CASE STUDY

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NMC Health Decreases Antibiotic Use Through MEDITECH's Antimicrobial Stewardship Toolkit

Introduction

According to the CDC, at least 2.8 million U.S. adults are infected with antibiotic-resistant bacteria each year, of whom 35,000 die as a result. While there's no way to prevent resistance completely, programs that enforce proper prescribing practices can help prevent it from worsening.

In an effort to implement policies and interventions to improve antibiotic use, NMC Health (Newton, KS) used three MEDITECH solutions to achieve their goals:

- Antimicrobial Stewardship Toolkit: Provided evidence-based standard content to help improve antibiotic use and prescribing practices. Built-in algorithms identify patients at key points during antibiotic therapy, and alerts communicate important events to clinicians.
- Surveillance: Enabled NMC Health to increase efficiency through centralized desktops to analyze real-time data and view watchlists that identify high-risk patients.
- Business and Clinical Analytics: Used by pharmacists and hospitalists to analyze key metrics and outcomes via dashboards, and quantify performance for NMC Health's antimicrobial stewardship committee.



SNAPSHOT

Opportunity

Implement MEDITECH's Antimicrobial Stewardship Toolkit to improve antibiotic use and prescribing practices.

Solution

MEDITECH's Antimicrobial Stewardship Toolkit, Surveillance solution, and Business and Clinical Analytics solution

Benefits

- Observed downward trend in antibiotic use (days of therapy) and administrations (a 4% decrease in total administration days)
- Reduced antibiotic cost per patient from \$9.10 per day to \$6.39 (30% decrease)
- Increased visibility and transparency between pharmacists and providers

Profile

NMC Health (Newton, KS) is a 103-bed community hospital that includes nine clinics and home health.

Challenges

Consistent communication between providers and pharmacists is critical for implementing and enforcing proper prescribing practices. However, NMC Health found that several obstacles were impeding this communication.

NMC Health's pharmacy is not open around-the-clock; six pharmacists rotate jobs on a daily basis. In NMC Health's previous workflow, pharmacists accessed two separate vendor systems to monitor and review medication orders. They had to click multiple times to view lab results, radiology reports, provider notes, and vital signs. Documentation of all reviews would occur within pharmacy clinical interventions, which was available to pharmacists but inaccessible to hospitalists.

In order to communicate with providers, pharmacists would have to copy and paste the information from the clinical intervention into a separate note document. Due to job interruptions, there were times when the note to the hospitalists was never created, or worse, the information was copied to the wrong patient's chart. This became an inefficient process and often required extensive manual cleanup.

Project goals

Like most organizations, NMC Health prioritized antimicrobial stewardship. To help overcome their challenges, NMC Health implemented the CDC Core Elements of Hospital Antibiotic Stewardship Program for guidance. However, they still had issues due to convoluted processes, and too much antibiotic use led to increased costs.

The CDC's Core Elements of Antimicrobial Stewardship

- Leadership Commitment
- Accountability
- Drug Expertise
- 🔨 Action
- 20 Tracking
- 🔋 Reporting
 - Education

Staff involved with the program realized that leadership commitment would be critical to securing resources, supporting training, and ensuring participation that would lead to better outcomes.

NMC Health's director of Health Informatics turned to MEDITECH, specifically inquiring about the Antimicrobial Stewardship Toolkit. NMC Health had confidence as an early adopter that the toolkit, which is aligned with the CDC's Core Elements and designed with Expanse technology, would address this organizational priority and help them achieve their goals.

With MEDITECH's solutions in place, NMC Health set goals to reduce the trend of antimicrobial use and identify antibiotic costs per patient day. By lowering usage, NMC Health set out to decrease multidrugresistant organisms, or antimicrobial resistance.

Early adoption

NMC Health kicked off the project in December 2018, implementing MEDITECH's evidence-based Antimicrobial Stewardship Toolkit and Surveillance solution. The medical center's project team included the following stakeholders:

- Project lead
- Pharmacy director
- · Infection control coordinator
- Quantitative risk management clinical analyst
- · Antibiotic stewardship medical staff committee

This team conducted bi-weekly calls with MEDITECH to prepare for implementation, including developing a project charter with objectives, data collection/ reporting, and expected outcomes and measures. The collaboration led to clear communication throughout the build process and was important in NMC Health's preparation as an early adopter.

