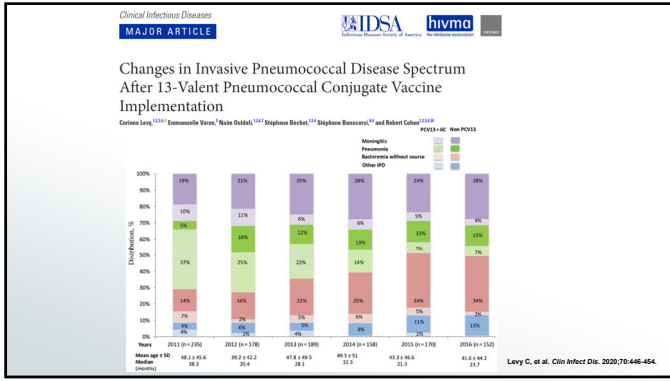
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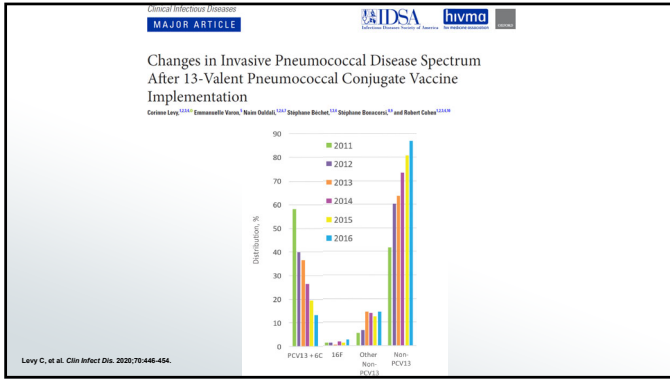
CMI
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AND
INFECTION

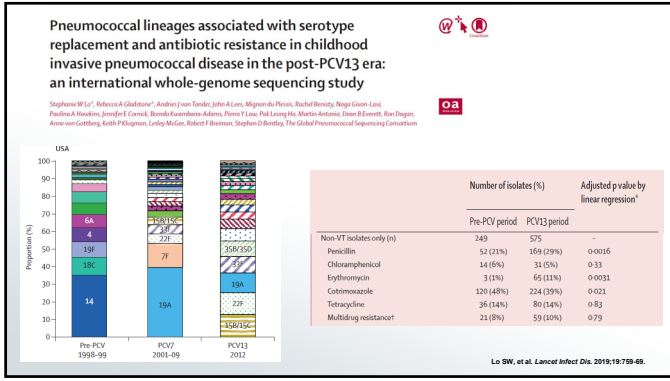
Narrative review
Resurgence of pneumococcal meningitis in Europe and Northern America
D.L.H. Koelman, M.C. Brouwer, D. van de Beek*

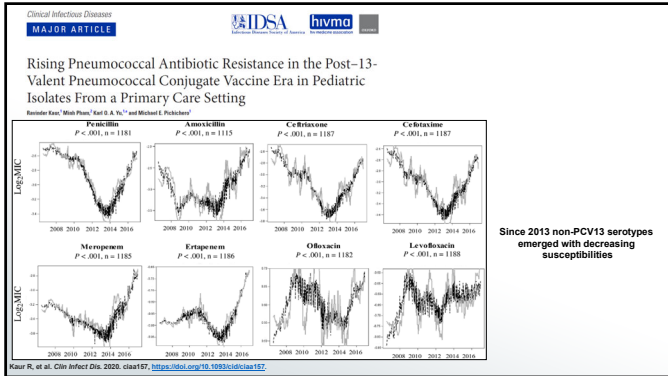
- 70% of bacterial meningitis cases
- High rates of mortality
- Impressive reduction post conjugate vaccines
- Serotype replacement is a concern & degrading this reduction
- Need for new vaccines and strategies continues

