

# Antibiotic Stewardship Practices during COVID-19

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# Disclosures

- I have no relevant disclosures or financial relationships with commercial entities producing healthcare related products or services

# Objectives

- Discuss challenges that the SARS-CoV-2 pandemic have presented to antimicrobial stewardship programs in the United States
- Describe opportunities for antimicrobial stewardship learned from the pandemic

## Antimicrobial (*an-ti-mī-'krō-bē-əl*)

destroying or inhibiting the growth of microorganisms and especially pathogenic microorganisms

## Stewardship (*'stü-ərd-,ship*)

the activity or job of protecting and being responsible for something

# Antimicrobial Stewardship – the Why

- Antibiotics are a shared resource
- Antibiotics are misused in hospitals – up to 50% of use is unnecessary or inappropriate
- Antibiotics are a leading cause of ED visits for medication related adverse events
- Overuse contributes to antibiotic resistance and the growing *C. difficile* problem
- Improving antibiotic use is a public health imperative

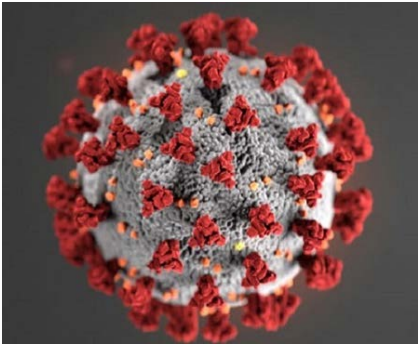
# The Challenges

# Barriers to Successful Stewardship in a Pandemic



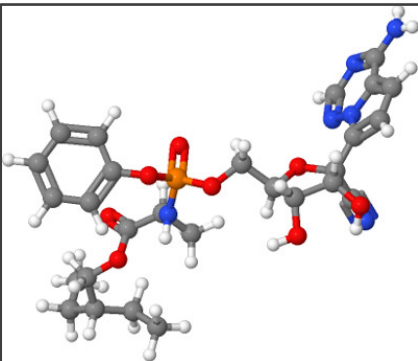
## Diagnostic Uncertainty

- Minimal aerosol generating procedures and PPE conservation



## Novelty of Disease State

- Rates of bacterial or fungal co-infection not well described



## Personnel Shifts

- Stewards redirected to other roles

# Local Experience – Diagnostic Uncertainty + Novel Disease State

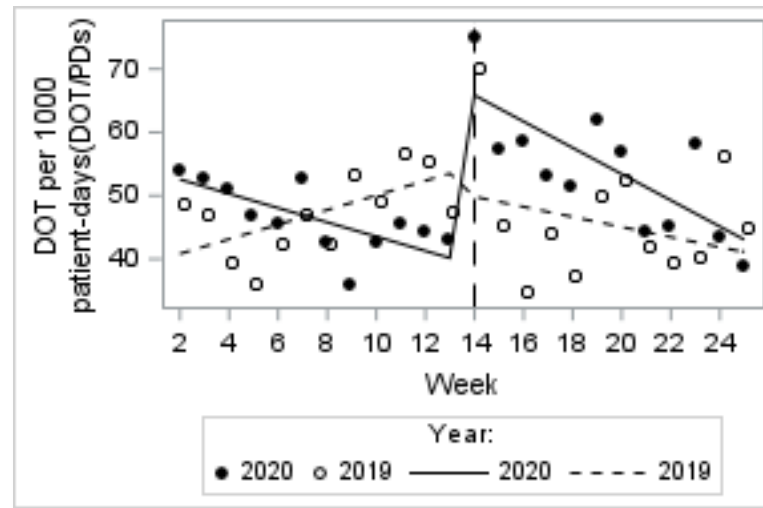
## Antibiotics for Bacterial Pneumonia in Patients with Confirmed COVID-19



