pennsylvania
DEPARTMENT OF HEALTH

The Steward

A partnership in reducing antimicrobial resistance through antimicrobial stewardship

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In This Issue

News You Can Use

The Pennsylvania Department of Health has created a poster commitment project to promote the judicious use of antibiotics in outpatient settings across the Commonwealth. You can access the email invitation to participate from Dr. Rachel Levine, informative webinar, and the poster commitment project tool kit on TRAIN PA after 6/18/19. https://www.train.org/pa/

Accountability and Drug Expertise

Contributed by Christine L Mulgrew, MPH PhD & Jane Gould MD, FAAP

Who is leading your Antibiotic Stewardship program (ASP)? Are they trained and effective? Who takes direction from the leaders to develop and implement change? These are critical questions to address in the CDC's core elements of an antibiotic stewardship program (ASP). First and foremost, all healthcare facilities need a strong leader for the ASP who is held accountable for the outcomes of the ASP. For hospitals this means ideally both a physician leader and pharmacist leader. For nursing homes, the medical director and director of nursing would be ideal leadership partners. For small hospitals this might mean using part-time staff, off-site expertise and hospitalists. For critical access hospitals designating the Chief Medical Officer or someone who reports to the C-suite would be ideal. Effective leaders should be provided adequate authority and time to oversee and manage the program and are expected to report ASP outcomes to the hospital board and C-suite executives.

	Good	Better	Best
1 or 2 facility appropriate leaders	✓	✓	✓
Leaders adequately trained		✓	✓
Leaders held accountable for measured outcomes		✓	✓
A variety of staff engaged in carrying out their role in ASP		✓	✓
Improvement in measured outcomes is linked to performance review and/or incentive payments for key leaders			✓
Use NHSN's SAAR and *C. difficile* infection rates as part of performance measures			✓
Use of the bedside nurse in frontline programs and patient education efforts			✓

The next step in developing a successful program is providing training to those leaders. Training programs for physicians and pharmacists are offered by their professional associations. CDC provides extensive free online training for other leader types on TRAIN.org.

Do You Know About TRAIN PA?

TRAIN PA is a learning management system and it is the most comprehensive catalog of public health training opportunities for professionals. TRAIN is a free service for learners. TRAIN contains courses from CDC and health departments across the United States. You will find live and prerecorded trainings here as well as a searchable course catalog. There is also a built-in tracking system to track your learning on TRAIN PA. Many courses offered here also include continuing education credits.

To access TRAIN PA, just go to: https//www.train.org/pa/ You will then need to click on the "Create an Account" button found on the left side of the screen. Once you are logged in, use the search tool to locate training topics or if you have a course ID, you can enter that number.

The ASP leader will need to engage with a variety of staff such as nurses, physicians, non-physician prescribers, pharmacy staff, microbiology laboratory staff, information technology staff, quality improvement staff, infection preventionists and/or hospital epidemiologists, and department heads. Effective ASPs start with making small evidence-based changes to policies and processes and select metrics to monitor antibiotic use. The "best" ASPs have a multidisciplinary team that develops a strategic plan, develops policies, tracks outcome measures, educates other staff in antibiotic stewardship (AS) principles, develops AS competencies for all healthcare professionals, and celebrates successes. The "best" ASPs will also solicit input from the bedside nurses to improve implementation of new AS policies.

As ASP leaders, they are responsible for communicating the vision and importance of the ASP, overseeing the development of the ASP strategy, setting the priorities of the team, walking the new policies through the hospital's bureaucracy for approval, and presenting periodic progress reports the Board and C-suite executives.

Is your ASP "good", "better than good" or the "best"? What are the next steps your facility can take to become better?

You can find articles that describe how to overcome barriers to establishing accountability and drug expertise in the References Section of this newsletter.