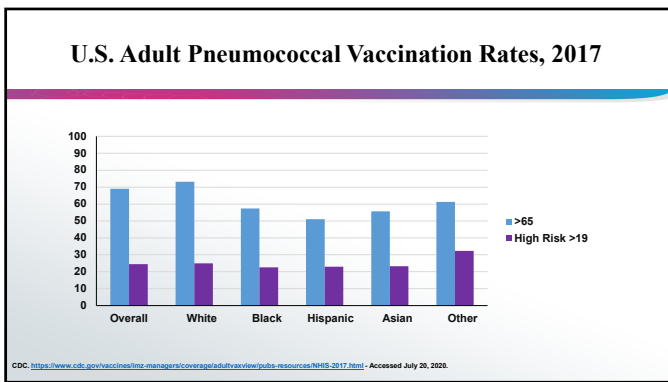
Koelman DLH, et al. *Clin Microbiol Infect.* 2020;26:199-204.

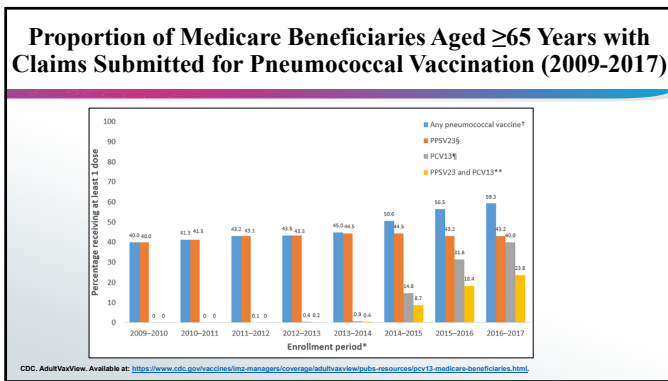














Clinical Infectious Diseases
MAJOR ARTICLE

Differences and Temporal Changes in Risk of Invasive Pneumococcal Disease in Adults with Hematological Malignancies: Results from a Nationwide 16-Year Cohort Study

Michael Ager Andersen,^{1,2} Carsten Uhlfir Riessen,^{1,2} Klaus Rothbarth,¹ Tine Dohly,¹ Renees Saeng,¹ Daniel M. Weinberger,¹ Henrik Kjalvig,^{1,2} and Tina Brendle Veiersted¹

- 85,002,224 person-years of observation
- 13,332 episodes of IPD
- 5.7% of cases in hematologic malignancy patients (HMP)
- Risk of IPD 39x higher than baseline in HMP
- Vaccine uptake ≤2% in HMPs

Anderson MA, et al. *Clin Infect Dis*. 2020;ciaa090. <https://doi.org/10.1093/cid/ciaa090>

Recommended Adult Immunization Schedule
for ages 19 years or older

UNITED STATES
2020

How to use the adult immunization schedule

- 1 Determine recommended vaccinations by age (Table 1)
- 2 Assess need for additional recommended vaccinations by medical conditions and other indications (Table 2)
- 3 Review vaccine types, frequencies, and intervals and consider them for special situations (Notes)

Recommended by the Advisory Committee on Immunization Practices (www.cdc.gov/nceiz) and approved by the Centers for Disease Control and Prevention (www.cdc.gov), American College of Physicians (www.acponline.org), American Academy of Family Physicians (www.aafp.org), American College of Obstetrics and Gynecology (www.acog.org), and American College of Bone and Joint Physicians (www.jointbone.org).

Vaccine	19–26 years	27–49 years	50–64 years	≥65 years
Pneumococcal conjugate (PCV13)		1 dose		65 years and older
Pneumococcal polysaccharide (PPSV23)		1 or 2 doses depending on indication		1 dose

Recommended vaccination based on shared clinical decision-making

CDC <https://www.cdc.gov/vaccines/schedules/pcip/ma/adult.html>

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- 19–64 with chronic medical conditions (chronic heart [not htn], lung, or liver dz, diabetes), alcoholism or cigarette smoking – 1 dose PPSV23
- 19 or >: Immunocompromised
 - Congenital or acquired B & T lymphocyte deficiency
 - Complement deficiency
 - Phagocytic disorders
 - HIV
 - Chronic renal failure
 - Nephrotic syndrome
 - Leukemia
 - Lymphoma
 - Hodgkin's disease
 - Generalized malignancy
 - Iatrogenic immunosuppression
 - Asplenia

