

Antimicrobial Stewardship Monthly Report

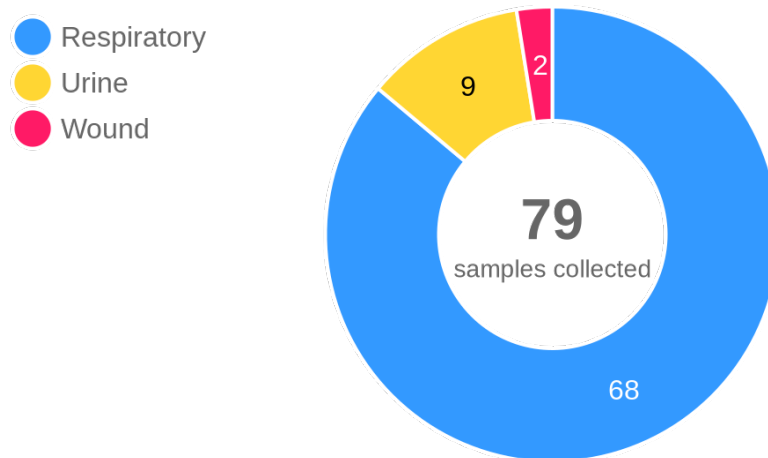
Sample Healthcare Facility

January 2021

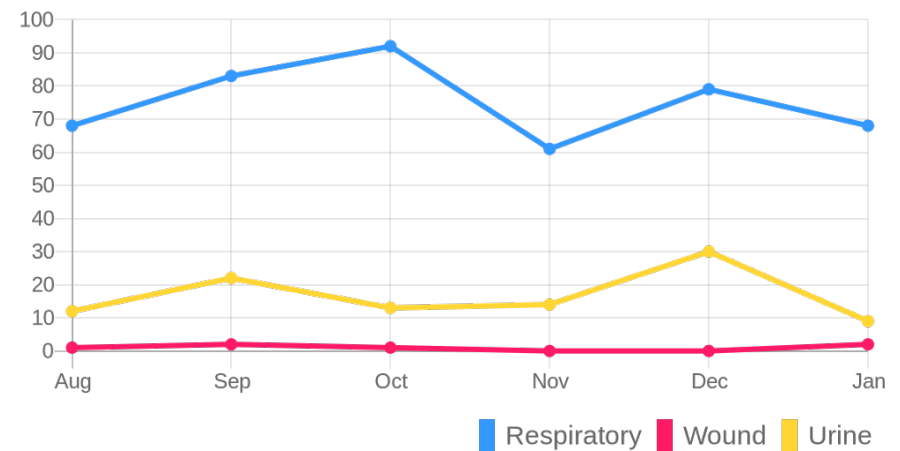


Overview: Specimens Collected at this Facility

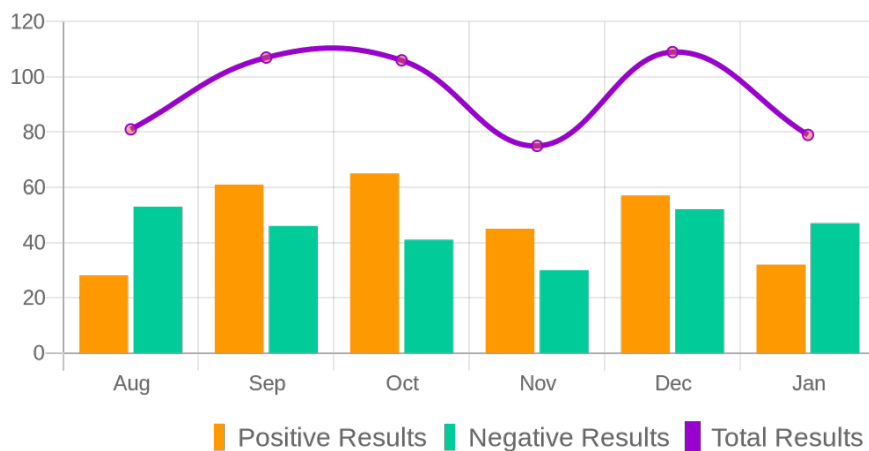
Samples Collected This Month



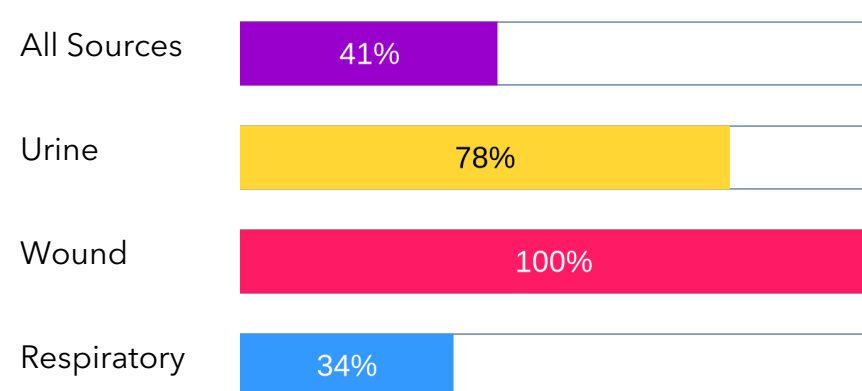
Monthly Testing Trends



Total Samples Collected: ▼ 28% compared to last month



Percentage of Positive Results



Antimicrobial Stewardship Program Checklist

The Arkstone ASP provides the CMS & CDC recommended core elements for a successful antimicrobial stewardship

