Six-Hour Protocol Cuts Sepsis Mortality in Half

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PHOENIX, ARIZ. — In-hospital sepsis mortality was reduced from 42% to 22% with a 6-hour protocol of rapid interventions, H. Bryant Nguyen, M.D., reported at a meeting sponsored by the Society of Critical Care Medicine.

Data on 208 sepsis patients treated from the start of the program in October 2003 through the end of 2004 show that the greatest benefit occurs when the protocol is completed on time, said Dr. Nguyen of Loma Linda (Calif.) University.

Mortality was 12.5% among the 24 patients who received all of the interventions within 6 hours, but was 34.2% among the 184 patients in whom the "STOP Sepsis Bundle" protocol was started but not completed within 6 hours. The difference in mortality was highly significant (P =.008).

STOP stands for Strategies to Timely Obviate the Progression of Sepsis in the Emergency Department. Dr. Nguyen modeled the STOP Sepsis Bundle protocol after the 6-hour Severe Sepsis bundle promoted by the Institute for Healthcare Improvement (IHI) and the international Surviving Sepsis Campaign (SSC).

Early goal-directed therapy 'is easy to initiate but appears to be the most challenging component to complete.'

As presented by Dr. Nguyen, Loma Linda's STOP Sepsis Bundle is set in motion for patients who meet three criteria: systemic inflammatory response syndrome (SIRS), a source of infection, and any one of the following: a systolic blood pressure less than 90 mm Hg after a 20 mL/kg fluid bolus, a serum lactate level of 4 mmol/L or higher, or more than one acute organ dysfunction.

The protocol comprises five components, of which the first three must be completed within 6 hours:

► Begin hemodynamic monitoring (central venous pressure [CVP] and central venous oxygen saturation [$ScvO_2$]) within 2 hours.

► Start broad-spectrum antibiotics within 4 hours.

► Use early goal-directed therapy (EGDT), with these goals to be achieved within 6 hours and maintained until admission: CVP of at least 8 mm Hg, mean arterial pressure (MAP) of at least 65 mm Hg, and $ScvO_2$ of at least 70%.

► Obtain serial lactate levels to monitor for lactate clearance.

► Initiate corticosteroid treatment if the patient is on a vasopressor.

Dr. Nguyen said he focused on goals to be achieved rather than methods in customizing the SSC/IHI bundle. His modifications drew praise from Jean-Louis Vincent, M.D., a member of the SSC panel who worked on its sepsis bundle. Dr. Vincent, chair of the department of intensive care at Erasme University Hospital in Brussels, chaired the sepsis research session at the meeting.

"You have not really implemented the bundle of the Surviving Sepsis Campaign," he told Dr. Nguyen. "You have implemented a better bundle. … You changed it to improve it."

Dr. Nguyen described a gradual implementation process in which bundle components were added at 3-month intervals. The phase-in started with staff education, and included nursing in-service training sessions every 6 months, grand rounds, quality improvement reports every 2 months, and continuous review of data.

"EGDT is easy to initiate but appears to be the most challenging component to complete," said Dr. Nguyen.

Patients who received the complete bundle not only had a survival advantage, they had shorter lengths of stay in the hospital (although the difference was not statistically significant): 8.1 days vs. 11.9 days for the larger cohort of sepsis patients (P = .06). "Completion of the bundle is associated with improved outcome and possibly a decrease in resource consumption in terms of length of stay," he concluded.

The staff has reached the point where it is comfortable with the arduous protocol, he added. "We treat them [sepsis patients] as a trauma patient. We treat them as a cardiac arrest patient. We invest the time for 2-3 hours," he said. "If we don't, in 6 hours they arrest." ■