- 1 dose PCV13 followed by 1 dose PPSV23 at least 8 weeks later, then another dose of PPSV23 at least 5 years after previous PPSV23
- At 65 or older, administer 1 dose of PPSV23 at least 5 years after most recent PPSV23
- Only 1 dose of PPSV23 for 65 or older

CDC <https://www.cdc.gov/vaccines/schedules/pcip/ma/adult.html>

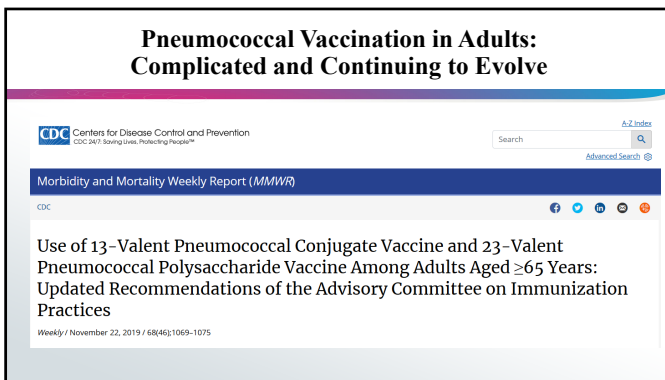
Case 1

You see a 66-year-old man who is generally healthy and had received the PCV13 vaccine one year ago.

You recommend:

- a. Administer PCV13 booster dose today
- b. Administer PPSV23 today and no other pneumococcal vaccine is needed**
- c. Administer PPSV23 today and PPSV23 booster dose in 5 years
- d. No additional pneumococcal vaccination is needed

Pneumococcal Vaccination in Adults: Complicated and Continuing to Evolve



Routine Vaccination

- **Age 65 years and older (immunocompetent)**
 - 1 dose PPSV23 is recommended.
 - 1 dose PCV13 is recommended **based on shared clinical decision-making**.
 - If both PCV13 and PPSV23 are to be administered, PCV13 should be administered first
 - PCV13 and PPSV23 should be administered at least 1 year apart
 - PPSV23 should be administered at least 5 years after any previous PPSV23 dose
 - PCV13 and PPSV23 should not be administered during the same visit
 - Only 1 dose PPSV23 should be administered on or after the 65th birthday

CDC. MMWR Wkly. 2019;68(46):1069-75.

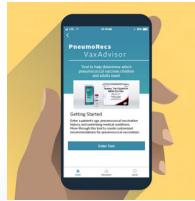
Why the "...Shared Clinical Decision Making.?"

- 2014–2017: no reduction in PCV13-type IPD in adults aged ≥65 years
- Incidence stable at 5 per 100,000 population (20% of all IPD)
- 2014–2016, no reduction in noninvasive pneumococcal pneumonia (all serotypes)
- Unpublished cohort –
 - 31.5% reduction in PCV13-type pneumonia
 - 13.8% reduction in all-cause pneumonia between 2014–2015 and 2015–2016
 - PCV13-types 4% of pneumonia aged ≥65 2015–2016 vs 10% in 2014
- Since the 2014 recommendation for PCV13 use among adults
 - Minimal changes in pneumococcal disease in adults at the population level

CDC. *MMWR Wkly.* 2019;(68(46)):1069-71.

PneumoRecs VaxAdvisor Mobile App

- Helps providers quickly and easily determine which pneumococcal vaccine a patient needs and when
- Simply input:
 - Patient age
 - Specific underlying medical conditions
 - Prior pneumococcal vaccination history



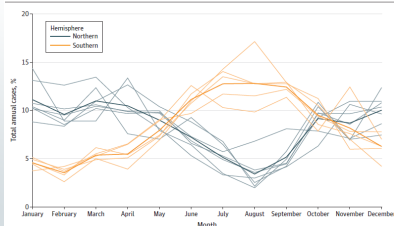
CDC. PneumoRecs VaxAdvisor. Available at: <https://www.cdc.gov/vaccines/imz/id/pneumo/recp/pneumoapp.html>.

