



CULTIVATING A STEWARDSHIP CULTURE WITH ANALYTICS AND PCT-GUIDED THERAPY



PIONEERING DIAGNOSTICS



SUMMARY

The Antimicrobial Stewardship Team at St. Bernard's Five Rivers Medical Center, led by Dr. Mike Broyles, reduced *C. difficile* infection rates by 64%, mortality rates by 62%, and days of therapy by 47% through the use of PCT.¹ He and his team have been able to continue to monitor these gains and improve overall stewardship reporting by acquiring bioMérieux's CLARION software-as-a-service solution. Furthermore, stewardship reports that used to take months to compile are now created and distributed in just a few clicks.

BACKGROUND

The CDC estimates about 30% of all antibiotics prescribed in U.S. acute care hospitals are either unnecessary or suboptimal.² Like many medications, antibiotics can have serious adverse effects.

In 2014, the U.S. government called upon all hospitals to implement antibiotic stewardship programs to fight antimicrobial resistance and preserve the efficacy of existing antimicrobials for as long as possible. Then, on April 1, 2020, the Centers for Medicare and Medicaid Services (CMS) made demonstrating the functioning of an effective antimicrobial stewardship program (ASP) a condition of participation. As hospitals implemented formal antimicrobial stewardship programs, they soon realized they needed innovative tools to track progress and measure success.





CHALLENGE

When Dr. Mike Broyles began his career at St. Bernard's Five Rivers Medical Center more than 28 years ago, he launched the hospital's first antimicrobial stewardship program. Using that existing work, the challenge was how to enhance the program by shifting mindsets using PCT guidance and advanced analytics.

Originally, bringing this kind of change to physicians and their protocols required superhuman effort—hundreds of hours were spent aggregating and analyzing data, then formatting and presenting it in a clear and actionable way. The first ASP reports only reflected historic data and could only be provided irregularly due to the amount of work involved in creating them. While Dr. Broyles's efforts resulted in improvements in prescribing practices, cultural change was slow, with some prescribers erroneously worrying that patients would accuse them of negligence for not prescribing antibiotics. Others were not convinced that they could get better patient outcomes with fewer antibiotics. Overall, many physicians did not understand the patient and financial impact of their prescribing practices, resistance trends, and the consequences stemming from inappropriate prescribing.

All of this ultimately impacted compliance benchmarks, hospital finances, and, most importantly, patient outcomes. Although the hospital's antimicrobial stewardship program was ahead of the curve in many ways, Dr. Broyles knew that the organization could continue to improve.

SOLUTION

When bioMérieux, Inc. approached Dr. Broyles with the idea for implementing CLARION, a software-as-a-service (SaaS) solution designed to automate ASP data aggregation, analysis, and reporting, Dr. Broyles embraced the opportunity. Leveraging existing procalcitonin (PCT) protocols, CLARION helped build a better understanding of the role of PCT in antibiotic stewardship as well as the expected clinical and health economic outcomes of PCT-guided therapy. With a smooth implementation process and development of different dashboards that cover everything from stewardship and prescribing practices to information about lab test utilization:

Dr. Broyles calls CLARION™ a “Super-Stewardship Tool.”

IMPACT

The ability of CLARION™ to track trends has been profound. “I feel like I won the lottery,” Dr. Broyles said. CLARION has given him visibility to current data in real time and provided him with the objective information he needs to practice data-driven “handshake stewardship” and change physicians’ minds as to their prescribing practices. “It allows me to go beyond any previous attempts at data collection and presentation. I can get what I need without giving months of my life to writing special queries and pouring through charts.”

Not only has it helped Dr. Broyles save time, it has also provided diverse insights the hospital needs to be more confident in its evaluations of stewardship and benchmarking. Moving forward, Physicians will be able to use the insights to further leverage PCT —and ultimately sustain these patient outcomes.



