Infectious Diseases Potpourri

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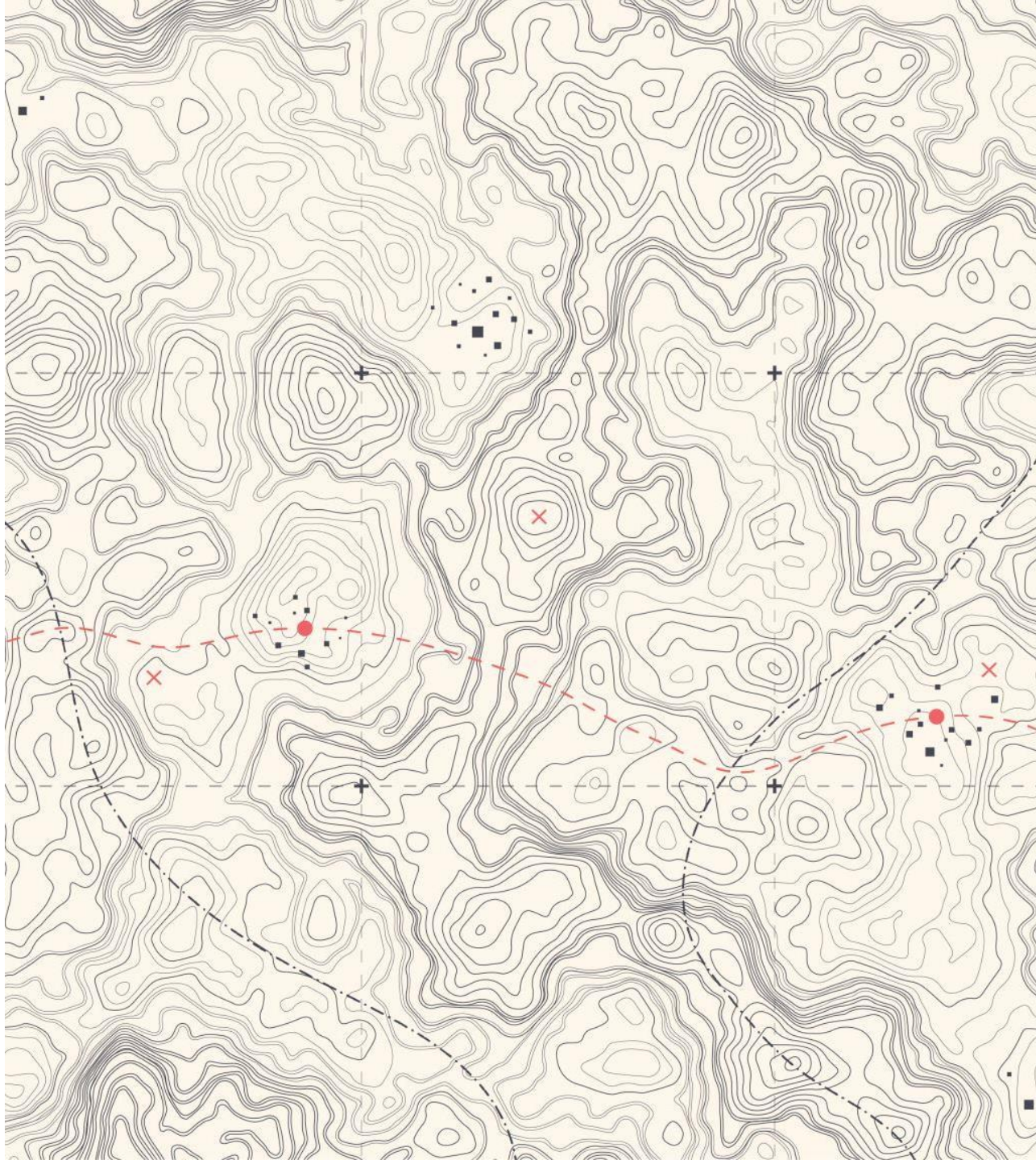
10.19.24

Map for Today

- Why think about antibiotic prescribing?
- Apply antibiotic stewardship principles to treating common bacterial infections
  - Upper respiratory infections
  - Community acquired pneumonia
  - Asymptomatic bacteriuria vs. urinary tract infections
  - Skin and soft tissue infections
- Vaccine updates (resp focus)



Power of Antibiotics

Disease	Pre-Antibiotic Death Rate	Death With Antibiotics	Change in Death
Community Pneumonia[1]	~35%	~10%	-25%
Hospital Pneumonia[2]	~60%	~30%	-30%
Heart Infection[3]	~100%	~25%	-75%
GNB Bacteremia[4]	~80%	~10%	-70%
Brain Infection[5]	>80%	<20%	-60%
Skin Infection[6]	11%	<0.5%	-10%
By comparison…treatment of myocardial infarction with aspirin or fibrinolytic drugs[6]			*-3%*

[1]IDSA Position Paper '08 Clin Infect Dis 47(S3):S249-65; [2]IDSA/ACCP/ATS/SCCM Position Paper '10 Clin Infect Dis 51(S1):S150-70; [3]Kerr AJ. Subacute Bacterial Endocarditis. Springfield IL: Charles C. Thomas, 1955 & Lancet 1935 226:383-4; [4]Lancet '38 231:733-4 & Waring et al. '48 Am J Med 5:402-18; [5]Spellberg et al. '09 Clin Infect Dis 49:383-91 & Madsen '73 Infection 1:76-81; [6]'88 Lancet 2:349-60; Spittel '54 Staff Proc Mayo Clin; Spittel '56 Ann Int Med 44:302-315; Hall & Gold '55 Arch Int Med 96:403-12

Source: Dr. Brad Spellberg

Where Are We Now?

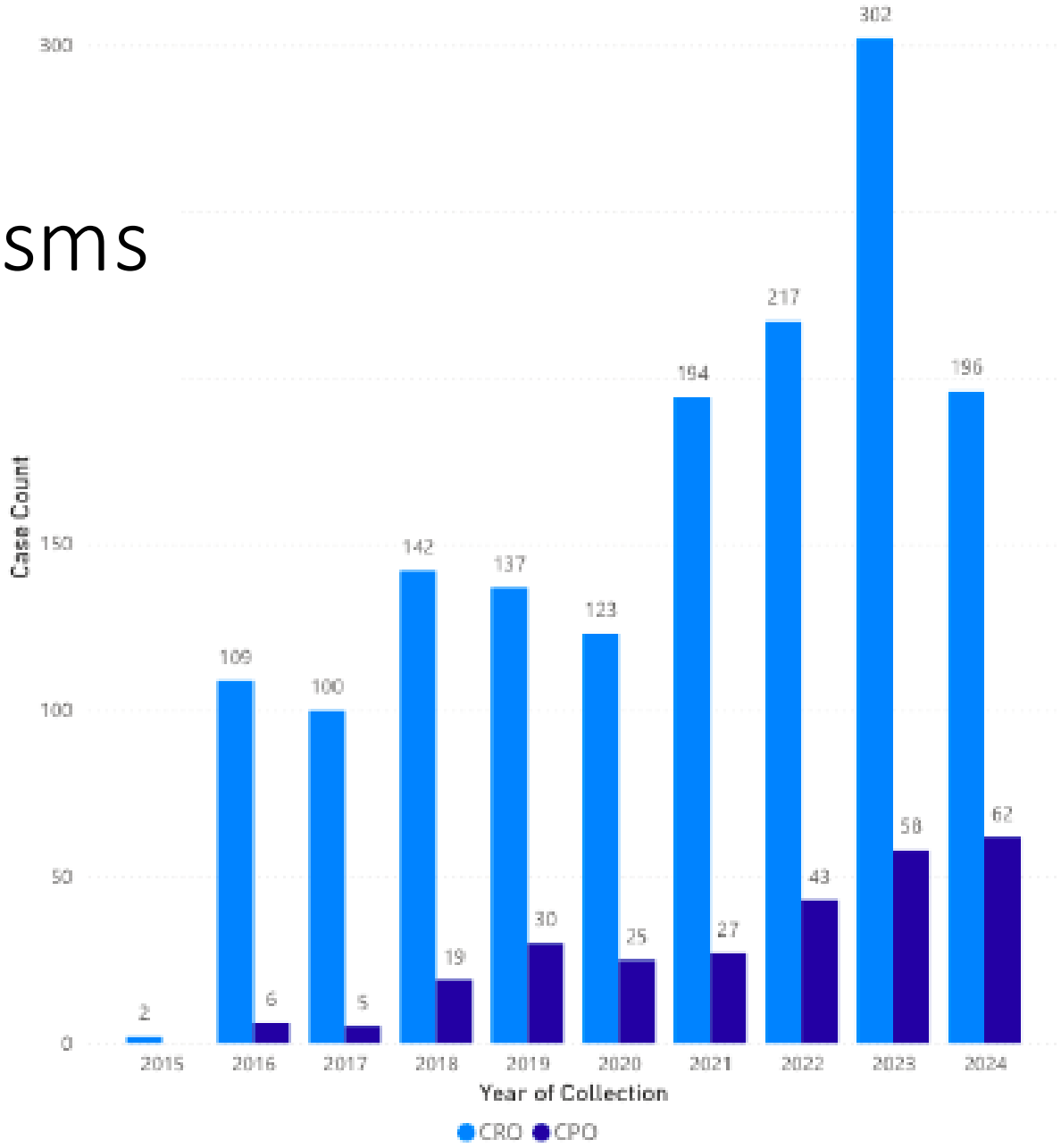
US: ABX Resistance Increased During and Post-COVID-19 Pandemic

CDC – Special Report 2022

Available data show an alarming increase in resistant infections starting during hospitalization, growing at least 15% from 2019 to 2020.