☒ **Action: Policies and Programs currently implemented**

- Arkstone ASP: monthly reporting and analytics
- OneChoice Reports: treatment recommendations with lab reports
- Treatment Algorithms
- Quality improvement measures
 - Infection control recommendations
 - Infection control alerts
 - COVID-19 alerts
- Communication and feedback provided with
 - Monthly ASP Report
 - OneChoice Report

☒ **Drug Expertise: Improving antibiotic prescription habits**

- OnceChoice Report provides prescription guidance
 - Targeted therapy accounting for viral pathogens, resistance genes, dosing and duration
 - Clarity on possible specimen contaminants/colonizers

☒ **Tracking and Reporting of Infection Trends**

- Provided monthly through the Arkstone ASP report
- Specific monitoring given on specific organisms
 - COVID
 - C-diff
 - MRSA
 - Influenza
 - Multi-Drug Resistance Organisms

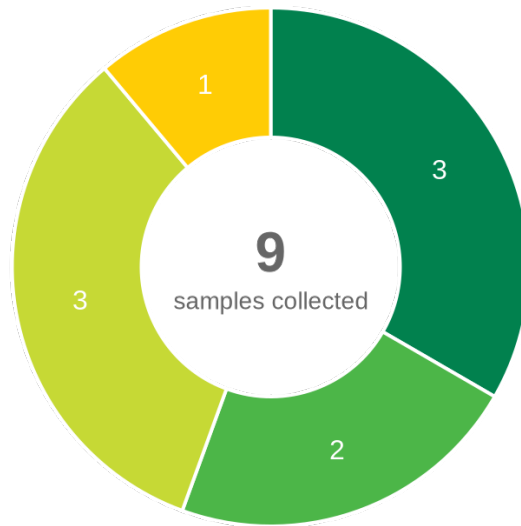
☒ **Education: New information for healthcare providers**

- Monthly ASP News Digest
- Education with each OnceChoice report
- Education With each Arkstone ASP report

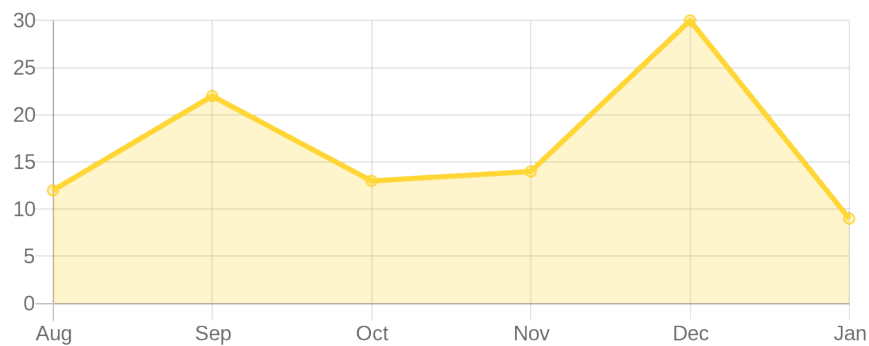
Urine Samples

Pathogens Detected in a Single Urine Sample

- 0 Pathogens
- 1 Pathogen
- 2 Pathogens
- 4 Pathogens



Urine Samples Collected Each Month



Most Detected Pathogens

| | Dec | Jan |
|--|--------|--------|
| Pseudomonas aeruginosa | 73.33% | 44.44% |
| Escherichia coli | 36.67% | 33.33% |
| Proteus mirabilis, vulgaris | 3.33% | 22.22% |
| Gardnerella vaginalis | 6.67% | 22.22% |
| Stenotrophomonas maltophilia | 50.00% | 22.22% |
| Candida albicans, glabrata, parapsilosis, tropicalis | 6.67% | 11.11% |
| Enterococcus faecium, faecalis | 26.67% | 11.11% |

Antimicrobial Resistance Detected

| | Dec | Jan |
|------------------------|--------|--------|
| Tetracycline | 23.33% | 22.22% |
| Methicillin | — | 11.11% |
| Macrolide, Clindamycin | 33.33% | 11.11% |