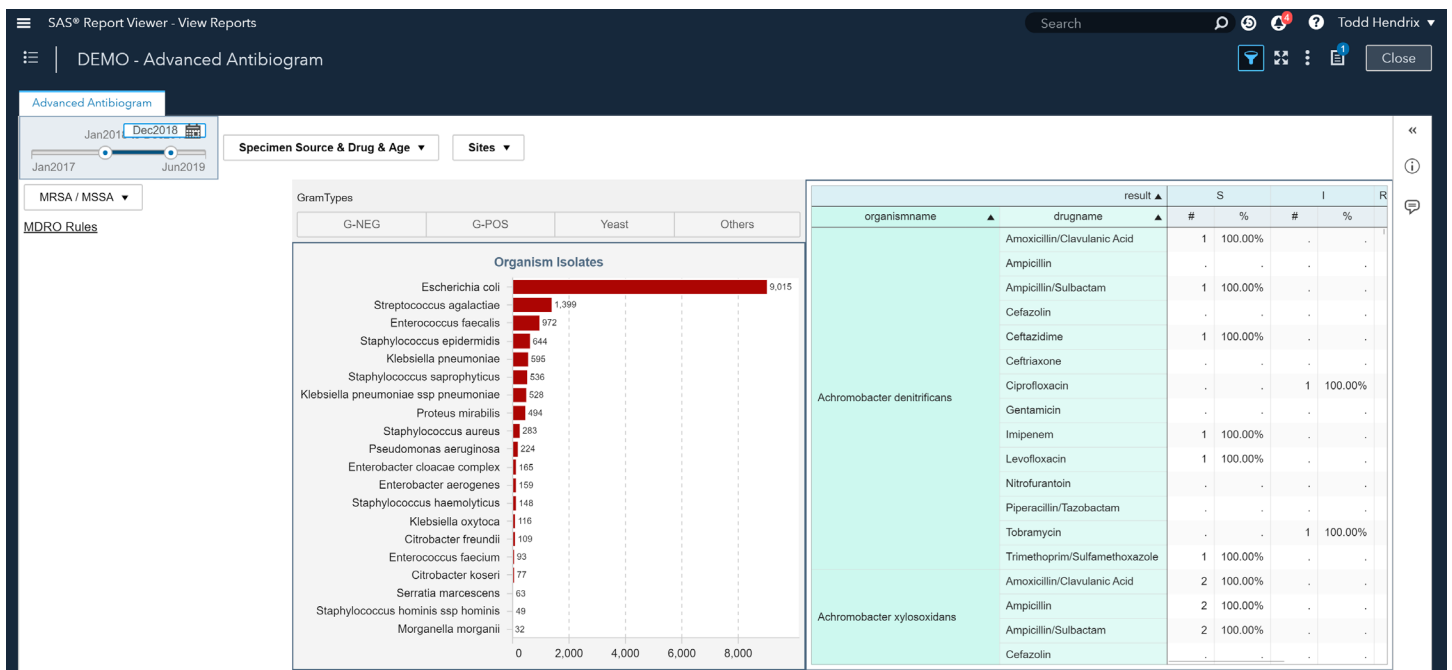


FASTER ANTIBIOGRAMS



Generally, creating a hospital's antibiogram is an arduous, annual process based on multiple data sources from the prior year. But, because CLARION integrates, consolidates, and analyzes multiple data sources in real time, Dr. Broyles can quickly generate antibiograms that target the patient types he is treating at that time.