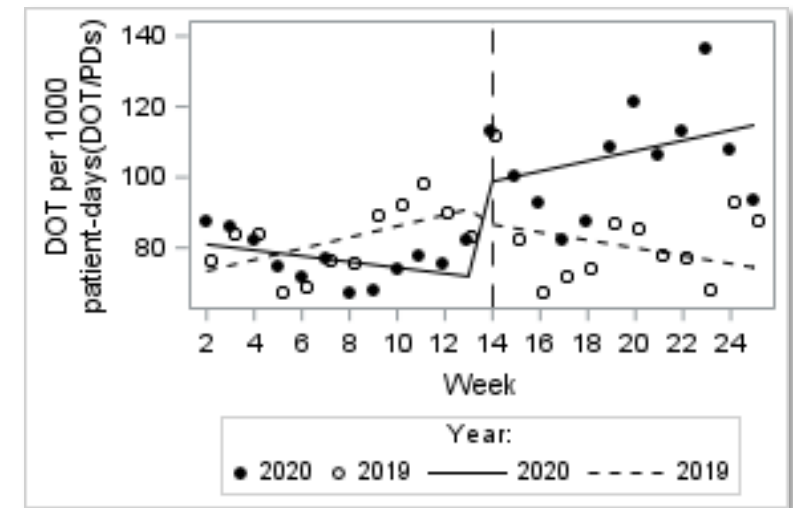
Respiratory viral panels



Sputum cultures, bronchoscopies



Within 7d of admission



Total



# Antimicrobial Use (AU) during COVID-19

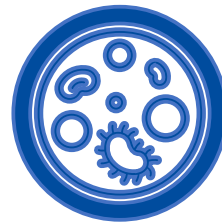


**3.5%**

Acute bacterial co-infection  
in COVID-19

**14.3%**

Secondary bacterial infection  
in COVID-19



**72%**

Patients received  
antibiotic therapy



**74%**

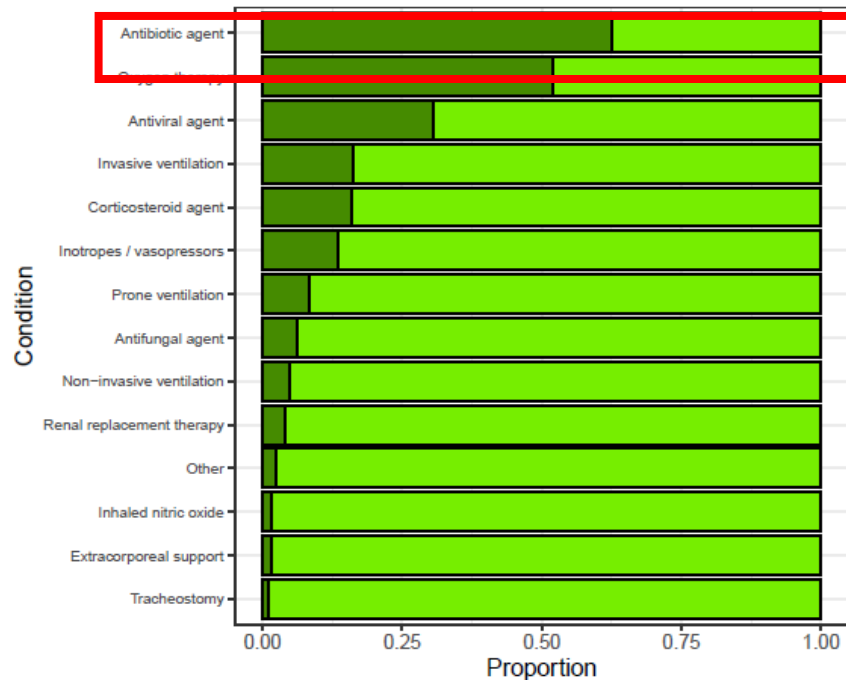
Antibiotics prescribed were  
fluoroquinolones & third-  
generation cephalosporins

# Antimicrobial Use (AU) during COVID-19

- International Severe Acute Respiratory and Emerging Infections Consortium (ISARIC) COVID-19 Report: 08 April 2020
  - 10,363 individuals from 240 sites across 25 countries
  - **62%** received antibiotics, **74.5%** among ICU patients

