Vexed by a Virus: Viral Illnesses and Antimicrobial Stewardship

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Selected Epidemiology

Virus	Estimated burden in U.S.
Influenza	2021-2022 season 8 – 13 million infections 82,000 – 170,000 hospitalizations 5,000 – 14,000 deaths
RSV	2021 confirmed cases per CDC: 122,381
COVID-19	Total >90,000,000 reported cases >1,000,000 deaths


AN ANTIBIOTIC IS THE WRONG TOOL TO TREAT A VIRUS.
Make sure you use the right tool for the job.
Antibiotics save lives by treating certain infections caused by bacteria, not viruses like colds or flu. When they're not needed, antibiotics won't help you, and the side effects could still hurt you. Ask your doctor when an antibiotic is the right tool for your illness and when it's not.
To learn more about antibiotic prescribing and use, visit www.cdc.gov/antibiotic-use.

Viruses or Bacteria What's got you sick?

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.

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

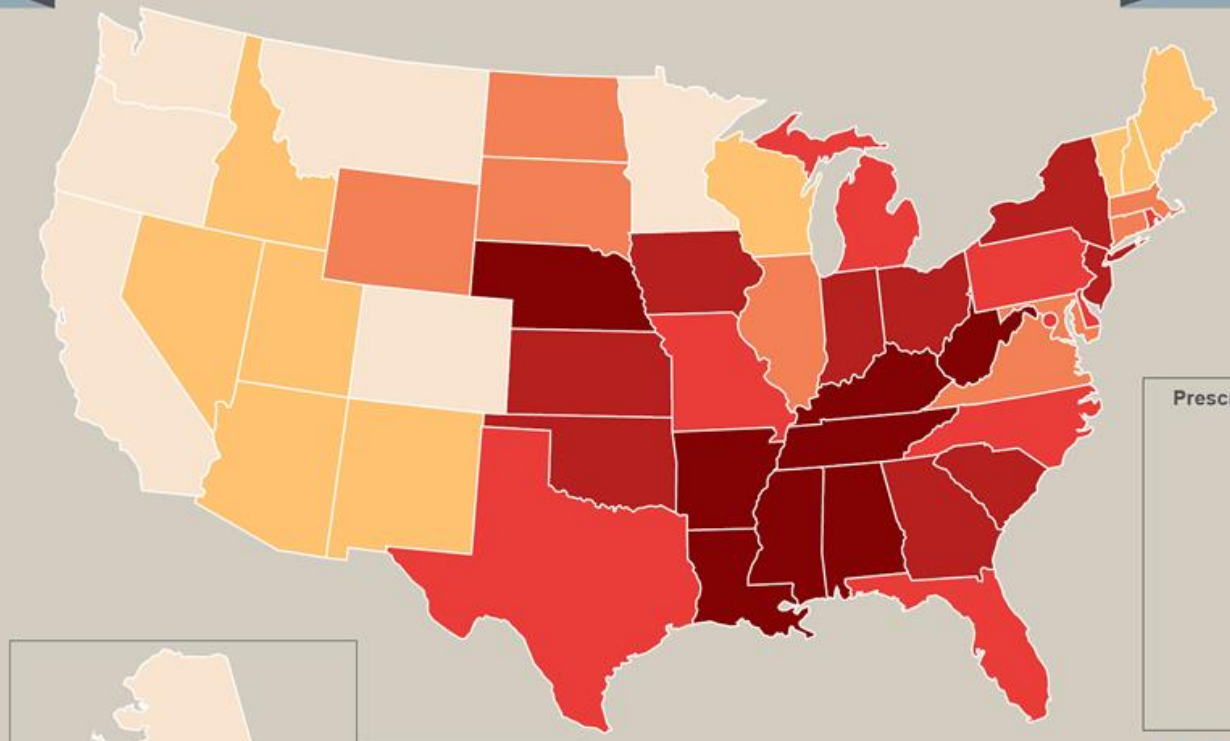
IDSA Guidelines

- How to differentiate viral vs bacterial rhinosinusitus is the FIRST question addressed in the 2012 IDSA guidelines
- Presentation typical of bacterial rhinosinusitis
  - Duration of symptoms >10 days more likely bacterial
  - Severe symptoms for >3 days at symptom onset
  - Worsening symptoms after initial improvement

IDSA Guidelines

- Community acquired pneumonia guidelines address influenza specifically
  - Suggest in confirmed influenza infection, antibiotics may be stopped after 2-3 days if the patient is:
    - Stable/improving
    - There is no evidence of a bacterial pathogen present