"I enjoyed the early adopter process and working with MEDITECH," said Kelly Lippold, director of Health Informatics at NMC Health. "Working side by side to ensure that workflows will meet our end-users' needs, and then seeing our recommendations being used by other facilities was a great feeling."





In the initial profile build, which patients qualify for based on customizable criteria, NMC Health built the profiles according to the toolkit recommendations; the organization made only a few adjustments to suit their specific workflows. Most of the toolkit validation occurred in the LIVE environment, since NMC Health needed to enter in a significant amount of patient data and wanted to be able to see all microbiology results.

Workflows and training

NMC Health staff used the toolkit's advanced clinical decision support and guidance to align best practice workflows in Expanse. This improved collaboration between pharmacists and physicians, as the workflows centralized information and made it easier to document and review data. Once the pharmacy director and pharmacist superuser became validated as superusers, they identified workflow changes such as ensuring anyone in pharmacy would be able to review profiles. NMC Health leveraged MEDITECH's Surveillance solution to increase efficiency, using centralized, statistical desktops to analyze real-time data and view Watchlists that identify high-risk patients by displaying a list of all patients who qualify for one or more surveillance profiles. They developed a process where pharmacists access the Antibiotic Watchlist from the Surveillance Desktop, reducing watchlist columns to minimize scrolling. From there, pharmacists use onebutton access to MEDITECH's Patient Care System and their new pharmacy-specific Status Board that provides one encompassing view of medication displays and quality indicators. The pharmacy director and pharmacist superuser were trained first since they validated the workflows, making it easier for them to develop education and training for other users. NMC Health runs reports on antibiotic usage to ensure they remain on track with their objectives. Reports are shared quarterly to medical staff for transparency and there is repeated education for pharmacy, especially if wide variation in usage is seen. This includes non-IT-related educational materials to ensure all staff are on the same page.

Adoption and results post go-LIVE

NMC Health experienced benefits from the toolkit right after go-LIVE.

"It was quite a change in our process and I was a little worried that I might have to push the staff to use the system," said Pharmacy Director Allen Graber. "But because it streamlined our workflow significantly, there was immediate adoption by the staff." "It was quite a change in our process and I was a little worried that I might have to push the staff to use the system," said Pharmacy Director Allen Graber. "But because it streamlined our workflow significantly, there was immediate adoption by the staff."

Allen Graber Director of Pharmacy NMC Health



Monitoring/BCA reporting and outcomes

NMC Health is employing Antimicrobial Use and Resistance Reporting and Antibiotic Cost Reporting to analyze key metrics and positive outcomes since their toolkit implementation.

These pre-go-LIVE vs. post go-LIVE improvements include:

- 4 percent decrease in total administration days, representing a downward trend in antibiotic use (days of therapy)
- 30 percent decrease in cost per patient (per day) and total costs, gathered using MEDITECH's Business and Clinical Analytics solution

Staff is also leveraging BCA to create reports tracking total cost per antibiotic, length of stay, visit count, and prescription count. As a result, pharmacists are working more closely with hospitalists, using easily accessible, real-time dashboards to quantify their performance for the antimicrobial stewardship committee. This is raising awareness at the hospital and positively impacting antibiotic use.

Inpatient Antibiotic Cost Overview

	Pre Go-Live Average	Post Go-Live Average
Total Costs	\$10,575	\$7,377
RX Count	612	606
Cost Per Patient Day	\$9.10	\$6.39

Antibiotic Use

	Pre Go-Live Average	Post Go-Live Average
Total Admistration Days	1087	1045
Total Patient Days	1973	1969
Total Administrations per 1000 patients	550.59	531.66

Looking ahead

NMC Health will continue to leverage the clinical decision support, real-time surveillance, and system guidance offered in MEDITECH's Antimicrobial Stewardship Toolkit to improve antibiotic outcomes. Staff is looking forward to creating more reports on time savings to measure the amount of time pharmacy spends on documentation process hours and salary saved.





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