JAMA
Networks | **Open.**

Original Investigation | Global Health Association of Influenza Activity and Environmental Conditions With the Risk of Invasive Pneumococcal Disease

Isha Berry, MSc, Ashleigh R. Tuite, PhD, MPH, Angela Salmon, MPH, Steven Davies, PhD, DABMM, Anthony D. Harris, MD, MPH, Todd Hatchette, MD, Caroline Johnson, MD, Jeff Kwong, MD, MSc, Jose L.igo, MPH, Allison McGee, MD, MSc, Leonard Mermet, DO, ScM, Victoria Ng, PhD, David N. Fisman, MD, MPH

Figure 1. Seasonality of Invasive Pneumococcal Disease by Hemisphere



Canada, U.S. & Australia
Case-crossover study to control for seasonal covariation
↑ influenza activity =
↑ IPD risk 2 weeks later

Berry I, et al. *JAMA Netw Open.* 2020;3(7):e2019167.

Contents lists available at ScienceDirect
Vaccine
 journal homepage: www.elsevier.com/locate/vaccine

Silver lining of COVID-19: Heightened global interest in pneumococcal and influenza vaccines, an infodemiology study

Joseph Alexander Paguiso^a, Jasper Seth Yao^a, Edward Christopher Dee^{b,*}

^aUniversity of the Philippines College of Medicine, Philippines
^bHarvard Medical School Boston, MA, USA

- The highest risk groups for COVID are also:
 - The highest risk for influenza complications
 - The highest risk for pneumococcal pneumonia complications
- Utilization of interest in COVID vaccines and prevention to:
 - Educate on vaccines as a whole
 - Educate on the importance & safety of pneumococcal vaccine
 - Educate on the importance & safety of influenza vaccines

Case 2

You see a 49-year-old hospitalized woman with an extensive history of alcohol use disorder. She has had minimal contact with the healthcare system and you can find no history of pneumococcal vaccination.

You recommend:

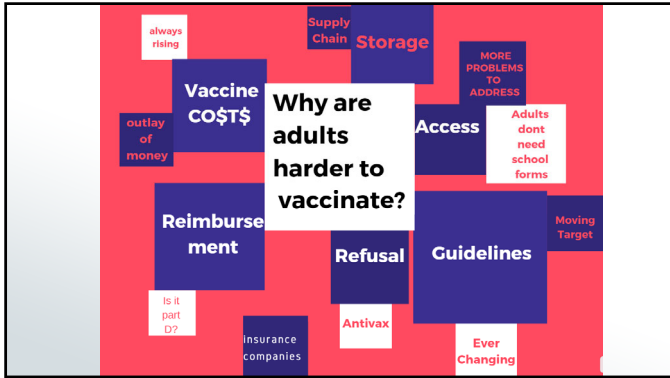
- Administer PCV13 on discharge and no other pneumococcal vaccine is needed until 65
- Administer PPSV23 on discharge and no other pneumococcal vaccine is needed until 65**
- Administer PPSV23 on discharge and a PPSV23 booster dose in 5 years
- No pneumococcal vaccination is needed

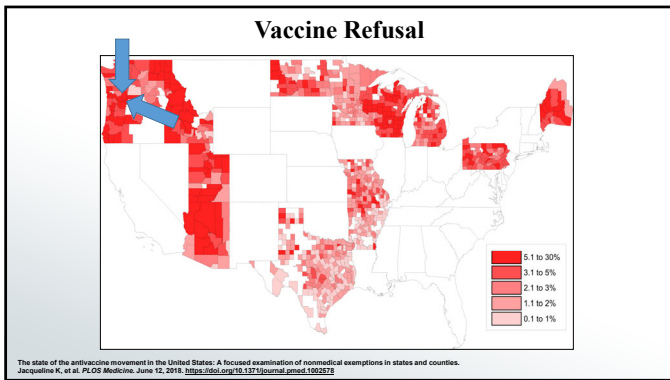
US Standards for Adult Vaccination

Per CDC:

- ASSESS vaccination status of all patients in every clinical encounter
- Strongly RECOMMEND vaccines that patients need
- ADMINISTER needed vaccines or REFER to a provider who can vaccinate
- DOCUMENT vaccines received by your patients

Centers for Disease Control and Prevention. Standards for adult immunization practice: Overview. Available at: <https://www.cdc.gov/vaccines/imz/downloads/standards/index.html>





US Adults Attitudes Toward Vaccines

American Osteopathic Association

- The Harris Poll
- >2,000 US adults
- May 2019

American Osteopathic Association. <https://osteopathic.org/2019/06/24/45-of-american-adults-doubt-vaccine-safety-according-to-survey/>.

45% of American Adults Doubt Vaccine Safety

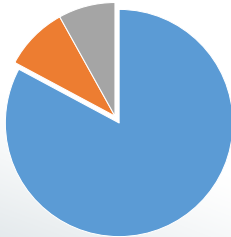
Which of the following have caused you to doubt the safety of vaccines?

- Nothing—I don't doubt the safety of vaccines 55%

American Osteopathic Association. <https://osteopathic.org/2019/06/24/45-of-american-adults-doubt-vaccine-safety-according-to-survey/>.

Safety and Efficacy

82% favorable
9% unsure
8% negative

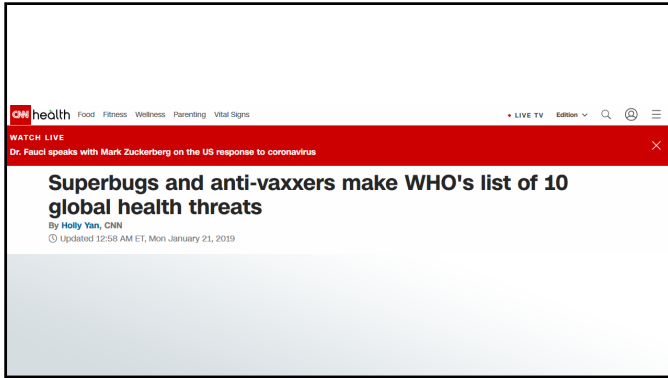


American Osteopathic Association. <https://osteopathic.org/2019/06/24/45-of-american-adults-doubt-vaccine-safety-according-to-survey/>.

Sources of Information

- Top 3:
- 16% said Online Articles
 - 12% past wrongdoing by industry
 - 11% info from Medical Experts

American Osteopathic Association. <https://osteopathic.org/2019/06/24/45-of-american-adults-doubt-vaccine-safety-according-to-survey/>.



Vaccine Hesitancy

- Hesitancy has been increasing among patients and parents
- It is a spectrum: many are neither pro nor anti-vaccine but are in the middle.
- Provider introduction and recommendation is very important.

Hesitancy

- Presumptive style of communication
 - (continue discussion about why the vaccine is important vs deferring vaccination)
- Strong, direct communication
 - Even when parents verbally assertively expressed hesitancy, 33% were vaccinated same day.

Shay DA, et al. Pediatrics. 2016;141(8):e20172312.

Case 3

You see a 52-year-old man who has been newly diagnosed with AML.

You recommend:

- a. Administer PCV13 dose today
- b. Administer PPSV23 today and no other pneumococcal vaccine is needed
- c. Administer PCV13 today and PPSV23 dose in 8 weeks**
- d. No pneumococcal vaccination is needed

CDC. Clin Infect Dis. 2014;58:e44-e100. <https://www.cdc.gov/vaccines/imz/downloads/pdf/13m14a01.html>

Conclusions

- Pneumococcal disease has been and remains a major concern
- The organism continues to evolve under antibiotic and vaccine pressure
- New strategies and vaccines are necessary
- Vaccination rates of high-risk patients and those over 65 years is unacceptable
- All clinicians have a responsibility to be strong advocates for vaccination