Urinary Tract Infection ASP Checklist

☒ Action

- Arkstone ASP: monthly reporting and analytics
- OneChoice Reports: treatment recommendations
- Treatment Algorithms: McGeers Criteria
- Quality improvement measures, consider
 - MDRO detected in urine specimens may require contact precautions to prevent the spread of these microbes
 - Avoid indiscriminate or routine urine “screening”
 - Remove foley catheters if possible

☒ Drug Expertise

- Appropriate Antibiotic: Avoid fluoroquinolones as first line
- Appropriate Dosing: Lower dosing can still be effective
- Appropriate Duration: 3-7 days is usually adequate
- Appropriate Treatment: Asymptomatic bacteriuria does not typically need treatment

☒ Tracking and Reporting

- Provided monthly through the Arkstone ASP report
- All microbes detected in urine specimens
- Every resistance gene detected in urine specimens

☒ Other Policies

Consider antibiotic timeouts on day 2-3 to assure a change in plan was not implemented and in an effort to de-escalate antibiotics

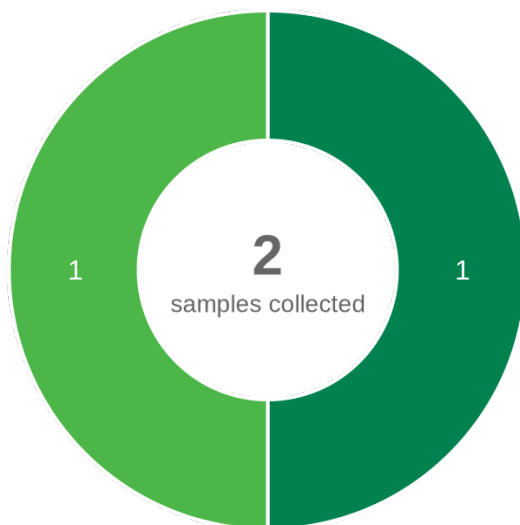
☒ Common Pitfalls

Test of cure, or retesting a resident's urine for bacteria is not recommended, since most residents in the nursing home will colonize bacteria. Therefore, a positive urine specimen does not necessarily imply infection or rule out the absence of other possible sources of the resident's symptoms.

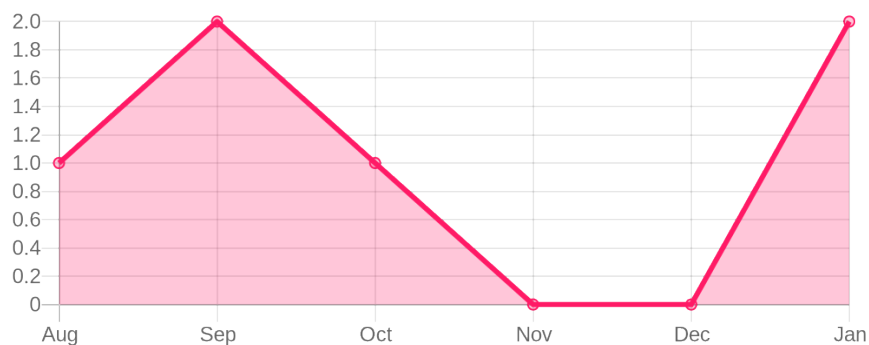
Wound Samples

Pathogens Detected in a Single Wound Sample

- 1 Pathogen
- 2 Pathogens



Wound Samples Collected Each Month



Most Detected Pathogens

| | Dec | Jan |
|--|-----|---------|
| Staphylococcus coag - epidermidis, haemolyticus, saprophyticus | — | 100.00% |
| Pseudomonas aeruginosa | — | 50.00% |
| Stenotrophomonas maltophilia | — | 50.00% |
| Peptostreptococcus anaerobius, magnus, prevotii | — | 50.00% |

Antimicrobial Resistance Detected

| | Dec | Jan |
|-------------|-----|--------|
| Methicillin | — | 50.00% |

Wound ASP Checklist

☒ Action

- Arkstone ASP: monthly reporting and analytics
- OneChoice Reports: treatment recommendations
- Quality improvement measures, consider
 - Contact precautions for MDRO
 - Avoid indiscriminate wound microbiology workup
 - Avoid treating open uninfected wounds with antibiotics
 - Offsetting of pressure and frequent turning
 - Closely monitor residents with increased risks of falls, and subsequently developed wounds

☒ Drug Expertise

- Appropriate Antibiotic: Avoid fluoroquinolones as first line treatment
- Appropriate Duration: 5 days is often adequate
- Appropriate Treatment: Wounds have the potential to colonize bacteria, even if uninfected

☒ Tracking and Reporting

- Provided monthly through the Arkstone ASP report
- Specific monitoring given on specific organisms
 - MRSA