- Carbapenem-resistant *Acinetobacter* (↑78%)
- Antifungal-resistant *Candida auris* (↑60%)*
- Carbapenem-resistant Enterobacterales (↑35%)
- Antifungal-resistant *Candida* (↑26%)
- ESBL-producing Enterobacterales (↑32%)
- Vancomycin-resistant Enterococcus (↑14%)
- Multidrug-resistant *P. aeruginosa* (↑32%)
- Methicillin-resistant *Staphylococcus aureus* (↑13%)

Carbapenem Resistant Organisms in New Mexico by Year



[NM Dept of Health – Carbapenem Resistant Organisms]

Day-to-Day Implications for AMR

- Oral ABX may not treat common infections
  - Hospital admissions, IV ABX, PICC lines
- Patients with post-operative infections that may not be treatable
- Advances such as solid organ transplant, immunosuppressive cancer treatments, and stem cell/bone marrow transplants will be impacted
- Patient morbidity, mortality, and length of hospital stay

Dadgostar P. Infect Drug Resist. 2019; 12: 3903–3910.doi: 10.2147/IDR.S234610

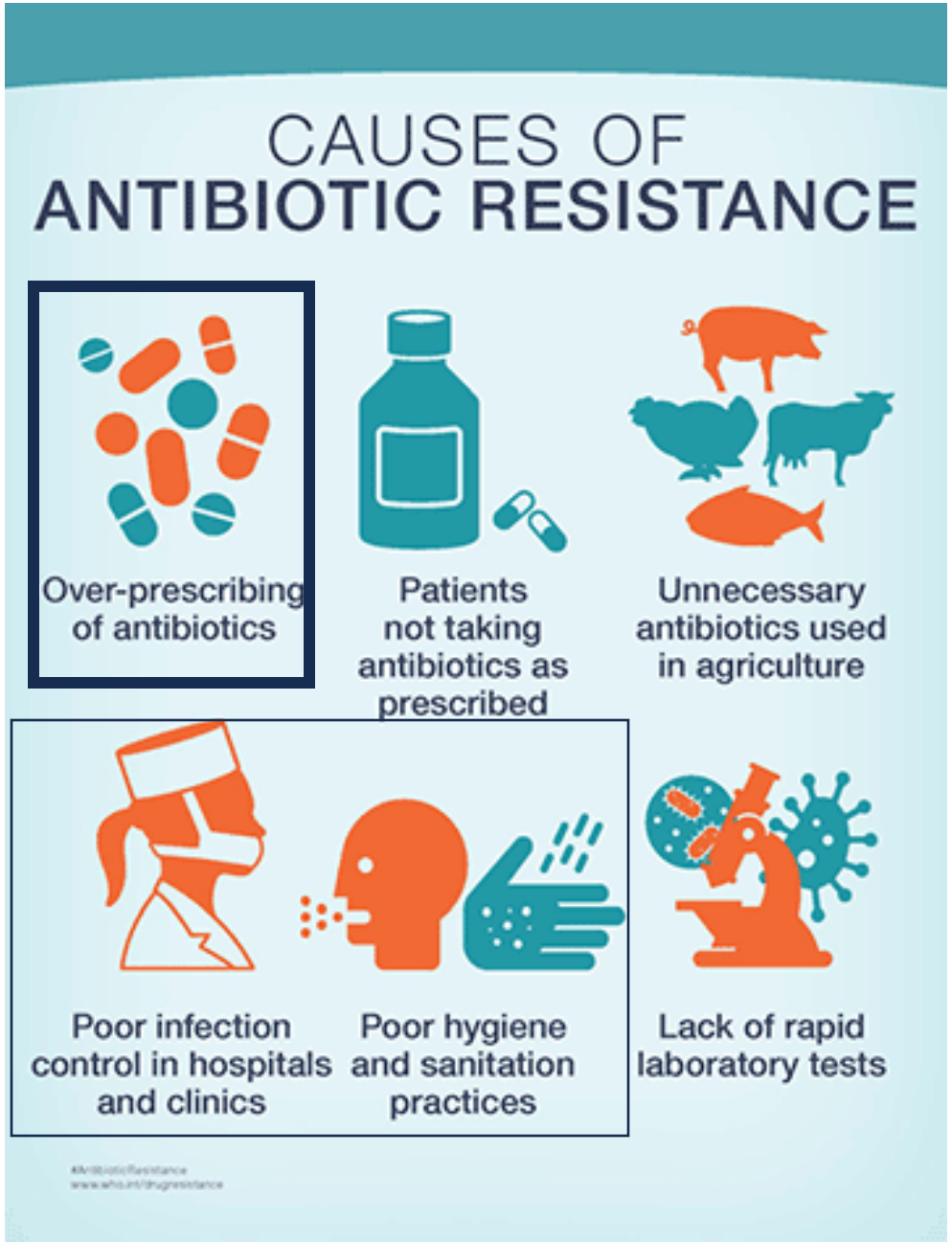
Case Presentation

- 53 y/o F with AML
- Admitted with neutropenic fever with sepsis from unknown source
- PICC line placed during previous admission
- Blood cultures yield an *E. coli*

E. coli Blood Culture Isolate

Antibiotic Name	MIC (µg/mL)	Interpretation
Aztreonam	> 16	Resistant
Cefoxitin	> 32	Resistant
Ceftriaxone	> 32	Resistant
Ceftazidime		tant
Tobramycin		tant
Ciprofloxacin	> 2	Resistant
Ertapenem	> 4	Resistant
Meropenem	> 8	Resistant
Pip/tazo	> 64/4	Resistant
SMX/TMP	> 2/38	Resistant