## Treatment

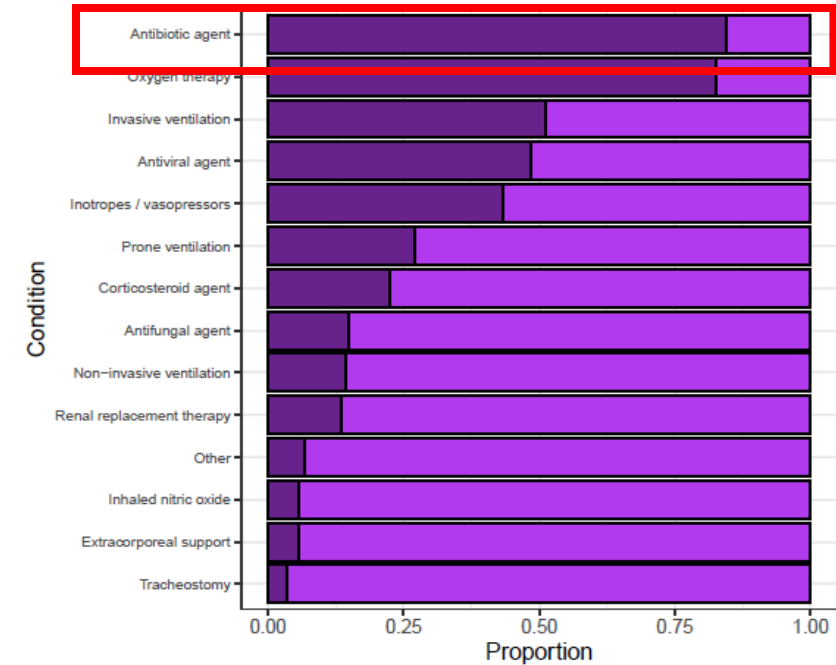
Figure 8: Treatments used. This only includes patients where this information was recorded



## Intensive Care and High Dependency Unit Treatments

These figures include only the 212 ICU/HDU patients with complete details of treatments.

Figure 10: Treatments used.



# Recommendations for Antibiotic Use in COVID-19

Guidelines	Antimicrobial Recommendations
National Institutes of Health	<ul style="list-style-type: none"> <li>-In patients with COVID-19 and severe or critical illness, there are insufficient data to recommend empiric broad-spectrum antimicrobial therapy in the absence of another indication. (BIII)</li> <li>-If initiated they should be reassessed daily in order to minimize adverse consequences. (AIII)</li> </ul>
World Health Organization	<ul style="list-style-type: none"> <li>-Mild COVID-19: Recommend against antibiotics</li> <li>-Moderate COVID-19: Recommend against antibiotics, unless there is clinical suspicion of a bacterial infection</li> <li>-Severe COVID-19: Recommend empiric antimicrobials to treat all likely pathogens, should be targeted to host factors and local epidemiology, and assessed daily for de-escalation</li> </ul>
Surviving Sepsis Campaign: Guidelines on the management of critically ill adults with COVID-19	<ul style="list-style-type: none"> <li>In mechanically ventilated patients with resp. failure, suggest use of empiric antimicrobials/antibacterial agents, over no antimicrobials (weak rec., low-quality evidence)</li> <li>-Re-evaluate for de-escalation daily</li> </ul>

# Local Experience – Personnel Shifts & Program Initiative Delays

## Day-to-Day Stewardship Activities

- Prospective audit and feedback of restricted antimicrobials
- Other stewardship alerts (e.g., positive blood culture review)



- Development and maintenance of COVID-19 Therapeutic Guidelines
- Clinical trial involvement
- Allocation of remdesivir
- Review and approval of other high-cost novel therapeutics (e.g., tocilizumab)