☒ Other Policies

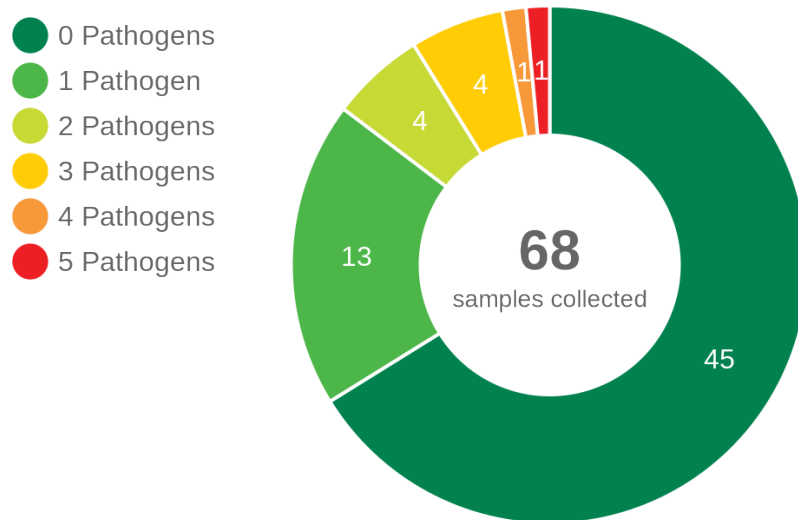
Consider antibiotic timeouts on day 2-3 to assure a change in plan was not implemented and in an effort to deescalate antibiotics

☒ Common Pitfalls

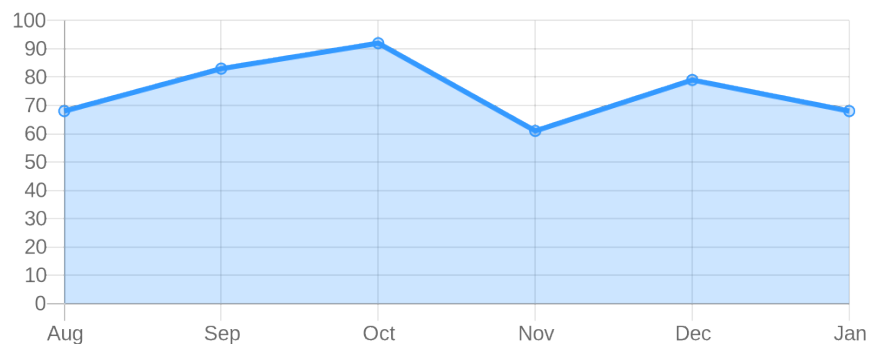
Most wounds are not worked up appropriately. Often, specimens obtained for microbiology have many contaminants. Targeted therapy therefore becomes difficult.

Respiratory Samples

Pathogens Detected in a Single Respiratory Sample



Respiratory Samples Collected Each Month



Most Detected Pathogens

| | Dec | Jan |
|--------------------------|--------|--------|
| Human rhinovirus | 2.53% | 16.18% |
| COVID-19 | 3.80% | 10.29% |
| Epstein Barr (HHV-4) | 10.13% | 8.82% |
| Staphylococcus aureus | 24.05% | 8.82% |
| Haemophilus influenzae | 2.53% | 8.82% |
| Streptococcus pneumoniae | 7.59% | 5.88% |
| Human Herpesvirus 6 | — | 2.94% |

Antimicrobial Resistance Detected

| | Dec | Jan |
|---------------|-----|-----|
| None Detected | | |

Respiratory Tract Infection ASP Checklist

☒ Action

- Arkstone ASP: monthly reporting and analytics
- OneChoice Reports: treatment recommendations
- Treatment Algorithms
- Quality improvement measures, consider
 - MDRO may require contact precautions to prevent the spread of these microbes
 - Avoid indiscriminate sputum microbiology workup
 - Consider expanded microbiology workup to rule out viral infections
 - Improve oral-dental hygiene if possible

☒ Drug Expertise

- Appropriate Antibiotic: Avoid fluoroquinolones as first line treatment
- Appropriate Duration: 5-7 days is usually adequate pneumonia or sinusitis
- Appropriate Treatment: The oro-nasopharyngeal region can potentially colonize bacteria even if infection is not present

☒ Tracking and Reporting

- Provided monthly through the Arkstone ASP report
- Specific monitoring given on specific organisms
 - COVID-19
 - Influenza
 - Bordetella
 - Legionella

☒ Other Policies

- Consider antibiotic timeouts on day 2-3 to assure a change in plan was not implemented and in an effort to deescalate antibiotics
- COVID-19, DTAP, influenza and pneumococcal vaccines when applicable

☒ Common Pitfalls

Most common causes of upper respiratory infections are viral and self-limiting. Broad spectrum antibiotics in the presence of respiratory symptoms is the most common cause for the overutilization of antibiotics.