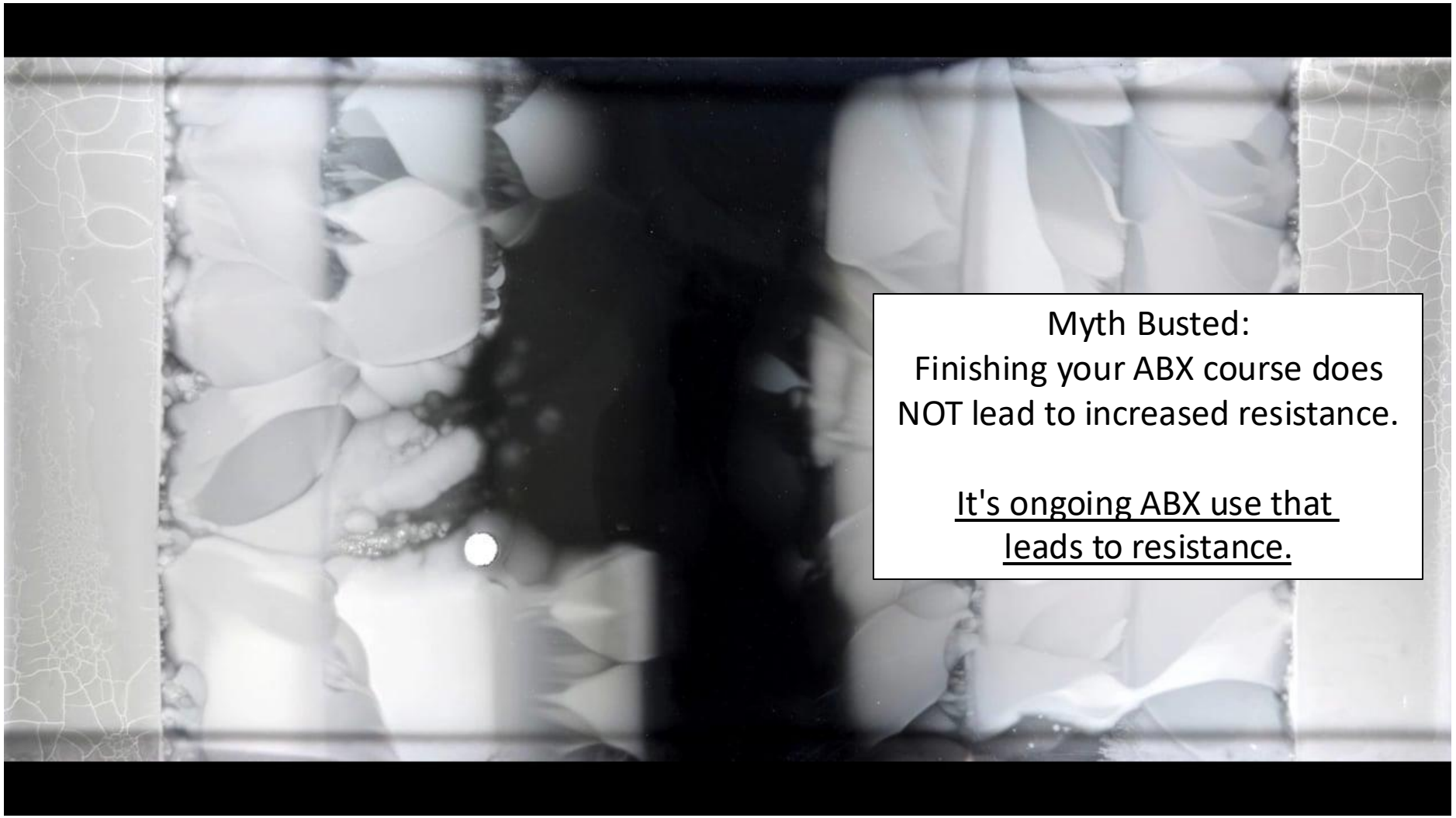
Carbapenem Resistant *E. coli* (CRE)
+NDM gene



Other Contributors

- Travel & population migrations
- Under-dosing of ABX
- Environmental sources of ABX resistance

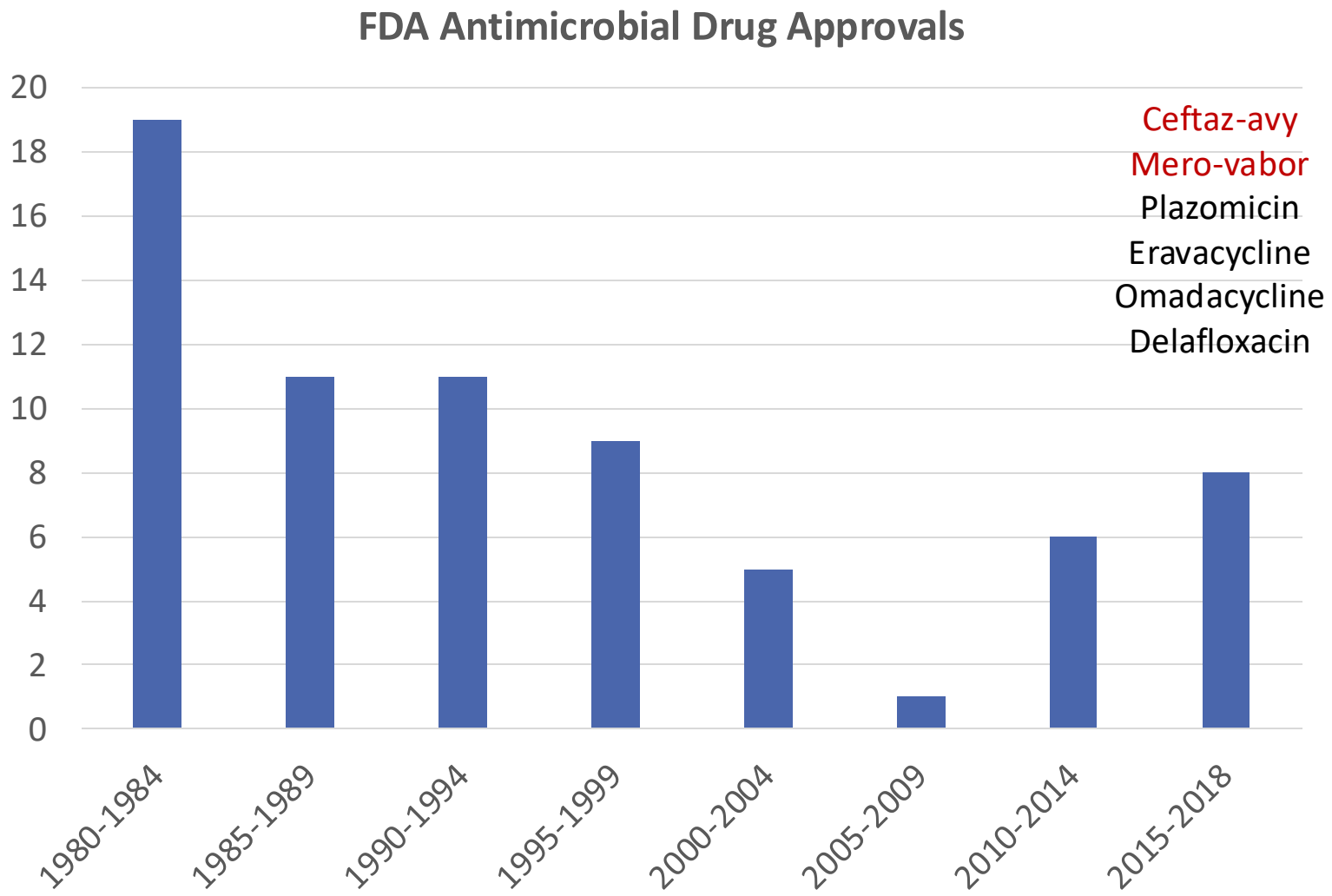
The Evolution of Bacteria on a “Mega-Plate” Petri Dish (Kishony Lab)