Community Antibiotic Prescriptions per 1,000 Population by State - 2019



BE ANTIBIOTICS AWARE
SMART USE, BEST CARE

Data source: IQVIA Xponent 2019

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Viral Illness in Kentucky

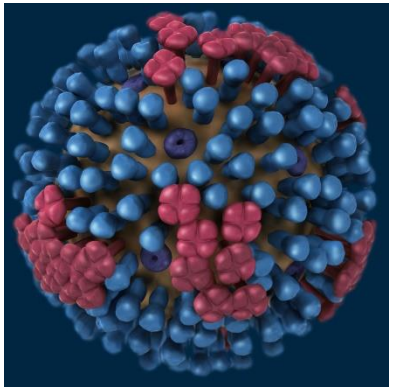
- Retrospective review of KY Medicaid claims July 1 1993 through June 30, 1994
  - Outpatient and ER visits for acute nasopharyngitis
  - 60% (1290/2171) visits resulted in an antibiotic fill
  - Adult patients and urban setting more likely to result in antibiotic prescriptions

Viral Illness in Kentucky

- Retrospective review of KY Medicaid claims in pediatric patients 2012 through 2017
  - Rural areas more likely to have antibiotics prescribed
  - In Eastern KY, antibiotic prescription to child ratio was 3:1
  - Most antibiotics prescribed by NPs and general practitioners
  - In 2017, estimated 45.9% of the prescriptions were appropriate

Influenza and Antimicrobial Stewardship

- Retrospective review of antibiotic initiation rates in influenza patients (compared two different influenza tests)
  - Antibiotics initiated in 51-67% of patients
  - Antibiotics initiated in 51% of patients in rapid PCR tested group



Influenza and Antimicrobial Stewardship

- Open-label randomized controlled trial in 2015 & 2016 flu seasons comparing rapid point-of-care testing vs standard
  - Antibiotics prescribed in 83% and 84%, respectively
  - Mean duration of antibiotics in both groups was ~7 days
  - Single dose of antibiotics was higher in rapid point-of-care group 17% vs 9%, $p<0.05$