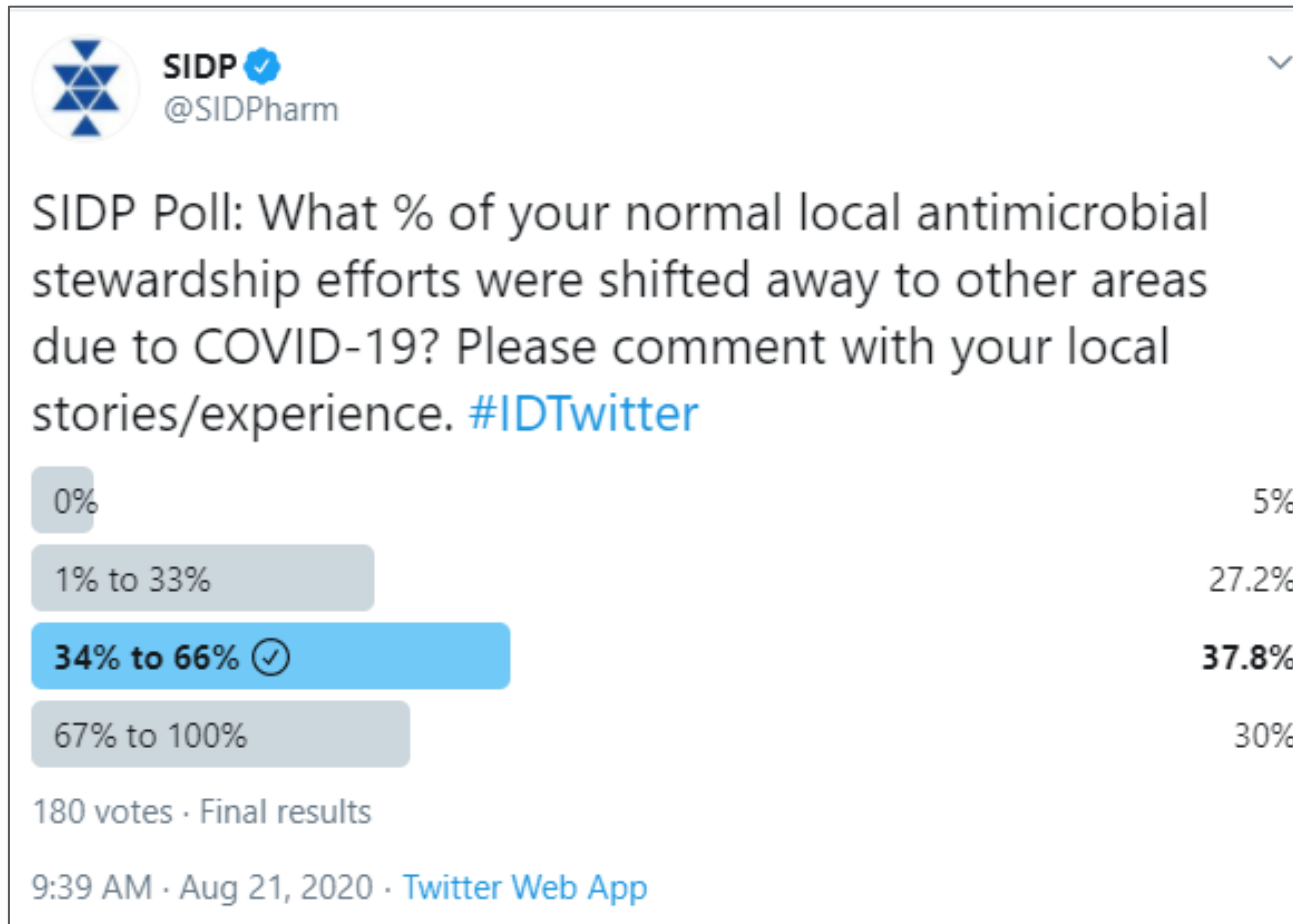
## Progress on Long-Term Goals

- Launch of new rapid technology for bloodstream infections in the microbiology laboratory
- Validation of susceptibility testing for novel antimicrobials and corresponding formulary reviews
- Monthly antimicrobial utilization reporting and annual antibiograms



- SARS-CoV-2 testing and reporting
- Shift to broad-spectrum, costly agents for PPE conservation