YouTube Link

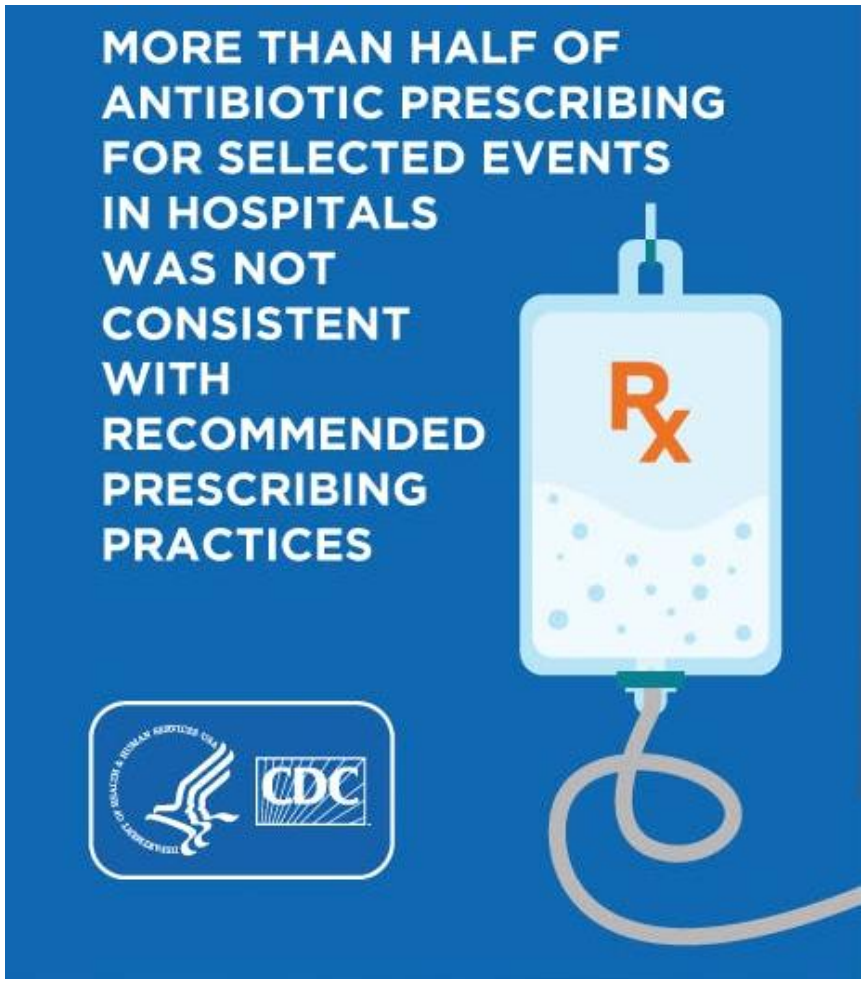
Antibiotic Pipeline

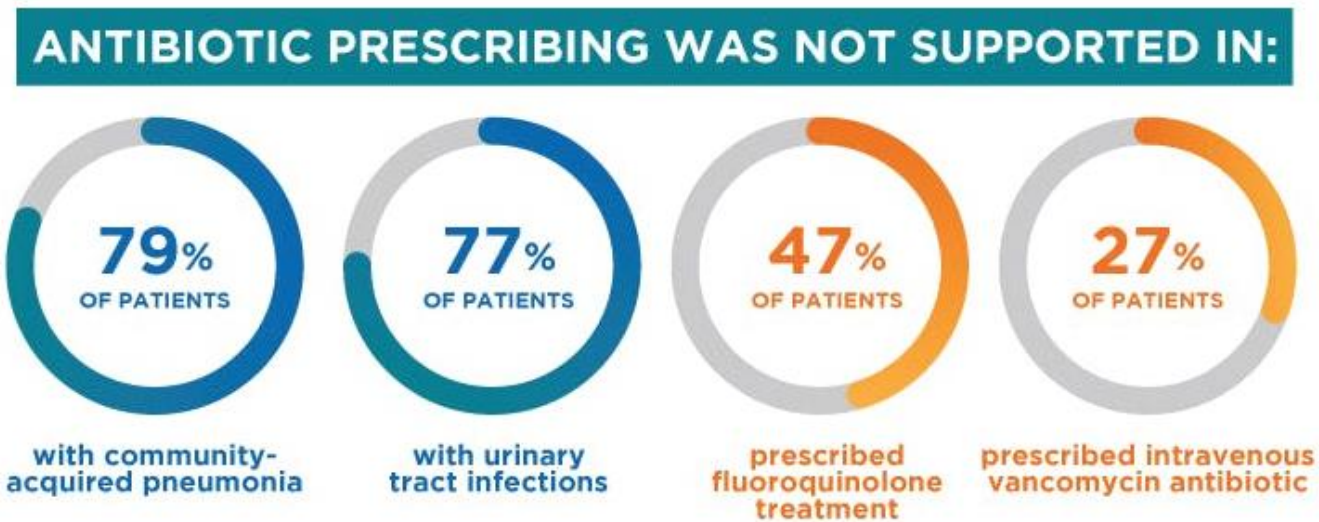
Fewer ABX now **and**
Uncertain ongoing drug development



Credit: Carla Walraven

Tracking the Global Antibiotic Pipeline (link). Animation.





Magill SS et al. JAMA 2021 (Link)

What Can You Do?

Rethinking Our Relationship with Antibiotics

Realize that antibiotics **are not benign**

- **Short-term** & long-term **consequences**

Use shorter courses. **Often** appropriate!

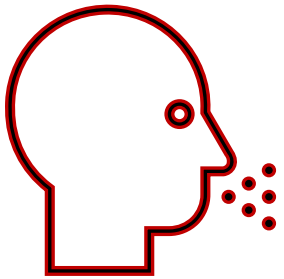
Limit using antibiotics as "Drugs of Fear"

Stop (or not starting) antibiotics **when it's not a bacterial infection**

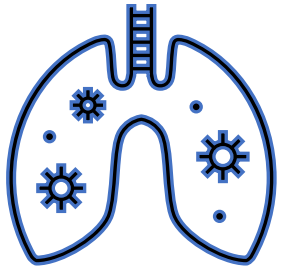
De-escalate **ABX (narrowing,** changing to orals). It's **standard of care**!

Antibiotic prophylaxis: prescribe for **what's needed then** STOP

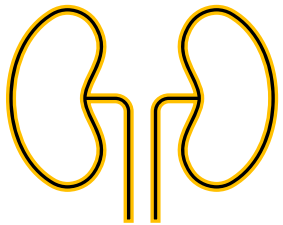
Specific Infections



Upper Respiratory Infections



Lower Respiratory Infections



Urinary Tract Infections

Open Forum Infectious Diseases

PERSPECTIVES

IDSA Infectious Diseases Society of America

hivma hiv medicine association

OXFORD

Can the Future of ID Escape the Inertial Dogma of Its Past? The Exemplars of Shorter Is Better and Oral Is the New IV

Kusha Davar,[1] Devin Clark,[1] Robert M. Centor,[2] Fernando Dominguez,[1] Bassam Ghanem,[3] Rachael Lee,[4] Todd C. Lee,[5] Emily G. McDonald,[6] Matthew C. Phillips,[7,8] Parham Sendi,[9] and Brad Spellberg[1]

Table 2. Summary of Randomized Controlled Trials of Oral vs IV-Only Therapy

Diagnosis	No. of RCTs Demonstrating IV > Oral	No. of RCTs Demonstrating Oral ≥ IV	References
Osteomyelitis	0	9 (all equal)	[103–111]
Bacteremia	0	10 (8 equal, 2 superior cure for oral)	[109, 112–120]
Endocarditis	0	3 (2 equal, 1 superior mortality for oral)	[121–123]

Davar K, Spellberg B et al. OFID (Link)

Table 1. Summary of Shorter Is Better Randomized Controlled Trials

Diagnosis	Short (d)	Long (d)	Result	No. of RCTs	Refs.
Community-acquired pneumonia	3–5	5–14	Equal	14	[32–45]
Atypical community-acquired pneumonia	1	3	Equal	1	[46]
Possible pneumonia in ICU	3	14–21	Equal	1	[47]
Ventilator-associated pneumonia	8	15	Equal	2	[48, 49]
Complicated UTI/pyelonephritis	5 or 7	10 or 14	Equal	9	[50–58]
Complicated intra-abdominal infection	4–8	10–15	Equal	2	[59, 60]
Gram-negative bacillus bacteremia	7	14	Equal	3	[61–63]
Cellulitis/wound/abscess	5–6	10	Equal	4	[64–67]
Osteomyelitis	42	84	Equal	2	[68, 69]
Osteomyelitis s/*P* implant removal	28	42	Equal	1	[70]
Diabetic osteomyelitis s/*P* Debridement	10–21	42–90	Equal	2	[71, 72]
Septic arthritis	14	28	Equal	1	[73]
Acute exacerbations of bronchitis and sinusitis	≤5	≥7	Equal	>25	[74–81]
Neutropenic fever	AFx72 h/3d	ANC > 500/9d	Equal	2	[82, 83]
Perioperative prophylaxis	0–1	1–5	Equal	56	[84–88]
Plasmodium vivax malaria	7	14	Equal	1	[89]
Erythema migrans (Lyme disease)	7	14	Equal	1	[90]

Abbreviations: ANC, absolute neutrophil count; d, day; h, hour; ICU, intensive care unit; RCT, randomized controlled trial; Refs., references; UTI, urinary tract infection.

Davar K, Spellberg B et al. OFID (Link)

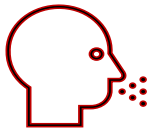
Acute Rhinosinusitis

Viral Rhinosinusitis

- Viruses account for 90-98% of all cases of rhinosinusitis
- Do not require antibiotics for treatment
- Common organisms: rhinovirus, adenovirus, influenza virus, and parainfluenza virus

Bacterial Rhinosinusitis

- Rare; prevalence of a bacterial infection during acute rhinosinusitis is 2–10%
- Common organisms: *Streptococcus pneumoniae, Haemophilus influenzae,* and *Moraxella catarrhalis*

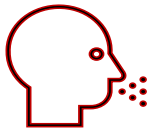


Upper Respiratory Infections

IDSA Rhinosinusitis Guidelines, 2012

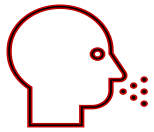
Acute Rhinosinusitis

Concern for acute bacterial rhinosinusitis should occur if:	
PERSISTENCE	Symptoms persist ≥ 10 days after start of URI
SEVERE	URI onset with high fever (≥39°C [102°F]) **AND** purulent nasal discharge or facial pain for at least 3-4 consecutive days
DOUBLE-SICKENING	Initial improvement followed by worsening of symptoms



Upper Respiratory Infections

IDSA Rhinosinusitis Guidelines, 2012



Upper Respiratory Infections

Precise estimation of symptoms onset verified to meet >3-4 days duration if severe or >10 days if persistent?