Antimicrobial Resistance Threats

2019 Quarter 1 Data

Pennsylvania Department of Health

CP-CRE is not yet reportable throughout PA. The cases identified below were captured through voluntary reporting by healthcare facilities and laboratories, including the PA Bureau of Laboratories.

Carbapenemase mechanism	Count (1/1/2019 – 3/31/2019)
KPC	10
NDM	3
IMP	0
OXA-48	0
VIM	0
mCIM positive with no genotype detected	1
Resistance mechanism	**Count (1/1/2019 – 3/31/2019)**
mcr-1 gene	0
mcr-2 gene	0
Any novel resistance gene	0

Do You Have a Success Story Related to Your Work in AS/AR?

We would love to feature your facility or lab as a success story in a future edition of The Steward! Please send a brief summary related to preventing antimicrobial resistance or promoting stewardship activities to our resource mailbox at RA-DHHAI@pa.gov.

Contact Us

Contact Us

Bureau of Epidemiology

Healthcare-Associated Infection Prevention & Antimicrobial Stewardship

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2019 Quarter 1 Data
Philadelphia Department of Public Health
Division of Disease Control Healthcare-associated Infections/Antimicrobial Resistance Program

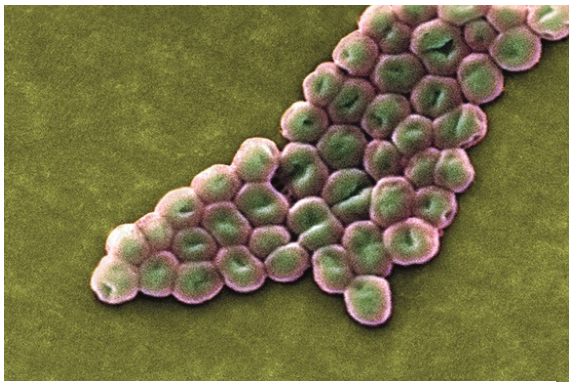
Carbapenemase mechanism	Count (1/1/2019 – 3/31/2019)
KPC	27
NDM	4
IMP	0
OXA-48	0
VIM	0
mCIM positive with no genotype detected*	2
Resistance mechanism	**Count (1/1/2019 – 3/31/2019)**
mcr-1 gene	0
mcr-2 gene	0
Any novel resistance gene	0

Footnotes: *Philadelphia's number for *mCIM positive with no genotype detected* includes CRE isolates that were tested for carbapenemase production in clinical laboratories but were not submitted for mechanism testing by PDPH due to limitations in testing capacity and/or availability of isolate. These isolates may have tested positive for carbapenemase production via methods other than mCIM (i.e. MHT, Carba-NP).

Expanded Antimicrobial Susceptibility Testing for Hard-to-treat Infections

By Cara Bicking Kinsey PhD, MPH, RNC-NIC, CIC

CDC has launched a new program to offer clinicians advanced antimicrobial susceptibility testing that is unavailable anywhere else. Testing will be completed by CDC's Antibiotic Resistance Lab Network (ARLN) to assist with finding new, effective treatment options for patients with hard-to-treat infections. Clinicians may encounter patients infected with Enterobacteriaceae that are resistant to all drugs for which susceptibility testing is available. Resistance to new therapies including ceftazidime-avibactam and meropenem-vaborbactam has recently been identified. Fortunately, organisms causing these hard-to-treat infections may be susceptible to the combination therapy ceftazidime-avibactam-aztreonam; however, clinical



Ceftazidime-avibactam
Image from: https://www.pharmaceutical-journal.com/research/ceftazidime-avibactam-a-novel-cephalosporin/-lactamase-inhibitor/20202413.article

laboratories cannot test for susceptibility to this combination. The expanded susceptibility testing program helps to address this gap. The program is currently offering expanded antimicrobial sensitivity testing for ceftazidime, avibactam, and aztreonam and combinations of these drugs, at no cost. Turn-around time is fast (3 days from receipt of the isolate at the lab) to assist with treatment decisions.