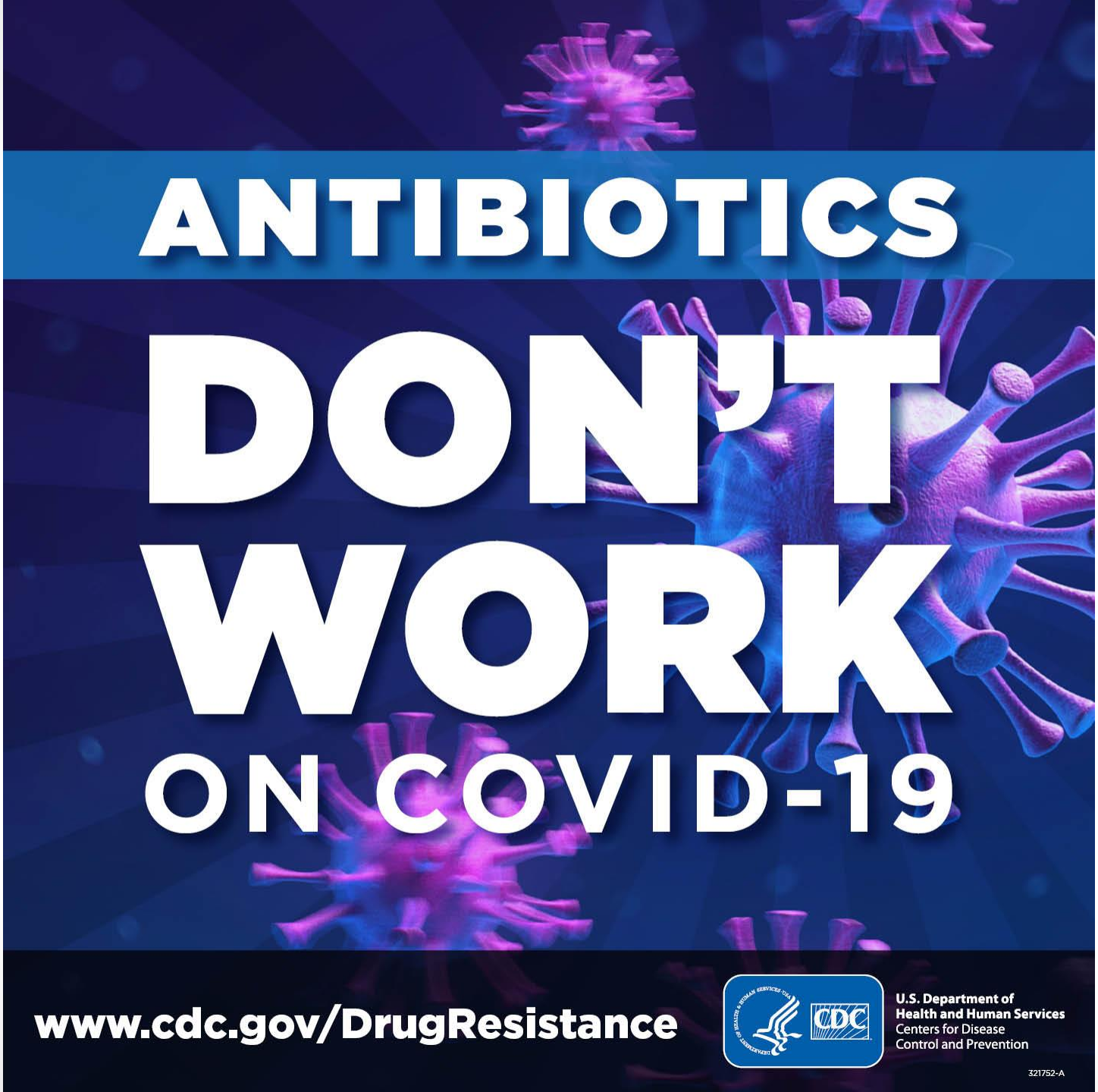
COVID-19 and Antimicrobial Stewardship

- Antimicrobial stewardship staff is reallocated to pandemic response
- Low rates of bacterial coinfection reported but high rates of antibiotic prescribing
  - Suggestive of widespread inappropriate antimicrobial use
- More burdensome isolation practices required
- Prescriber anxiety and burn-out may contribute

COVID-19 Pandemic and Antimicrobial Stewardship

- In 2022, the CDC reported that during the COVID-19 pandemic, progress against MDROs had been reversed

Organism	Trend 2019 to 2020
Carbapenem-resistant *Acinetobacter* (CRAB)	↑ 35%
Candida auris	↑ 60%
Carbapenem-resistant Enterobacterales (CRE)	↑ 35%
Extended spectrum beta-lactamase (ESBLs)	↑ 32%


ANTIBIOTICS
DON'T
WORK
ON COVID-19
www.cdc.gov/DrugResistance
U.S. Department of
Health and Human Services
Centers for Disease
Control and Prevention
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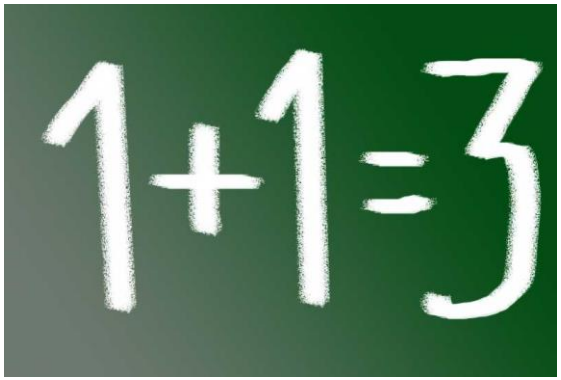
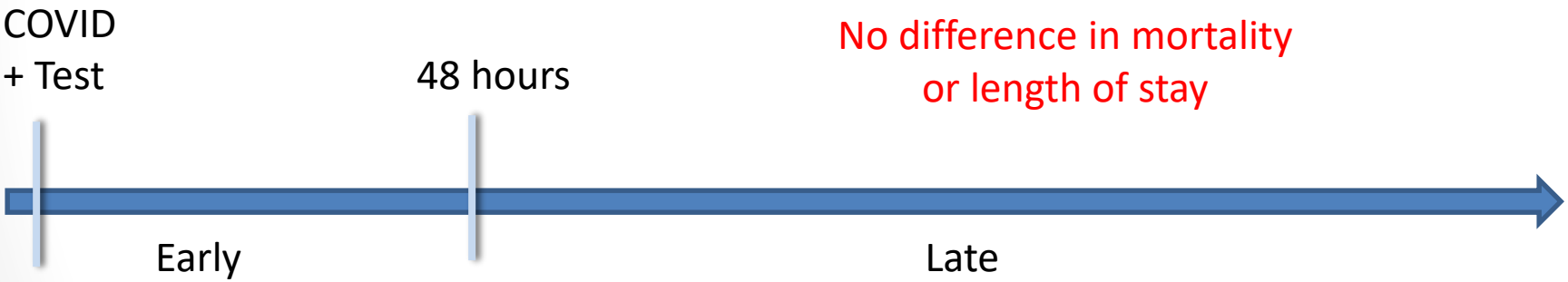
But can a patient have a viral & bacterial co-infection?

- COVID-19 and bacterial co-infection rates are reportedly <10%
- Antibiotics are reportedly prescribed in up to 84% of COVID-19 patients
- A survey of physicians found respondents believed COVID-19 patients needed an average 7 days of antibiotics



So is there any hope?

- Challenging the notion that antibiotics are needed in patients with viral illness can lead to behavior change
  - A retrospective study comparing early vs late antibiotic discontinuation in COVID-19 patients



  - Antimicrobial stewardship recommendation acceptance was more common in the early discontinuation arm (74% vs 54%, p=0.003)

Helpful differentiators

- Ways to differentiate in the inpatient setting
  - Procalcitonin <0.5 ng/dL
    - A study in critically-ill patients found that utilization of procalcitonin shorted duration of antibiotic therapy from 7 days to 5 days ($p<0.05$)
    - A separate study found that procalcitonin >0.5 ng/dL was poorly correlated with bacterial co-infection
  - Negative cultures

What can we all do?

- Set a good example
- Utilize evidence-based practice
- Educate peers
  - Possible harms associated with antibiotics
  - Threat of resistance

Questions?

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