NO

Watchful Waiting or Delayed Prescribing + Symptomatic Treatment

YES

Severe Penicilin or Beta-Lactam Allergy?

YES

Doxycycline 100 mg PO BID x 5-7 days + symptomatic treatment

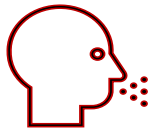
NO

Amoxicillin/clavulanic acid 875/125 mg PO BID x 5-7 days + symptomatic treatment

Notes

- Azithromycin is not recommended for empiric therapy due to high rates of resistance among *S. pneumoniae*
- Second- and third-generation oral cephalosporins are no longer recommended for empiric monotherapy owing to variable rates of resistance among *S. pneumoniae*
- TMP/SMX is not recommended for empiric therapy due to high rates of resistance among both *S. pneumoniae* and *H. influenzae*

IDSA Rhinosinusitis Guidelines, 2012



Upper Respiratory Infections

IDSA Rhinosinusitis Guidelines, 2012

Beta Lactams >> Respiratory FQs

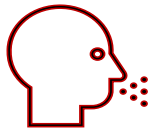
Table 8. Efficacy of Fluoroquinolones Compared to a β-Lactam for the Treatment of Acute Bacterial Rhinosinusitis

	Illustrative Comparative Risks[a] (95% CI)					
	Assumed Risk	Corresponding Risk				
Outcomes	β-Lactam	FQ	Relative Effect, OR (95% CI)	No of Participants (No. of Studies)	Quality of the Evidence (GRADE)	Reference
Clinical response follow-up: 10–31 days	Study population (low-risk)		1.09 (.85–1.39)	2133 (5 studies)	⊕⊕⊕⊖ moderate[b,c,d,e]	Karageorgopoulos et al [115]
	861 per 1000	871 per 1000 (840–896)				

8 RCTs where BLs were non-inferior to Resp FQs

1. Higher *C difficile* risk

2. Black Box Warnings on FQs: QTc prolongation, tendon rupture, AA rupture, hypoglycemic coma



Upper Respiratory Infections

No ABX for Acute Bronchitis!!!

Make sure to rule out

- Pneumonia
- Asthma
- Influenza
- COVID-19 infection
- Pertussis
- Acute exacerbations of chronic bronchitis

Dialogue Around Respiratory Illness Treatment (Link)

Bronchitis is viral – no role for ABX

Resources

To Post

For Patients

Symptom Relief for Viral Illnesses ("Prescription Pad")

Viruses or Bacteria
What's got you sick?

BE ANTIBIOTICS AWARE

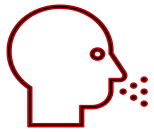
SMART USE, BEST CARE

Common Respiratory Infections	Common Cause			Are Antibiotics Needed?
	Virus	Virus or Bacteria	Bacteria	
Common cold/runny nose	✓			No
Sore throat (except strep)	✓			No
COVID-19	✓			No
Flu	✓			No
Bronchitis/chest cold (in otherwise healthy children and adults)*		✓		No*
Middle ear infection		✓		Maybe
Sinus infection		✓		Maybe
Strep throat			✓	Yes
Whooping cough			✓	Yes

* Studies show that in otherwise healthy children and adults, antibiotics for bronchitis won't help patients feel better.

CS320461-A

To learn more about antibiotic prescribing and use, visit www.cdc.gov/antibiotic-use.



Upper Respiratory Infections

Symptom Relief for Viral Illnesses

BE ANTIBIOTICS AWARE
SMART USE, BEST CARE

1. DIAGNOSIS

- ○ Cold or cough
- ○ Middle ear fluid (Otitis Media with Effusion, OME)
- ○ Flu
- ○ Viral sore throat
- ○ Bronchitis
- ○ Other:

You have been diagnosed with an illness caused by a virus. Antibiotics do not work on viruses. When antibiotics aren't needed, they won't help you, and the side effects could still hurt you. The treatments prescribed below will help you feel better while your body fights off the virus.

2. GENERAL INSTRUCTIONS

- ○ Drink extra water and fluids.
- ○ Use a cool mist vaporizer or saline nasal spray to relieve congestion.
- ○ For sore throats in older children and adults, use ice chips, sore throat spray, or lozenges.
- ○ Use honey to relieve cough. Do not give honey to an infant younger than 1.

3. SPECIFIC MEDICINES

- ○ Fever or aches:
- ○ Ear pain:
- ○ Sore throat and congestion:

Use medicines according to the package instructions or as directed by your healthcare professional. Stop the medication when the symptoms get better.

4. FOLLOW UP

- ○ If not improved in ____ days/hours, if new symptoms occur, or if you have other concerns, please call or return to the office for a recheck.
- ○ Phone:
- ○ Other:

Signed: _____

To learn more about antibiotic prescribing and use, visit **www.cdc.gov/antibiotic-use.**

CDC

Source: CDC (link)

Case

- 65 y/o M with HTN, CAD who presented with 3 days of congestion, fever, sore throat and mild shortness of breath with exertion
- Temp: 38.1^{o}C P 90 BP 125/80 O_2 Sat: 93%
- Gen: alert, oriented
- HEENT: +mild pharyngitis, no tonsilar exudates
- Neck: no stiffness, full ROM
- Lungs: no tachypnea, speaking in full sentences, no rales
- Heart: mild tachycardia, no m/r/g
- Ext: no LE edema, 1+ pulses bilat UE/LE

- Adenovirus
- Coronavirus (229E, HKU1, NL63, OC4
- SARS-CoV-2
- Metapneumovirus
- Rhinovirus/Enterovirus
- Influenza A (including H1, H1-2009, H3
- Influenza B
- Parainfluenza (1-4)
- Respiratory Syncytial Virus (A and B)
- *Chlamydia pneumoniae (bacteria)*
- *Mycoplasma pneumoniae (bacteria)*

Which Infections?

Resources for Current Resp Viral Activity in NM and U.S.

TriCore
Resp Viral Data

NM DOH
Influenza/Resp Viral Dashboard

CDC
RespNET
Flu View
NRVSS (ED)
NRVSS for other viruses
Enteroviral Surveillance

Case Continued

- Point of Care returns with positive result for COVID-19

- Current medications include:
  - Atorvastatin
  - Lisinopril
  - Metoprolol
  - ASA 81mg
  - Multivitamin

COVID-19 Treatment – Who?

Patients at Higher Risk for Disease Progression	
• > 65 years old • Asthma • Cancer • Cerebrovascular disease • Chronic kidney disease • Chronic lung disease • Chronic liver disease • Cystic fibrosis • Diabetes mellitus, type 1 and type 2	• Physical or Cognitive Disabilities • Heart disease • Immunosuppressive conditions or medications • Mental health disorders • Dementia • Obesity (BMI ≥30 kg/m2 or ≥95th percentile in children) • Pregnancy and recent pregnancy • Physical inactivity • Smoking, current and former

IDSA and NIH Guidelines

NOTE: Last update by NIH was issued this year (2024)

Current Recommendations with Evidence

NIH		IDSA	
Medication	Recommendation/ Evidence	Medication	Recommendation/ Evidence
Nirmatrelavir/Ritonavir (Paxlovid)	AIIa (Strong, Mod)	Nirmatrelavir/Ritonavir (Paxlovid)	Conditional, Low Certainty
Remdesivir	BIIa (Mod, Mod)	Remdesivir	Conditional, Low Certainty
Molnupiravir	CIIa (Weak, Mod)	Molnupiravir (with NO other treatment options)	Conditional, Low Certainty
High titer COVID Convalescent Plasma (Immunocompromised)	Equipoise	High titer COVID Convalescent Plasma (with NO other treatment options)	Conditional, Low Certainty

Treatment Duration

3 days

Remdesivir (IV)

5 days

Paxlovid

Molnupiravir

No data on combination therapy

Other Drug Considerations

Outpatient COVID-19 Treatment Recommendations			
Therapeutic	**Dosing/Duration**	**Baseline Labs**	**Contraindications and Precautions**
THERAPY SHOULD BE INITIATED WITHIN 5 DAYS OF SYMPTOM ONSET			
Paxlovid* (Nirmatrelvir/Ritonavir) Link to EUA for providers Under EUA for **pediatric patients** who are 12 yrs. or older who weigh more than 40kg (88lbs)	**Standard Dosing** Nirmatrelvir 300mg / Ritonavir 100mg by mouth every 12 hours **Tablets**: 3 total per dose (6 per day) **Duration**: 5 days **Moderate Renal impairment Dosing** For eGFR ≥30 to < 60 mL/min: 50% dose reduction of nirmatrelvir component (1 tab instead of 2)	Consider LFTs, if underlying liver disease Reassessment of renal function depends upon clinical judgement regarding stability of underlying renal disease	**Contraindications** - Severe renal impairment (eGFR < 30 mL/min) - Severe hepatic impairment (Child-Pugh Class C) - Uncontrolled HIV infection (risk for developing resistance to ritonavir) **Precautions** - How to manage drug-drug interactions (IDSA Guidance, 5/2022) - Ritonavir impacts drugs dependent on CYP3A for clearance and some of potent CYP3A inducers. - For Pregnant Women: Recommend shared decision-making with patient. **For questions, discuss with Maternal Fetal Medicine** - For Breastfeeding Women: Recommend shared decision-making. Nirmatrelvir crosses into breastmilk; outcomes data limited to animal studies.