Hospitals and clinicians are encouraged to submit Enterobacteriaceae isolates by contacting the PA Department of Health HAIP/AS program (RA-DHHAI@pa.gov) and the Regional ARLN laboratory in Maryland (MDPHL.ARLN@maryland.gov).

Meropenem-vaborbactam Image from: https://pulmccm.org/critical-care-review/meropenem-vaborbactam-vabomere-new-broad-spectrum-antibiotic-sepsis/

Eligible isolates may include Enterobacteriaceae that:

- Test non-susceptible to all beta-lactams (i.e. penicillin derivatives, cephalosporins, monobactams, and carbapenems), including either ceftazidime-avibactam or meropenem-vaborbactam. These isolates may be MBL-producing isolates with few effective treatment options.

-OR-

- Produce NDM, VIM, or IMP genes confirmed by a molecular test and are highly resistant to all or most antimicrobials already tested.

Eligibility for testing will be determined by the Regional ARLN laboratory in conjunction with the PA HAIP/AS program. See our HAIP/AS Website for more information at https://www.health.pa.gov/topics/Documents/Programs/HAIP-AS/Expanded%20AST%20Fact%20Sheet.pdf

Candida Speciation: Working with Public Health to Properly Identify *Candida auris*

Contributed by: Jane M. Gould, MD, FAAP & Julie Paoline, MA, CPHA, CIC

Candida auris is an emerging fungus that presents a serious global health threat. Although it was just discovered in 2009, it has spread quickly and caused infections in more than a dozen countries. The Centers for Disease Control and Prevention (CDC) reports, as of March 31, 2019, that these difficult to treat infections have been detected in several states near Pennsylvania including New Jersey (n=106), New York (n=319), Maryland (n=3), Indiana (n=1), and Illinois (n=156). There are no reports of *C. auris* infection acquired in Pennsylvania yet, however healthcare providers and laboratorians

are strongly encouraged to remain hypervigilant in rapidly detecting cases when they are suspected.

The Department is concerned about *C. auris* for three main reasons:

1. It is often **multidrug-resistant**, meaning that it is resistant to multiple antifungal drugs commonly used to treat *Candida* infections.
2. It is **difficult to identify** with standard laboratory methods, and it can be misidentified in labs without specific technology. Misidentification may lead to inappropriate management.
3. It has caused **outbreaks in healthcare settings**. For this reason, it is important to quickly identify *C. auris* in a hospitalized patient so that healthcare facilities can take special precautions to stop transmission.

Identification

C. auris can be misidentified as several different organisms when using traditional phenotypic methods for yeast identification. The table below summarizes common misidentifications based on the identification method used. If any of the species listed below are identified, or if species identity cannot be determined, further laboratory characterization using appropriate methodology should be sought.

Identification Method	Organism C. auris can be misidentified as
Vitek 2 YST	*Candida haemulonii* *Candida duobushaemulonii*
API 20C	*Rhodotorula glutinis* (characteristic red color not present) *Candida sake*
BD Phoenix yeast identification system	*Candida haemulonii* *Candida catenulata*
MicroScan	*Candida famata* *Candida guilliermondii* *Candida lusitaniae* *Candida parapsilosis*
RapID Yeast Plus	*Candida parapsilosis*

CDC's guidance provides detailed instruction for laboratories on when to suspect *C. auris*:

https://www.cdc.gov/fungal/diseases/candidiasis/recommendations.html

Reporting

Any laboratorian who **suspects or identifies *C. auris* in a patient should notify their local health department or the Bureau of**

Epidemiology at 1-877-PA-HEALTH to arrange confirmatory identification of the organism through public health laboratories.

