

770. Multimodal Sepsis Performance Improvement Initiative Improves Early and Appropriate Treatment, Reduces Sepsis-related Readmissions, and Reduces Overall Mortality

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Background. CMS has implemented the SEP-1 Core Measure, which mandates that hospitals implement sepsis quality improvement initiatives. At our hospital, a 900-bed tertiary hospital, a sepsis performance improvement initiative was implemented in April 2016. In this study, we analyzed patient outcomes before and after these interventions.

Methods. We studied coding data in patients with a diagnosis of Sepsis reported to CMS using a third-party performance improvement database between October, 2015 and July, 2017. The interventions included a hospital-wide education campaign about sepsis; a 24–7 electronic warning system (EWS) using SIRS criteria; a rapid response nursing team that monitors the EWS; a 24–7 mid-level provider team; a database to monitor compliance and timely treatment; and education in sepsis documentation and coding. We performed a before and after analysis of patient outcomes.

Results. A total of 4,102 patients were diagnosed with sepsis during the study period. 861 (21%) were diagnosed during the pre-intervention period and 3,241 (80%) were diagnosed in the post-intervention period. The overall incidence of sepsis, severe sepsis, and septic shock were 59%, 13%, and 28% consecutively. Regression analysis showed age, admission through the ED, and severity of illness as independent risk factors for increased mortality. Adjusted for these risk factors, the incidence of severe sepsis and septic shock was reduced by 5.3% and 6.9% in the post-intervention period, while the incidence of simple sepsis increased by 12%. In the post-intervention period, compliance with all 6 CMS mandated sepsis bundle interventions improved from 11% to 37% ($P = 0.01$); hospital length of stay was reduced by 1.8 days ($P = 0.05$); length of stay above predicted was less by 1.5 days ($P = 0.05$); re-admission rate was reduced by 1.6% ($P = 0.05$); and death from any sepsis diagnosis was reduced 4.5% ($P = 0.01$). Based on an average of 2000 sepsis cases at our hospital, this amounted to 90 lives saved per year. Death from severe sepsis and septic shock both were also reduced by 5% ($P = 0.01$) and 6.5% ($P = 0.01$).

Conclusion. A multi-modal sepsis performance improvement initiative reduced the incidence of severe sepsis and septic shock, reduced hospital length of stay, reduced readmission rates, and reduced all-cause mortality.

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771. A Quality Improvement Initiative to Reduce 30-days Sepsis-Related Readmissions by Internal Medicine Residents

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Background. Early readmissions after sepsis treatment are associated with an increased cost of care and poor outcome. Based on nationwide Medicare data, one-third of sepsis survivors get readmitted and wide variation exists between hospitals. Internal medicine residents aimed to determine the most common factors associated with readmission after hospitalization for sepsis at Rochester General Hospital and Unity Hospital in Rochester, New York.

Methods. This quality improvement (QI) project involved a retrospective chart review of 30 days sepsis-related readmissions from January to July 2017. We used Rochester General Hospital and Unity Hospital electronic database of the admitted patients with ICD 9/ICD 10 diagnoses for sepsis at admission or during the hospital course. This data were used for interpreting predominant risk factors for readmission. Based on the specific determinants, a “readmission alert” is being implemented in the electronic medical record to address the specific area of concern with relevant interventions. In the next phase of the performance improvement, six-monthly follow-up retrospective chart review will be carried out to look for the outcome.

Results. Of 2,221 patients admitted with a sepsis diagnosis from January to July 2017, 462 (20.8%) were readmitted within 30 days of discharge of which the majority were older than 65 years (66.4%). 66 (16.6%) patients had a septic shock on readmission and 19.3% died within 30-days of discharge after readmission. In 39.7% of cases, there was no primary care provider (PCP) communication at discharge. In 137 (65.5%) cases, Infectious disease (ID) consults service was not involved in care on initial admission. 242 (60.8%) readmitted patients had a follow-up clinic appointment more than a week after discharge. 12.5% of patients were discharged with IV antibiotics on initial admission, whereas 32.9% of the readmitted patients were not provided visiting nursing services after initial discharge.

Conclusion. Reducing sepsis-related readmission requires a multidisciplinary collaboration of primary care providers, visiting nursing services and infectious disease consult team. This pilot QI project results indicate that early follow-ups are important for reducing readmission.