Molnupiravir*
 	
Link to EUA for providers
	Molnupiravir 800mg by mouth every 12 hours
	Duration: 5 days
		Consider pregnancy test for women of childbearing age	Molnupiravir is generally not recommended for use during pregnancy but if there are no other alternatives, **please consult Maternal-Fetal Medicine (MFM) regarding its use in pregnant patients.**
			
			Precautions
			- Breastfeeding: not recommended during treatment and for 4 days after the last dose.
			- **Counseling and documentation requirements for prescribers**
			  ○ Females of childbearing potential: counsel to use effective contraception for duration of treatment through 4 days after last dose.
			  ○ Males if sexually active + childbearing potential: contraception advised during treatment and for 3 months after last dose.

Corticosteroids	**If used**: Dexamethasone 6 mg PO x 10 days or until hypoxia resolves	None	Oral or inhaled steroids are generally NOT recommended for outpatient COVID-19 infection treatment

Paxlovid – Drug-Drug Interactions

Link to Liverpool interaction checker

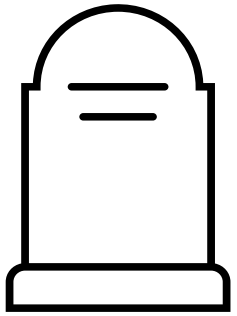
Management of Drug Interactions With Nirmatrelvir/Ritonavir (Paxlovid®): Resource for Clinicians

IDSA Infectious Diseases Society of America

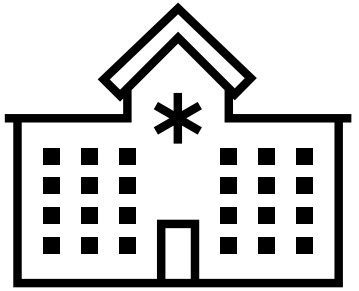
IDSA COVID-19 TREATMENT AND MANAGEMENT GUIDELINE PANEL ON BEHALF OF THE INFECTIOUS DISEASES SOCIETY OF AMERICA

Link with the HOW TO from IDSA

Impact of Nirmatrelavir/Ritonavir?

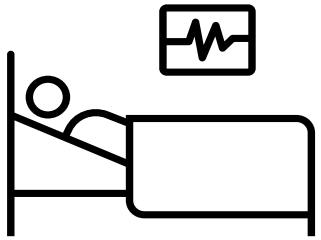


All-cause mortality may be lower in ambulatory patients (RR: 0.04 [95% CI: 0.00 - 0.69])



Fewer hospitalizations (RR: 0.12 [CI 0.06, 0.26])

Omicron?
Vaccination/Infection Hx?



All-cause mortality may be lower among hospitalized patient (RR: 0.63 [CI 0.21, 1.86])

No impact on mech vent or LOS

IDSA COVID-19 Guidelines

Influenza Treatment – Who?

A. Antiviral treatment is recommended as early as possible for any patient with confirmed or suspected influenza who have severe, complicated, or progressive illness or is at higher risk for influenza complications

Table 2. Persons at high risk for influenza complications

- Age < 2 years or ≥ 65 years
- Chronic pulmonary disease, including asthma
- Hemodynamically significant cardiac disease, excluding hypertension alone
- Immune comprised (e.g., patients with HIV or those on immunosuppressive therapy)
- Hematological disorders, including sickle cell anemia
- Renal or hepatic dysfunction
- Metabolic dysfunction, including diabetes mellitus
- Neuromuscular disorders, seizure disorders, residual of CVA, or cognitive dysfunction that may compromise handling of respiratory secretions
- Pregnancy (all trimesters), or post-partum (within 2 weeks after delivery)
- Long-term aspirin or salicylate-containing therapy in persons < 19 years of age
- American Indians or Alaska Natives
- Morbidly obese patients (BMI ≥ 40)
- Residents of nursing homes or other chronic care facilities

CDC Influenza Treatment Guidelines

Influenza Treatment – With What?

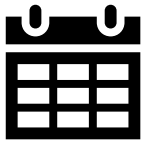
Oseltamivir

Table 3. Adult Influenza Treatment and Chemoprophylaxis (≥13 year of age) - Oseltamivir		
Renal Function (CrCl)	**Treatment Duration = 5 days**	**Chemoprophylaxis Duration = 7 days**
≥60 mL/min	75 mg twice daily	75 mg once daily
>30 to <60 mL/min	75 mg × 1 dose, then 30 mg twice daily	30 mg once daily
>10 to 30 mL/min	30 mg once daily	30 mg every other day
≤10 mL/min or Hemodialysis	30 mg every other day (post-HD)	30 mg once weekly
Peritoneal Dialysis	Single dose of 75 mg	30 mg immediately, then 30 mg administered after dialysis exchange once weekly

CDC Influenza Treatment Guidelines

Influenza Treatment – Timing? Duration?

Best impact within 48 hours of symptom onset



5 days
No evidence for extending duration even in immunocompromised or ICU patients

CDC Influenza Treatment Guidelines

What other Antivirals Exist for Flu?

Baloxavir	Oral 1 dose	Outpatient	Contraindications: Immunocompromised hosts
Zanamavir	Inhaled BID x 5 days	Outpatient	Contraindications: Asthma, COPD Not for severe influenza
Peramivir	IV 1 dose	Inpatient	Only for patients who cannot tolerate oral or inhaled agents

CDC Influenza Treatment Guidelines

How Common Are Coinfections?

Not Frequent: Bacterial Coinfections with Respiratory Viral Infections

- Among patients hospitalized with COVID-19 Infection, **only 3 – 5%** with bacterial coinfection (Link)
- YET: 70% of patients with COVID-19 infection received at least 1 dose of ABX during hospitalization (Link)

- Influenza with bacterial coinfection (Link)
  - 0.5% (healthy young individuals)
  - Up to 2.5% (older individuals and those with predisposing conditions)

Take home point: Bacterial coinfections NOT common and typically present with more severe illness

Community Acquired Pneumonia (CAP)

Streptococcus pneumoniae
Haemophilus influenzae
Respiratory viruses (e.g., influenza, COVID-19)
Atypical pathogens (e.g., *Chlamydophila pneumoniae, Mycoplasma pneumoniae)*

Table 1: CAP Pathogens Associated with Certain Conditions

Alcoholism	*S. pneumoniae*, oral anaerobes (aspiration), *Klebsiella pneumoniae*
COPD and/or smoking	*S. pneumoniae, H. influenzae, Moraxella catarrhalis, C. pneumoniae, Legionella* species, *Pseudomonas aeruginosa*
HIV infection	*S. pneumoniae, H. influenzae, M. pneumoniae, P. aeruginosa,* fungal species, atypical pathogens, *Pneumocystis jirovecii*
Active influenza infection	Influenza, *S. pneumoniae, H. influenzae, Staphylococcus aureus*

IDSA CAP Guidelines, 2019

How Do You Treat CAP?

ABX and Duration?

CAP Treatment

	Standard Regimen
No comorbidities or risk factors for MRSA or *Pseudomonas aeruginosa*[*]	Amoxicillin or doxycycline or macrolide (if local pneumococcal resistance is <25%)[†]
With comorbidities[‡]	Combination therapy with amoxicillin/clavulanate or cephalosporin AND macrolide or doxycycline[§] OR monotherapy with respiratory fluoroquinolone[‖]

No Less than
5 Days of Therapy

Guided by:

- Clinical stability (resolution vital abnormalities)
- Ability to eat
- Normal mentation

Strong recommendation, moderate quality of evidence

When Worry About Asymptomatic Bacteriuria?