GI Samples

0 samples were collected this month

Monitoring GI infections is key to promoting improved resident outcomes and reduced possible outbreaks

Norovirus - Most Common Cause

- Highly contagious and can be transmitted person to person or via food and water
- LTCFs are the most common setting for outbreaks
- Symptomatic residents can shed virus for at least 21 days
- Cause of over 50% of acute gastroenteritis in LTCFs
- All-cause mortality in LTCFs increases during outbreaks

C-diff

- Associated with antibiotic use
- Highly contagious
- Difficult to treat due to growing antibiotic resistance
- Contact precautions required for duration of symptoms

Other Causes

Salmonella, Staphylococcus, E. coli O157:H7, Toxigenic E. coli, Campylobacter, Shigella, Yersinia, Giardia, Cryptosporidium

Measures to Avoid Outbreaks

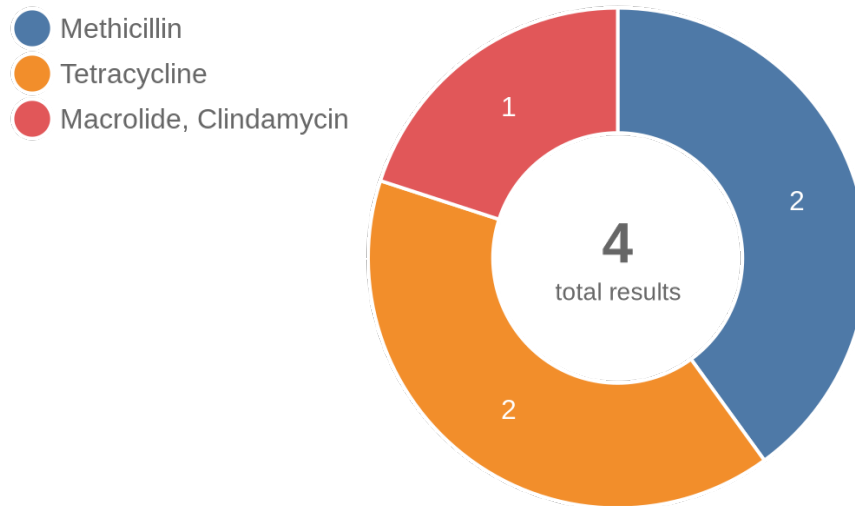
- Avoid the unnecessary use of antibiotics
- Rule out common causes of GI illness
- Monitor symptoms amongst residents
- Consider expanded GI microbiology workup

Common Pitfalls

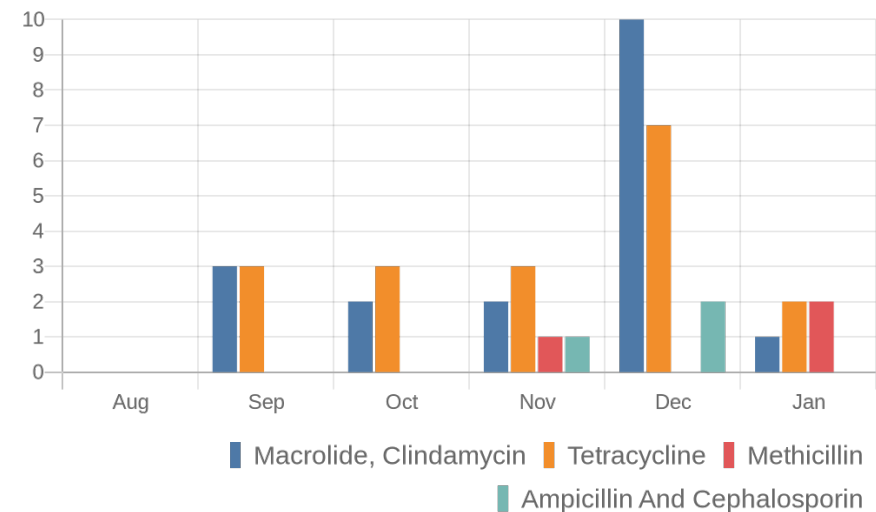
Overutilization of antibiotics may lead to C-diff, which can be a significant cause of morbidity for residents in long term care facilities.

Antimicrobial Resistance

Resistance Detected This Month



Monthly Trend



Precautions: When more than one class of antibiotic is inhibited, standard and contact precautions.

Definition: Standard protocols with gowns and gloves.

Hand Washing: Soap and running water or hand sanitizer.

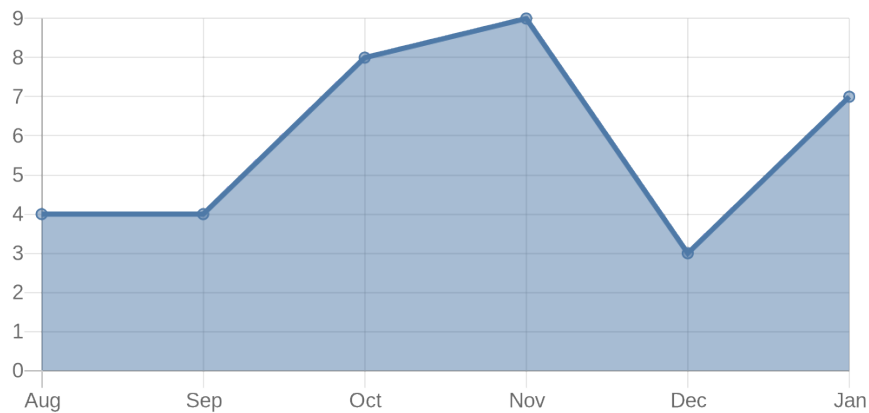
Special Considerations: Certain multi-drug resistant organisms may colonize in residents and require decolonization treatments.