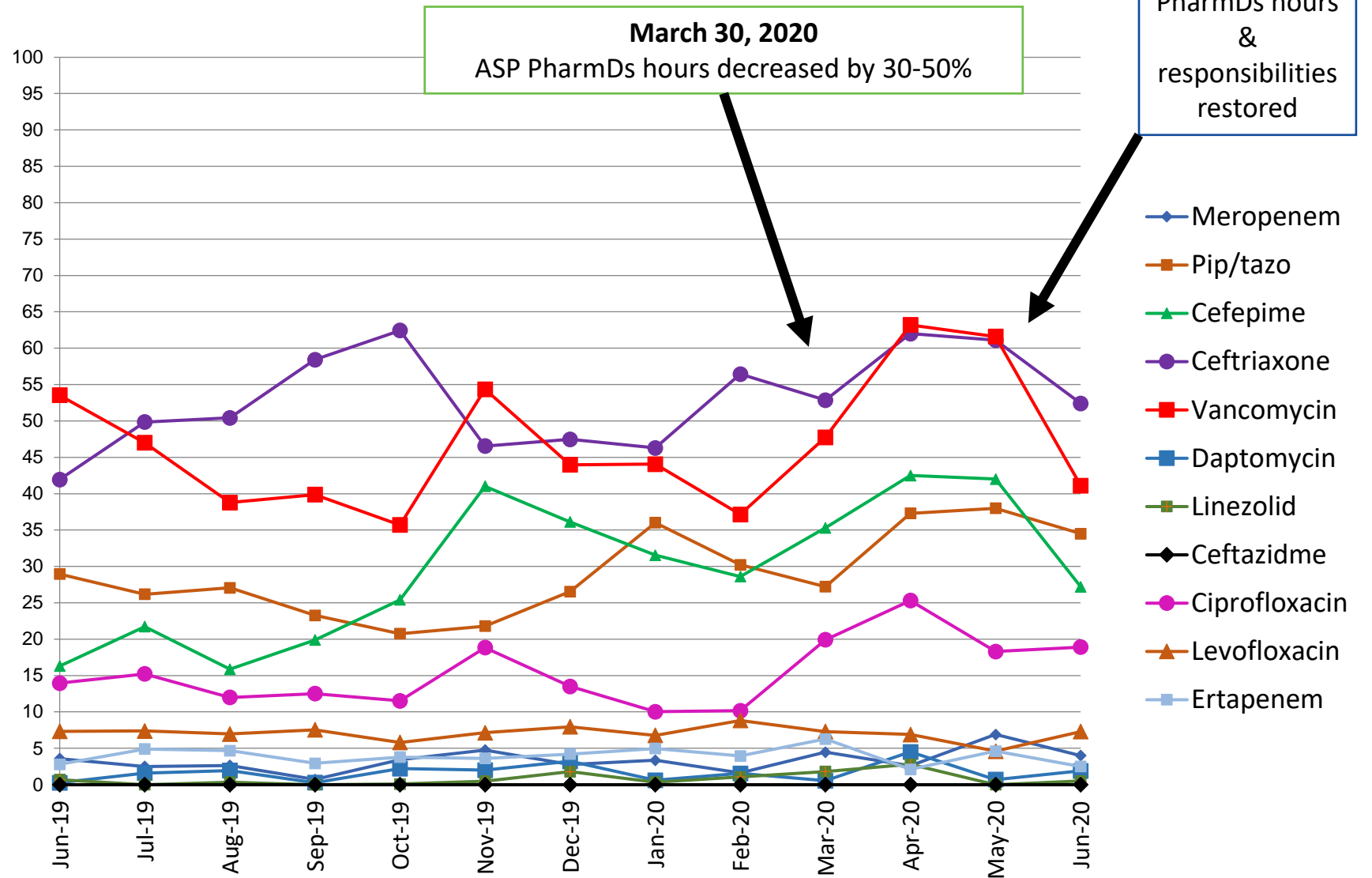
# ID Pharmacist Experience – Personnel Shifts & Program Initiative Delays



“Our usual tracking systems came to a halt. Extra hours went into treatment, active cases, clinical trials and EUA. There weren’t enough hours to catch up. Non-COVID initiatives came to a halt.”