Clinical Infectious Diseases

IDSA FEATURES

Clinical Practice Guideline for the Management of Asymptomatic Bacteriuria: 2019 Update by the Infectious Diseases Society of America[a]

Lindsay E. Nicolle,[1] Kalpana Gupta,[2] Suzanne F. Bradley,[3] Richard Colgan,[4] Gregory P. DeMuri,[5] Dimitri Drekonja,[6] Linda O. Eckert,[7] Suzanne E. Geerlings,[8] Béla Köves,[9] Thomas M. Hooton,[10] Manisha Juthani-Mehta,[11] Shandra L. Knight,[12] Sanjay Saint,[13] Anthony J. Schaeffer,[14] Barbara Trautner,[15] Bjorn Wullt,[16] and Reed Siemieniuk[17]

What IS Asymptomatic Bacteriuria?

- ≥ 10^5 CFUs/mL of ≥ 1 or more bacteria in urine culture

- **No signs/symptoms of UTI**
  - No dysuria
  - No urinary frequency
  - No urgency
  - No fever
  - No flank pain/CVA tenderness

Screening & Treating Asymptomatic Bacteriuria

Advised	Not advised	No guidance
• Pregnant women • Rarely in renal transplant patients • Endoscopic urologic procedures associated with mucosal trauma	• Patients with organ transplants other than kidney	• Patients with high risk neutropenia • Patients on biologic agents

https://www.idsociety.org/practice-guideline/asymptomatic-bacteriuria/

Urinalysis Interpretation

Table 2. Urinalysis (UA) Interpretation[3,4]

UA Component	Normal Value	Interpretation
pH	5.5 – 6.5 (Range: 4.5 – 8.0)	Alkaline urine in a patient with UTI suggest the presence of a urea-splitting pathogen
Nitrites	None	• Present when bacteria reduce urinary nitrates to nitrites (e.g. coliform bacteria) • Test is specific but not highly sensitive (negative result does not rule out a UTI)
Leukocyte Esterase (LCE)	None	• Produced by neutrophils and may signal pyuria associated with UTI • Other causes of sterile pyuria include: balanitis, urethritis, bladder tumors, nephrolithiasis, foreign bodies, exercise, glomerulonephritis, and corticosteroid or cyclophosphamide use
Squamous (epithelial) cells	None	In general, if squamous cells are >20, then this indicates contamination
WBCs (leukocytes)	Men: ≤ 2 Women: ≤ 5	• Pyuria is evidence of inflammation in the genitourinary tract; it alone is not sufficient to diagnose bacteriuria or treat for infection • WBCs ≥ 10 cells/hpf may indicate UTI
Bacteria or yeast	None	May be normal genital microbial flora, contaminants, or sign of infection

ASB in Pts with Autoimmune Rheum Diseases

- 260 female patients with ARD
- Majority on immunosuppression (93%)
- 1 yr follow up

- 24 with ASB
- 9 persistently with ASB, 11 intermittently
- 4 went on to develop UTI

Link

Questions to Improve ABX Prescribing

Empiric ABX selection: OK to **go narrow?**

- Syndrome
- Recent **ABX**

Can I **narrow** now?

Can I change from **IV to oral** ABX?

Can I **stop antibiotics altogether?**

- Duration based on syndrome/infection type
- Lack of evidence for bacterial infection

Do I need **prophylaxis?** How long?

Updated ABX Stewardship Training – CDC (Link)

Flu Vaccines, 2024 – 2025 Season

- Trivalent
- High dose and adjuvanted recommended for
  - Adults 65 yrs and older
  - NEW: Solid organ transplant patients 18 – 64 yrs
- No reason to exclude patients with egg allergies
  - Very LOW likelihood of reaction based on negligible egg protein amounts
  - Key point: Ability to manage **any** severe reaction where vaccines are administered
- Timing: Sept/Oct

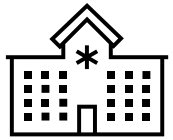
ACIP Recommendations

Silver Lining of COVID-19 Pandemic?

Flu B – Yamagata lineage
not causing infections

So what?
Back to Trivalent
Vaccine

Effectiveness of Flu Vaccine Last Season?

	Outpatient Visits	Hospitalizations
		
Adults >=18 yrs	33 – 49% Less	41 – 44% Less

Link to MMWR

RSV Vaccines

- All adults aged ≥ 75 years recommended to receive a single dose of an RSV vaccine, Arexy or Abrysvo
- Adults ages 60–74 who are at increased risk of severe RSV
  - Chronic heart/lung disease, weakened immune system, “severe” obesity or diabetes
  - Live in a nursing home
- Single dose of vaccine
- No booster recommended at this time
- Covered under Medicard Part D (like Shingrix)

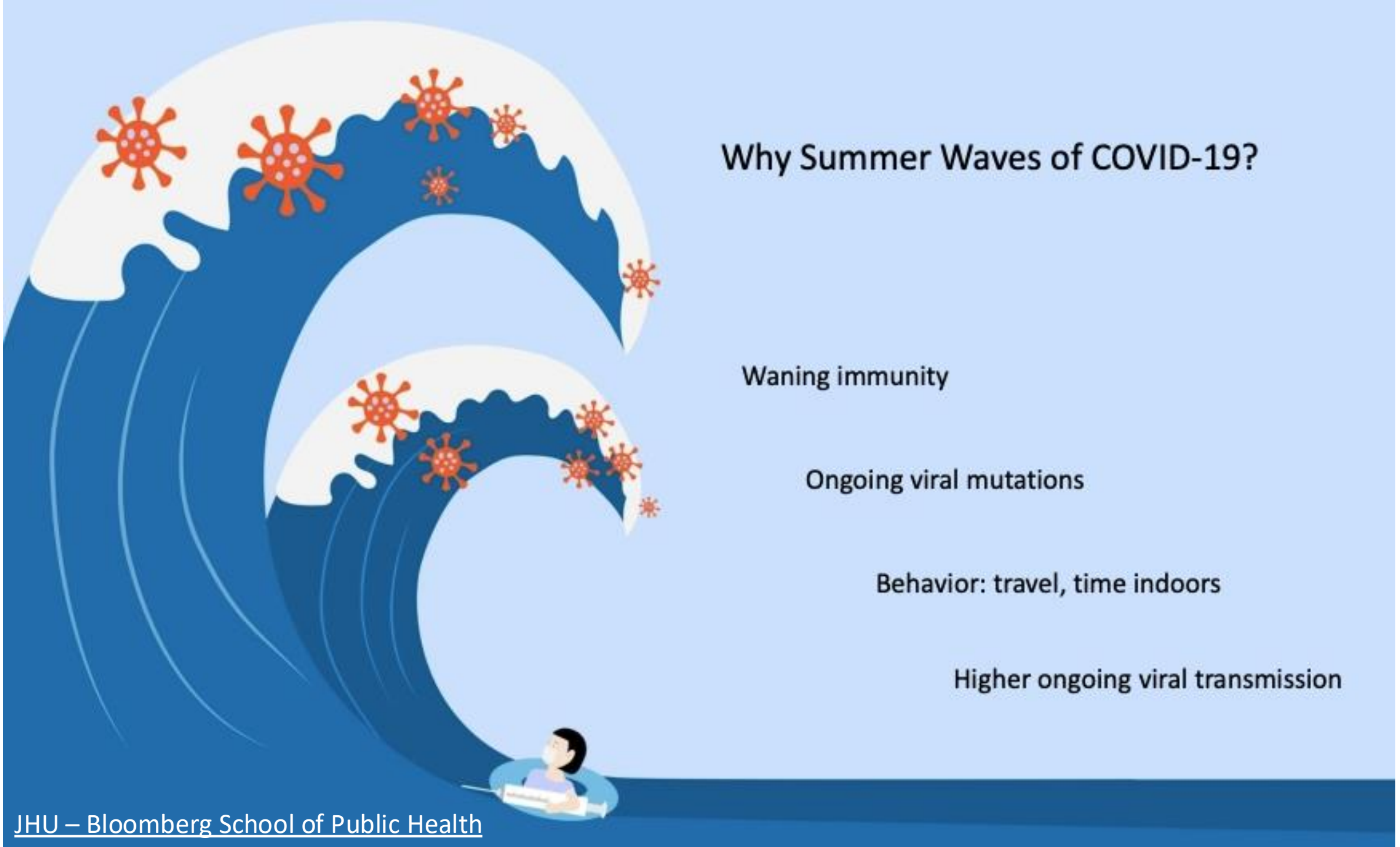
- Pregnant adults: Abrysvo has been FDA approved for use between 32 - 36 weeks pregnant, to pass antibodies to the fetus
- Covered by insurance