Prevention of illness and control of the transmission of *C. auris* is dependent upon the coordination of efforts between the patient, facility, provider, and public health authority. The Department asks providers and laboratorians **to report all suspect or confirmed cases of *C. auris* immediately** so that broad public health response can be initiated in a timely manner. **Please contact the local health department or the Bureau of Epidemiology at 1-877-PA-HEALTH to report suspected infections or with any questions.**

A Near Miss

The Department was notified by the New York State Department of Health about a patient who was a roommate of an individual colonized with *C. auris*. The roommate was discharged to an acute rehab facility in southeastern Pennsylvania. The Department worked with the local health department, where the rehab facility was located, to ensure that the facility was notified immediately and that the patient and his now current roommate were placed on contact precautions. Colonization screening was coordinated within one business day through a public health laboratory that is part of the Antibiotic Resistance Laboratory Network (ARLN). Results came back negative for both patients and *C. auris* colonization was ruled out in these Pennsylvania patients.

Multi-drug Resistant *Salmonella enterica* serovar Infantis

Contributed by: Jane M. Gould, MD, FAAP & Julie Paoline, MA, CPHA, CIC

Salmonella enterica serovar Infantis (S. Infantis) is a serovar found in multiple animal hosts and animal food products. Many countries have reported increased incidence of S. Infantis infections, and the World Health Organization (WHO) states that *S.* Infantis is among the top 15 Salmonella serovars reported from all regions (1). The incidence (new cases) of *S.* Infantis infections in the U.S reported through the Foodborne Disease Active Surveillance Network was significantly higher in 2014 compared to 2006-2008 period (2). The reservoir for S. Infantis is thought to be food animals, particularly poultry. The U.S Department of Agriculture's Food Safety Inspection Service Food Safety Inspection Service (USDA-FSIS) commonly isolates S. Infantis from chicken, cattle and pigs. The USDA reported a greater than 50% increase in the percent of broiler chickens (chickens bred for meat production) that yielded *S.* Infantis from 2006-2017. Antimicrobial treatment is not generally recommended for *Salmonella* infections; however, it is recommended for certain vulnerable hosts and for invasive infections.

From 2014-2018, there were 7 reported national outbreaks that included Pennsylvania cases of *Salmonella* Infantis. Five outbreaks were linked to live poultry contact and two were the result of foodborne transmission. In the U.S., a recent multistate outbreak of multi-drug resistant *S.* Infantis linked to raw chicken products illustrates how rapidly these organisms can spread thru the food chain (3). One hundred and twenty-nine cases were reported from 32 states; 13 cases were from Pennsylvania, the third most numerous contributors of cases behind New York with 18 cases and Massachusetts with 17 cases. Twenty-five people required hospitalization and one death was reported from NY. Patients reported eating different types and brands of chicken products purchased from many different locations. The outbreak strain was identified in samples taken from raw chicken pet food, raw chicken products as well as live chickens. Antibiotic susceptibility testing of isolates from patients, food and environmental samples demonstrated that the outbreak strain was resistant to multiple antibiotics including: ampicillin, ceftriaxone, chloramphenicol, ciprofloxacin, fosfomycin, gentamicin, hygromycin, kanamycin, nalidixic acid, streptomycin, sulfamethoxazole, tetracycline and trimethoprim-sulfamethoxazole. Whole genome sequencing was performed on the animal and human isolates which determined they were closely related genetically.

Chickens
Image from:
https://morningchores.com/meat-chickens/

The number of yearly cases of *Salmonella* Infantis has increased over time, ranging from 37-72 cases per year in Pennsylvania, excluding Philadelphia. The symptoms can be serious, as 32% of cases with available information were reported to have required hospitalization. There have been no reported deaths in Pennsylvania from 2014-2018. These outbreaks illustrate the importance of obtaining clinical specimens for culture. The increasing reliance on the use of rapid, culture-independent diagnostic tests (CIDT) in clinical microbiology laboratories without the use of back-up culturing will have a negative impact on the necessary public health response for outbreak detection since the organism would not be available for subtyping and susceptibility testing. Laboratories should consider performing reflex culturing or saving specimens for public health laboratory culturing.

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