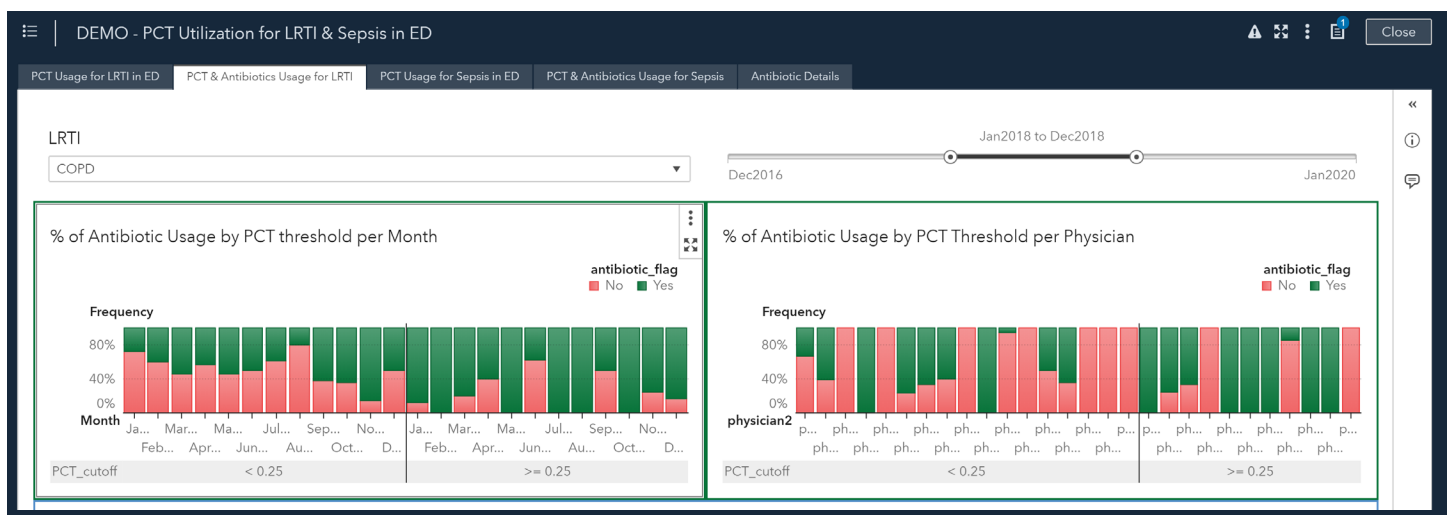
Created in just a few clicks, these CLARION-enabled antibiograms allow hospital physicians to tailor therapeutic decisions, improving patient care. Using CLARION alongside St. Bernard's Five Rivers Medical Center's stewardship practices has helped Dr. Broyles and his team quickly and easily report upon average length of patient stay, days of therapy and other CMS benchmarks for patient outcomes and compliance.



CLARION Antibiogram example

TRACKING LAB TEST UTILIZATION

The ability to track laboratory test usage, particularly PCT, has played a significant role in stewardship. Without lab data displayed in the CLARION PCT dashboard, it is more difficult to create “handshake stewardship”. The various dashboards allowed the stewardship team to have near real time and substantive discussions. For example, Dr. Broyles can now produce up-to-the-minute reports for identification of relevant patients and test ordering, use of PCT results within protocol, prescriber level protocol adherence to further data-driven best practice discussions, and the associated patient and operational outcomes.



CLARION PCT Utilization example



Not only has CLARION helped support clinical decision-making for patient care, it has also had a direct impact on decisions that affect the hospital's overall use of antibiotics. Since implementing CLARION in 2016, the hospital has continued to use CLARION to monitor its antibiotic use, with the goal of improving its antibiotic use and reducing its expenditures on those drugs. Dr. Broyles added, "CLARION allows us to continue our gains, validate what we do, and further help teach our providers. Many don't think the outcomes we discover would apply to them but CLARION helps bring awareness and action. It's all about knowing the right antibiotic, at the right time, at the right dose, that helps prevent resistance."

MEETING FUTURE HEALTHCARE CHALLENGES

The infectious diseases landscape is constantly changing, as microbes evolve, new human diseases emerge from animal populations, and antimicrobial resistance arises in unexpected places. CLARION provides the insights that hospital antimicrobial stewardship programs need to keep track of antimicrobial resistance and proactively see the trends and challenges. With an ever-expanding pool of analytic capabilities, CLARION is positioned to revolutionize the way that hospitals leverage data from the lab, pharmacy, EMR, and ADT to manage infectious diseases. "It takes us far beyond the very shallow queries of the past and extends our ability to make more intelligent evaluation of the data, implement better strategies, and objectively evaluate outcomes from strategy changes," said Dr. Broyles. "This is just the beginning."



References:

1. Broyles MR. **Impact of procalcitonin-guided antibiotic management on antibiotic exposure and outcomes: real-world evidence.** *Open Forum Infect Dis.* 2017;4(4):ofx213.
2. CDC. **Core Elements of Hospital Antibiotic Stewardship Programs.** Centers for Disease Control and Prevention. Available at: <https://www.cdc.gov/antibiotic-use/core-elements/hospital.html>. Page last reviewed: February 6, 2020. Accessed June 18, 2020.