Duration of Precaution: Case by case decision.

COVID-19

Novel coronavirus was detected 7 times this month, which is 8.86% of total samples tested.

Monthly Trend



Special Considerations

Move the infected to COVID units if possible.

Infection Control Measures

COVID-19 requires standard, contact, airborne/droplet and eye protection.

Definition

Gowns, gloves, N95 or higher level respirator and eye protection.

Infection Control Measures

Soap and running water or hand sanitizer.

Duration of Precaution

10 days after positive PCR result.

Antibiotics with Possible Activity

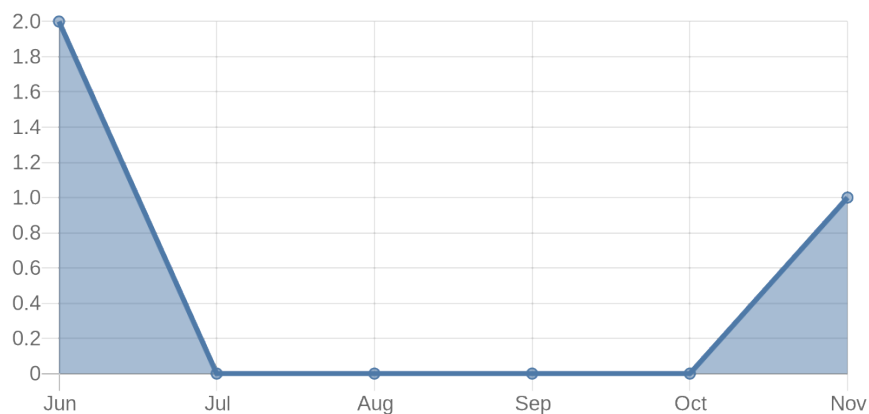
- Remdesivir **ARKSCORE** 4

MRSA

Methicillin-Resistant *Staphylococcus aureus* was detected 1 time this month, which is 1.33% of total samples tested.

MRSA is responsible for several difficult-to-treat infections and is common in hospitals and nursing homes, where people with open wounds, invasive devices such as catheters, and weakened immune systems are at greater risk of infection.

Monthly Trend



Special Considerations

MRSA may colonize, so decolonization may be necessary.

Infection Control Measures

MRSA requires contact precautions.

Definition

Gowns and gloves when entering the room.

Infection Control Measures

Soap and running water or hand sanitizer.

Duration of Precaution

Case by case decision.

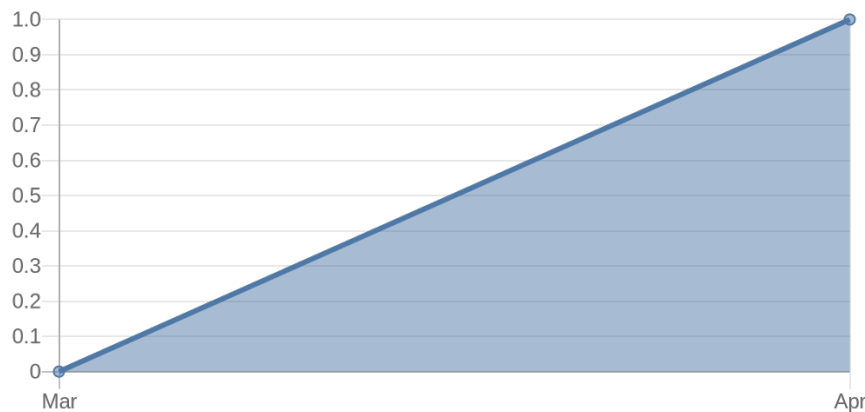
Antibiotics with Possible Activity

- Clindamycin **ARKSCORE 3**
- Delafloxacin **ARKSCORE 5**
- Doxycycline **ARKSCORE 1**
- Linezolid **ARKSCORE 4**
- Trimethoprim-Sulfamethoxazole **ARKSCORE 1**

C-diff

Clostridioides difficile was detected 1 time this month, which is 20.00% of total samples tested.

Monthly Trend



Special Considerations

Hand sanitizers are ineffective in removing C-diff spores from the hands.

Infection Control Measures

C-diff requires contact precautions.

Definition

Gowns and gloves when entering the room.

Infection Control Measures

Soap and running water.

Duration of Precaution

Until resolution of symptoms.

