
The UNM Journey for Improving Care of Patients with Sepsis Syndrome

RICHARD CROWELL, MD, Chief Quality Officer, UNM Health Systems; Professor, Department of Internal Medicine
ELIZABETH COLOMBO, MD, Internal Medicine Chief of Quality Improvement

Sepsis syndrome is a systemic inflammatory response to infection that ranges from a simple systemic response to local infection (sepsis) to organ dysfunction (severe sepsis) to (septic) shock. Sepsis syndrome is one of the most common causes of death in patients at University of New Mexico Hospital (UNMH). However, the mortality rate associated with sepsis has continuously improved over the last few years, largely related to the Sepsis Mortality Improvement Team (SMITe) and its associated multidisciplinary team. Begun in 2008 as a pilot program, the SMITe program has grown to become one of the major focus areas for Quality Improvement for UNMH and the UNM Health System.

The SMITe team was formed in response to a high sepsis mortality rate in UNMHospital (UNMH) patients, and was established with collaboration of Nursing Unit Directors, Quality Outcomes from UNMH, and physicians within the Departments of Internal Medicine and Surgery. Initial goals included early recognition of patients with sepsis syndrome and initiation of appropriate evaluation and treatment efforts. These goals were introduced as a 6 hour Early Goal-Directed Therapy (EGDT) bundle of care based on recommendations of the international Surviving Sepsis Campaign but specifically tailored to UNMH systems and the needs of our patient population. Initial efforts focused on 4-West and 5-West wards, inpatient units with large proportions of Internal Medicine Service patients. However, by mid-2009 the program had expanded to include inpatient wards throughout the hospital. Improvements were noted quickly; the number of sepsis cases identified and documented at UNMH almost tripled within a year, and observed mortality and mortality index (observed divided by expected mortality) in sepsis patients decreased significantly.

While these results were all encouraging, several important observations were also made over the first year. The majority of patients with sepsis were

admitted through the ED, particularly patients with occult (lactate >4) and frank hemodynamic septic shock. While these patients represented the sickest patients with sepsis syndrome, the process for deciding appropriate admission disposition was highly variable, poorly coordinated, and extremely time-consuming. Patients often did not receive the EGDT bundle in the appropriate time frame, or ended up admitted to a non-Intensive Care unit (ICU) only to be transferred to an ICU when they deteriorated, often with the next 24-48 hours. These results suggested that the initial improvements in mortality related to institution of the SMITe program may have been more related to improved recognition and treatment of patients with mild-to-moderately severe sepsis, but mortality of the patients with septic shock was minimally impacted.

To address these issues, in late 2009 the Departments of Internal Medicine and Emergency Medicine collaborated to develop a SMITe subgroup called the "ED to ICU Workgroup". The goal of this workgroup was to develop an early recognition and rapid treatment process that could be initiated through the ED. The workgroup included physician, nursing, and pharmacy leaders as well as frontline personnel from the Emergency Department and Medical ICU (MICU). This team focused on a) identification of highest risk patients for rapid initiation of the severe sepsis bundled protocol and b) rapid transfer to the MICU. UNMH provided strong support of the initiative by ensuring ongoing data collection support, and by sponsoring the workgroup's participation in a nationwide collaborative sponsored by the Institute for Healthcare Improvement (IHI) addressing the same issues. The program officially began in November, 2009, and rapid improvement in mortality was noted within 6 months, going from an initial observed mortality in patients who met septic shock criteria of >40% at the start of the project to a mean of 26.7%

for the first 6 months of 2010. Since then, there has been a slow, sustained decrease in observed mortality in patients admitted as part of this program to 21.5% over the last 6 months of 2013.

It is worth noting that our approach to improving sepsis mortality at UNMH have been based on classic QI principles and approaches. The importance of developing a cohesive, effective multidisciplinary team cannot be overstated. The ED to ICU Workgroup has maintained stable leadership and sustained multidisciplinary participation since the program began in 2008, with membership from UNMH Nursing units, the Departments of Emergency Medicine and Internal Medicine, and Pharmacy. The team has also benefitted from resident and fellow participation at various points in the improvement process, including: a) improvement of ED to MICU EGDT transitions through identification of specific signs and symptoms that should trigger ICU admission, b) clearly identifying expectations and lines of responsibility for individual bundle elements between ED and MICU personnel, and c) improving central venous catheter placement rates to almost 90% during the last 6 months of 2013. Importantly, there has been continuous support from departments and UNMH to maintain ongoing data collection and analysis. This has allowed projects evaluating new processes of care, change implementation, and feedback to involved providers to be data-driven. Finally, continuous executive leadership support from Departments within the School of Medicine

and UNMH have helped reinforce changes in culture necessary to affect long-term improvements in the care of these patients.

However, challenges remain related to the care of patients with sepsis at UNMH. Continuous rotations of trainees through the ED and MICU present ongoing challenges in education and feedback. While we have made significant improvements in overall sepsis mortality, the proportion of UNMH sepsis patients who develop the disease after admission (non-present on admission, or non-POA) continue to have high rates of ICU transfer and mortality. This subgroup includes patients with significant co-morbidities, post-operative patients, and patients with prolonged lengths of stay. These are important variables measured regularly for public reporting and inclusion in pay for performance programs such as Value-Based Purchasing. Earlier this academic year another initiative was begun to address this patient subpopulation, and the “non-POA Sepsis Team” became a member of the SMITe program. In late 2013, this team was accepted into a national collaborative focused on improving mortality in non-POA sepsis patients. The team will work with teams from throughout the US to improve processes of care involved in early recognition and treatment of non-POA patients on non-ICU wards. We anticipate that this team will make significant contributions to improving the care of sepsis patients, and look forward to resident participation as this initiative moves forward.