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772. Access Denied: Impact of Insurance Denials for High-Cost Outpatient Parenteral Antimicrobial Therapy

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Background. Outpatient parenteral antimicrobial therapy (OPAT) allows patients to receive prolonged antimicrobial therapy while reducing the length of hospitalization and healthcare costs. In the United States, most public and private insurance companies require prior authorization (PA) for OPAT. The impact of OPAT PA delays is not known. This study aimed to characterize discharge barriers and authorization delays associated with high-cost OPAT antibiotics.

Methods. IRB-approved study of adult patients discharged with high-cost OPAT antibiotics from January to December 2017. Antibiotics were included based on the frequency of OPAT use and average sales price (ASP) greater than \$100 per day, including: daptomycin, ceftaroline, erapenem, and the novel β -lactam β -lactam inhibitor combinations. Patients with an OPAT authorization delay >24 hours were compared with patients without an OPAT authorization delay. Primary endpoint: total direct hospital costs, starting from the start of treatment with the OPAT antibiotic, from the institutional perspective using Healthcare Cost and Utilization Project and Center for Medicare and Medicaid Services 2019 ASP Drug Pricing data. Secondary outcomes: discharge delay and 30-day readmission or mortality.

Results. Two-hundred patients included: 151 (76%) no OPAT delay vs. 49 (25%) OPAT delay. The use of antibiotics was similar between groups, except erapenem was more common in the no OPAT delay group: 60 (43%) vs. 15 (25%), $P = 0.022$. Patients with no OPAT delay were more commonly discharged with home infusion and less commonly to a facility: 75 (53%) vs. 19 (32%), $P = 0.007$, and 52 (37%) vs. 37 (63%), $P = 0.001$, respectively. Discharge delays were more common in patients with OPAT delays: 21 (15%) vs. 31 (53%), $P < 0.001$. The median total direct hospital costs were higher in patients with OPAT delays: \$7,770 (3,031–13,974) vs. \$19,576 vs. (10,056–37,038), $P < 0.001$. Table 1 compares the total direct hospital costs of patients with and without an authorization delay.

Conclusion. OPAT with high-cost antibiotics requires significant care coordination. Authorization delays for these antibiotics are common and may contribute to a delay in discharge. OPAT transitions of care represent an important opportunity for Infectious Diseases providers to improve care and address access barriers.

Table 1. Total direct hospital cost per patients who did and did not experience an OPAT authorization delay.

	No OPAT delay (n=141)	OPAT delay (n=59)	Total (n=200)	P-value
Days from treatment start to discharge, median (IQR)	3 (1-5)	7 (4-13)	4 (2-7)	<0.001
Cost per stay per patient from treatment start, median (IQR)	\$7,341 (2,447-12,235)	\$17,129 (9,788-31,811)	\$9,788 (4,894-17,129)	<0.001
Antibiotic-associated costs per patient, median (IQR)	\$455 (224-873)	\$965 (268-2,815)	\$530 (263-1,275)	0.011
Total direct hospital cost per patient, median (IQR)	\$7,770 (3,031-13,974)	\$19,576 (10,056-37,038)	\$10,284 (5,216-19,731)	<0.001

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773. First National Survey of Antibiotic Use Prescribed by All Dentists in Japan from 2015 to 2017 using the National Database of Health Insurance Claims and Specific Health Checkups of Japan (NDB)

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Background. The surveillance of antimicrobial use (AMU) among medical doctors and dentists is a key component of the Japanese national plan on antimicrobial resistance (AMR). However, there are no epidemiological studies of AMU among dentists in Japan. We aimed to evaluate the epidemiology of AMU among dentists in Japan and investigate the factors affecting inappropriate prescribing.

Methods. Total AMU among dentists in Japan between 2015 and 2017 was analyzed by using the National Database of Health Insurance Claims and Specific Health Checkups of Japan (NDB), from the Ministry of Health, Labor and Welfare of Japan, which accounted for 98% of total claim data in Japan. Antimicrobials were classified by the World Health Organization (WHO) Anatomical Therapeutic Chemical Classification. The WHO measures antimicrobial usage by using the Defined Daily Dose per 1,000 inhabitant-days (DID) parameter. The patterns of oral AMU in 2017 in outpatient settings were compared between in-house and outside prescriptions.

Results. DID values of total AMU in 2015, 2016, and 2017 were 1.23, 1.22, and 1.21, respectively (Figure 1). In 2017, the DID value of oral AMU in outpatient settings