RSV Vaccine Details

- Arexy (GSK)
  - Season 1 efficacy: 83%
  - Season 2 efficacy: 58%
  - Combined efficacy: 75%
  - Severe RSV efficacy: 94%
- No booster effect at 12 months with 2nd dose

- Abrysvo (Pfizer)
- *Older adults*:
  - Combined efficacy: 84%
  - No severe RSV cases occurred in vaccine group
- *Pregnant women*:
  - Severe RSV efficacy in infants (mom immunized at 32-36 weeks)
  - 90 days: 91.1%
  - 180 days: 76.5%

ACP Summary 2023



JHU – Bloomberg School of Public Health

Interim Clinical Considerations for Use of COVID-19 Vaccines in the United States

- All individuals 6m and above recommended to receive updated vaccine
- 2024-2025 options
  - mRNA vaccines (2)
  - Protein subunit vaccine
- All adult vaccines FDA approved
- No preference for 1 type of vaccine above another

- NOTE: 2023–2024 Moderna, Novavax, and Pfizer-BioNTech COVID-19 vaccines are no longer recommended and should not be used

CDC.ACIP Guidelines – Sept 6, 2024

Emphasized For…

- People ages 65 years and older
- People with underlying medical conditions*, including immune compromise
- People living in long-term care facilities
- Pregnant people to protect themselves and their infants

*Underlying Medical Conditions (CDC)

Moderate or Severely Immunocompromised

- Active treatment for solid tumor or hematologic malignancies
- Hematologic malignancies associated with poor responses to COVID-19 vaccines (CLL, NHL, acute leukemia, MM)
- Solid organ transplant
- Receipt of chimeric antigen receptor (CAR)-T-cell therapy or hematopoietic cell transplant (HCT)
- Moderate or severe primary immunodeficiency (CVID)
- Advanced HIV infection (people with HIV and CD4 cell counts less than 200/mm^3, history of an AIDS-defining illness without immune reconstitution, or clinical manifestations of symptomatic HIV) or untreated HIV infection
- Active treatment with immunosuppression including high dose steroids, akylating agents, anti-B cell agents

Ages 12 & Up

Initial COVID vaccination

- Ages 12 years and older
  - 1 dose of 2024–2025 Moderna **OR**
  - 1 dose of 2024–2025 Pfizer-BioNTech **OR**
  - 2 doses of 2024–2025 Novavax

Received previous COVID vaccination

- Ages 12 years and older
  - 1 dose of 2024–2025 Moderna **OR**
  - 1 dose of 2024–2025 Pfizer-BioNTech **OR**
  - 1 dose of 2024–2025 Novavax

CDC.ACIP Guidelines – Sept 6, 2024

Extended Interval

- Applies only to Novavax for initial series (2 doses)
- Range for dosing interval: 3 – 8 weeks
- Reduces rare risk for myocarditis and pericarditis
- Highest risk group: Males 12 – 39 years

Moderate or Severely Immunocompromised Patients

Initial Vaccination

- Ages 12 years and older
  - 3 doses of 2024–2025 Moderna **OR**
  - 3 doses of 2024–2025 Pfizer-BioNTech **OR**
  - 2 doses of 2024–2025 Novavax

Received previous doses of a COVID-19 vaccine

- Recommended COVID-19 vaccine and number of 2024–2025 doses are based on age and vaccination history

Additional doses: People who are moderately or severely immunocompromised ages 6 months and older may receive 1 or more age-appropriate additional doses of a 2024–2025 COVID-19 vaccine.

CDC.ACIP Guidelines – Sept 6, 2024

Other Guidance for Immunocompromised Patients

- Transplant or CAR-T-cell therapy?
  - Revaccinate at least 3 months (12 weeks) after
  - Follow recommended schedule for unvaccinated
- Vaccinated while on B-cell-depleting therapies (e.g., rituximab, ocrelizumab)?
  - Short-term administration: revaccinate 6m after dose
  - Ongoing administration: 4 weeks prior to next dose
- Ongoing immunosuppression?
  - 2 weeks prior to initiation or resumption
- Pemivibart for COVID-19 prophylaxis?
  - Wait to administer 2 weeks after last vaccine dose

CDC.ACIP Guidelines – Sept 6, 2024

"I Just Had COVID-19 Infection... When to Get Vaccinated?"

- May obtain as soon as no longer infectious OR
- May wait up to 90 days after infection

- Depends upon
  - Individual's risk with infection
  - Current COVID community transmission
  - Current variant circulating

CDC.ACIP Guidelines – Sept 6, 2024

Pemivibart

- Monoclonal for prevention in severely immunocompromised
- 1.5h infusion every 3 months
- Indications:
  - SOT and HSCT
  - Also:
    - Active treatment with high-dose corticosteroids (i.e., ≥20 mg prednisone or equivalent per day when administered for ≥2 weeks), alkylating agents, antimetabolites, transplant-related immunosuppressive drugs, cancer chemotherapeutic agents classified as severely immunosuppressive, and biologic agents that are immunosuppressive or immunomodulatory (e.g., B-cell depleting agents)

IDSA COVID Guidelines

Other Vaccine Considerations

- OK to administer flu + COVID-19 vaccines concurrently OR may also space out
- May also give RSV vaccine, if indicated (beware – adjuvanted!)
- Caveat: vaccines containing nonaluminum adjuvants (Shingrix, RSV, aIIV) – limited data about co-administration

- NOTE: patients may have more symptoms
- Important to get vaccines before flu and RSV start circulating

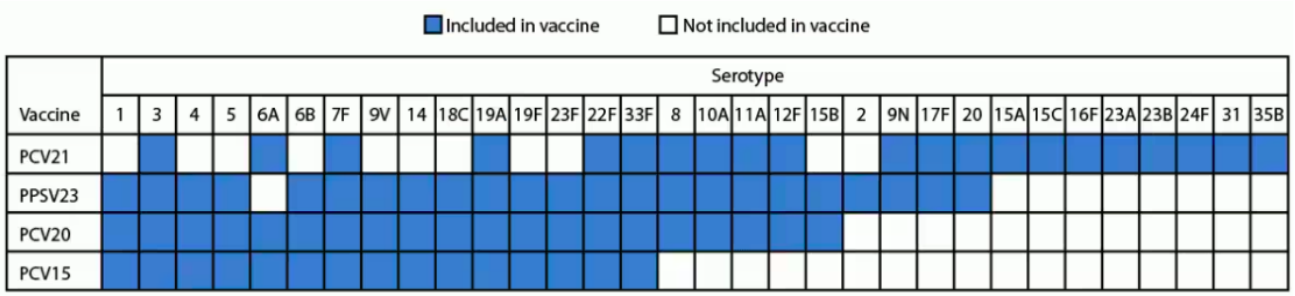
CDC – Resp Viral Vaccines

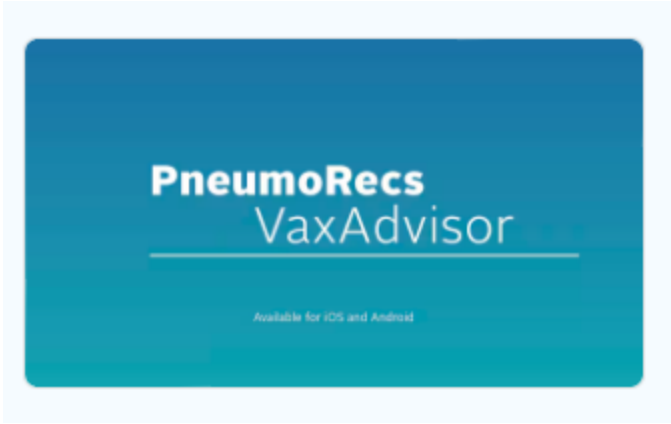
Pneumoccocal Vaccine Resources

- [Pneumococcal Vaccine Timing for Adults]
- [Pneumorecs Vaccine Advisor]

FIGURE. Serotypes*,† included in pneumococcal vaccines currently recommended for adults — United States, 2024

Return





Difference between PCV21, PCV 20 and PCV15

In Summary

- ABX are important resources: use when needed and consider shorter courses based on clinical response

- Prevent infections among your patients with vaccines!

Questions?