Antibiotics with Possible Activity

- Fidaxomicin **ARKSCORE 1**
- Metronidazole **ARKSCORE 2**
- Vancomycin **ARKSCORE 3**

The Good News

- **No cases of MRSA were detected during this period.**

MRSA is responsible for several difficult-to-treat infections and is common in hospitals and nursing homes, where people with open wounds, invasive devices such as catheters, and weakened immune systems are at greater risk of infection.

MRSA requires contact precautions.

- **No cases of C-diff were detected during this period.**

C-diff requires contact precautions.

- **No cases of Influenza were detected during this period.**

Influenza requires standard and droplet precautions.

- **No cases of Legionella were detected during this period.**

Legionnaires' disease spreads through mist, such as from air-conditioning units for large buildings. Adults over the age of 50 and people with weak immune systems, chronic lung disease, or heavy tobacco use are most at risk.

Legionella requires standard precautions.

- **No cases of Norovirus were detected during this period.**

Noroviruses are a group of highly contagious viruses that cause gastroenteritis, vomiting and diarrhea.

Norovirus requires standard and contact precautions.

- **No cases of Bordetella were detected during this period.**

Whooping cough, or pertussis, is the most common human infection caused by the genus Bordetella. It is an acute respiratory infection, affecting primarily non- or under-immunized individuals, especially infants and children.

Bordetella requires standard and droplet precautions.

Lab Result Summary

Respiratory Samples

| | | |
|------------------------------|--|--|
| 216401-339224 Jan 2, 2021 | Epstein Barr (HHV-4) | ONECHOICE® Treatment may not be indicated |
| 215106-347156 Jan 2, 2021 | Streptococcus pneumoniae Human rhinovirus | ONECHOICE® Treatment may not be indicated |
| 216400-339223 Jan 2, 2021 | Staphylococcus aureus Human rhinovirus | ONECHOICE® Treatment may not be indicated |
| 216403-333894 Jan 2, 2021 | Staphylococcus aureus | ONECHOICE® Treatment may not be indicated |
| 217121-339230 Jan 4, 2021 | Staphylococcus aureus | ONECHOICE® Treatment may not be indicated |
| 221522-340872 Jan 6, 2021 | Human rhinovirus | ONECHOICE® Treatment may not be indicated |
| 225488-348644 Jan 8, 2021 | COVID-19 | ONECHOICE® Remdesivir 200 mg IV loading dose, then 100 mg IV daily x 5-10 days for hospitalized patients (+/-baricitinib) |
| 225449-347300 Jan 9, 2021 | Haemophilus influenzae Streptococcus pneumoniae Epstein Barr (HHV-4) | ONECHOICE® Azithromycin 500 mg x 1 day, then 250 mg x 4 days for possible acute sinusitis |

Respiratory Samples

| | | | |
|-------------------------------|--------------------------|--|--|
| 231359-352692 Jan 12, 2021 | Staphylococcus aureus | ONECHOICE® Treatment may not be indicated | |
| 234167-360276 Jan 13, 2021 | Staphylococcus aureus | Haemophilus influenzae | Epstein Barr (HHV-4) ONECHOICE® Doxycycline 100 mg PO BID x 5 days for possible acute sinusitis |
| 231362-352694 Jan 13, 2021 | Streptococcus pneumoniae | COVID-19 | ONECHOICE® Remdesivir 200 mg IV loading dose, then 100 mg IV daily x 5-10 days for hospitalized patients (+/-baricitinib) |
| 231361-352693 Jan 13, 2021 | Haemophilus influenzae | ONECHOICE® Azithromycin 500 mg x 1 day, then 250 mg x 4 days for possible acute sinusitis | |
| 231363-352695 Jan 13, 2021 | Haemophilus influenzae | Streptococcus pneumoniae | Human rhinovirus ONECHOICE® Treatment may not be indicated |
| 234170-360278 Jan 15, 2021 | Human Herpesvirus 6 | ONECHOICE® Treatment may not be indicated | |
| 234169-360277 Jan 15, 2021 | Epstein Barr (HHV-4) | ONECHOICE® Treatment may not be indicated | |
| 234147-360271 Jan 16, 2021 | Staphylococcus aureus | Epstein Barr (HHV-4) | ONECHOICE® Treatment may not be indicated |
| 234162-360274 Jan 16, 2021 | Haemophilus influenzae | ONECHOICE® Azithromycin 500 mg x 1 day, then 250 mg x 4 days for possible acute sinusitis | |