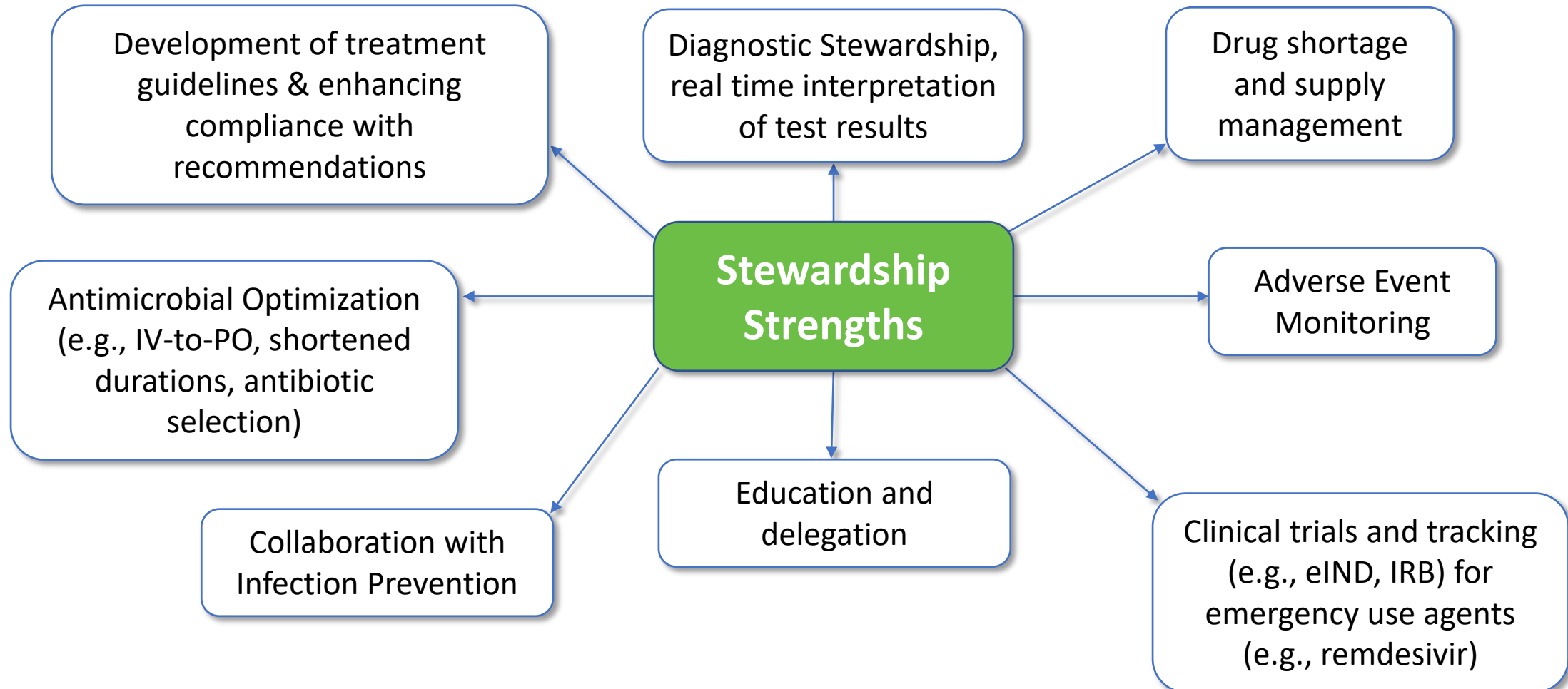
# Shift in Stewardship Resources

## Antibiotic Days of Therapy/1000 Days Present



# The Opportunities

# Leveraging Stewardship Experience in a Pandemic





# Peer Support Saves the Day

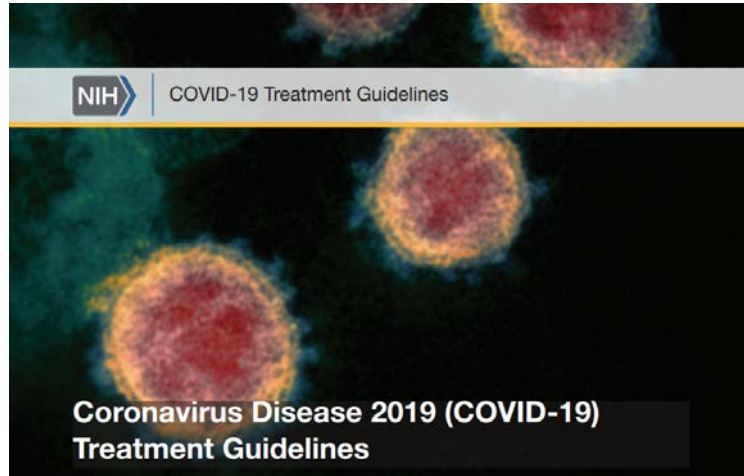


COVID-19 Resource Center —



NOVEL CORONAVIRUS 2019 (2019-NCOV) RESOURCES

# ASP Leaders in National Guidelines



## Infectious Diseases Society of America Guidelines on the Treatment and Management of Patients with COVID-19

Published by IDSA on 4/11/2020. Last updated, 11/18/2020

### Two Stewardship Colleagues Contributing to National COVID-19 Treatment Guidelines

#### NIH Guideline:

- Susan Davis, PharmD, Wayne State University

#### IDSA Guideline:

- Jason Gallagher, PharmD, Temple University

1. <https://www.covid19treatmentguidelines.nih.gov/>

2. <https://www.idsociety.org/globalassets/idsa/practice-guidelines/covid-19/treatment/idsa-covid-19-gl-tx-and-mgmt-v2.1.0.pdf>.