Respiratory Samples

| | | |
|-------------------------------|---|--|
| 234176-360279 Jan 16, 2021 | Haemophilus influenzae Epstein Barr (HHV-4) Human Herpesvirus 6 Human rhinovirus COVID-19 | ONECHOICE® Remdesivir 200 mg IV loading dose, then 100 mg IV daily x 5-10 days for hospitalized patients (+/-baricitinib) |
| 234145-360270 Jan 18, 2021 | Human rhinovirus | ONECHOICE® Treatment may not be indicated |
| 237062-365053 Jan 18, 2021 | COVID-19 | ONECHOICE® Remdesivir 200 mg IV loading dose, then 100 mg IV daily x 5-10 days for hospitalized patients (+/-baricitinib) |
| 245989-372640 Jan 26, 2021 | COVID-19 | ONECHOICE® Remdesivir 200 mg IV loading dose, then 100 mg IV daily x 5-10 days for hospitalized patients (+/-baricitinib) |
| 250114-377990 Jan 30, 2021 | COVID-19 | ONECHOICE® Remdesivir 200 mg IV loading dose, then 100 mg IV daily x 5-10 days for hospitalized patients (+/-baricitinib) |
| 250115-377991 Jan 30, 2021 | COVID-19 | ONECHOICE® Remdesivir 200 mg IV loading dose, then 100 mg IV daily x 5-10 days for hospitalized patients (+/-baricitinib) |

Urine Samples

| | | |
|------------------------------|-----------------------------|---|
| 217583-339241 Jan 4, 2021 | Proteus mirabilis, vulgaris | ONECHOICE® Trimethoprim-Sulfamethoxazole DS 1 tab PO BID x 7 days for possible acute UTI |
|------------------------------|-----------------------------|---|

Urine Samples

217584-339242

Jan 4, 2021

Pseudomonas aeruginosa

Escherichia coli

Methicillin Resistance

Tetracycline Resistance

ONECHOICE® Levofloxacin 250-750 mg PO daily x 3 days for possible acute UTI

234445-360284

Jan 13, 2021

Pseudomonas aeruginosa

Escherichia coli

ONECHOICE® Levofloxacin 250-750 mg PO daily x 3 days for possible acute UTI

234446-360285

Jan 18, 2021

No pathogens detected

Tetracycline Resistance

ONECHOICE® Treatment may not be indicated

245812-374932

Jan 27, 2021

Pseudomonas aeruginosa

Stenotrophomonas maltophilia

Proteus mirabilis, vulgaris

Enterococcus faecium, faecalis

Macrolide, Clindamycin Resistance

ONECHOICE® Levofloxacin 750 mg q 24 hours x 3 days for possible acute UTI (see below regarding activity)

245813-374940

Jan 27, 2021

Pseudomonas aeruginosa

ONECHOICE® Levofloxacin 250-750 mg PO daily x 7 days for possible acute UTI

Urine Samples

249926-382159

Jan 30, 2021

Escherichia coli

Stenotrophomonas maltophilia

ONECHOICE® Trimethoprim-Sulfamethoxazole 15 mg/kg/day (TMP component) PO divided TID x 3 days for possible acuteUTI

Wound Samples

217567-339240

Jan 4, 2021

Pseudomonas aeruginosa

Stenotrophomonas maltophilia

ONECHOICE® Levofloxacin 750 mg PO daily x 5 days for possible skin
and soft tissue infection

249934-382154

Jan 30, 2021

Peptostreptococcus anaerobius, magnus, prevotii

Methicillin Resistance

ONECHOICE® Amoxicillin Clavulanate 875/125 mg PO BID x 5 days for
possible skin and soft tissue infection

News & Education

Did You Know?

The U.S. Food and Drug Administration (FDA) has issued several warnings regarding fluoroquinolone (FQ) use. FQs include Levaquin (levofloxacin), Cipro (ciprofloxacin), Avelox (moxifloxacin) and Baxdela (delafloxacin). There are serious side effects associated with this class of antibiotics. When used systemically (IV or PO), disabling and potentially permanent adverse drug reactions can occur. Side effects include but are not limited to, joint, tendon, muscle, and nerve damage. CNS toxicity has been reported and varies from mild, such as lightheadedness, to moderate such as confusion, to severe, such as seizures or even psychosis. Pseudotumor cerebri is a potential side effect. Aortic dissection and rupture is associated with use in patients who have predisposing conditions. Hypoglycemia and hyperglycemia in both diabetic and non diabetic patients is also a possible side effect. False positive opiate screen may occur with FQs. QTc prolongation may occur. GI distress is possible as well as risk for C. difficile colitis. Thrombocytopenia has also been reported. Lastly, FQs may exacerbate myasthenia gravis.

What can you do?

FDA guidelines state that FQs should no longer be used as first line treatment for the following infections:

- Acute sinusitis
- Acute bronchitis
- Uncomplicated urinary tract infections

In the above clinical scenarios, FQs should only be used as alternative therapy. Due to high risk of adverse reaction, consider avoiding FQs if possible, and reserving this antibiotic only when truly necessary.

Other infections to consider alternative antibiotics prior to use of FQs:

- Community acquired pneumonia
- Mild diverticulitis

“Progress is impossible without change, and those who cannot change their minds cannot change anything.”

- George Bernard Shaw