# A Cautionary Tale

PENICILLIN'S FINDER ASSAYS ITS FUTURE: Sir Alexander Fleming Says Improved Dosage  
New York Times (1945) - Current (6); Apr 26, 1945.  
ProQuest Historical Newspapers: The New York Times (1851-2007) with Index (1851-1991)  
pg. 21

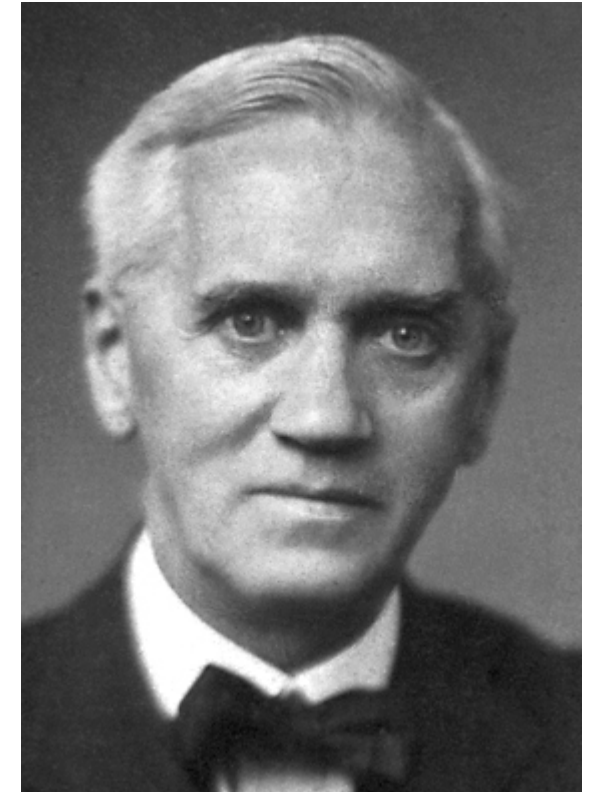
## PENICILLIN'S FINDER ASSAYS ITS FUTURE

**Sir Alexander Fleming Says  
Improved Dosage Method Is  
Needed to Extend Use**

Sir Alexander Fleming, discoverer of penicillin, said last night that a better method of administering the drug than by injection every two or three hours as at present was needed to extend its use. The British scientist warned, however, in speaking at a dinner in his honor in the Hotel Waldorf-Astoria, that administration by mouth would lead to "self-medication and all its abuses."

He gave full credit to the American Pharmaceutical Manufacturers Association for the "phenomenal increase in production" of penicillin to the point where it was

“The public will demand [the drug and]...then will begin an era... of abuses....In such a case the thoughtless person playing with penicillin treatment is morally responsible for the death of the man who finally succumbs to infection with penicillin-resistant organism”



# Acknowledgments

- University of Maryland Medical Center Antimicrobial Stewardship to Improve Clinical Outcomes Team
- Julie Ann Justo, PharmD, MS and other members of the Society of Infectious Diseases Pharmacists Board of Directors



# Resources

- MMWR Vol 63 March 2014.
- JAMA 2016;316:2115-2125.
- Clin Microbiol Infect 2020 (epub ahead of print); doi:10.1016/j.cmi.2020.07.016
- [https://media.tghn.org/medialibrary/2020/04/ISARIC Data Platform COVID-19 Report 8APR20.pdf](https://media.tghn.org/medialibrary/2020/04/ISARIC_Data_Platform_COVID-19_Report_8APR20.pdf)
- <https://www.covid19treatmentguidelines.nih.gov/>
- [https://www.who.int/publications/i/item/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-\(ncov\)-infection-is-suspected](https://www.who.int/publications/i/item/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-(ncov)-infection-is-suspected).
- Intensive Care Med. 2020;46(5):854-887.
- <https://www.idsociety.org/globalassets/idsa/practice-guidelines/covid-19/treatment/idsa-covid-19-gl-tx-and-mgmt-v2.1.0.pdf>.