Session: Sepsis

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Title: The Impact of Crowding Upon Implementation of Early Goal Directed Therapy in the Emergency Department.

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Abstract: **Background:** Optimal management of severe sepsis patients includes early identification, aggressive resuscitation, including Early Goal-Directed Therapy (EGDT) in eligible patients, and timely administration of intravenous fluids (IVF) and antibiotics. Critically ill patients require significant time commitments and care coordination in emergency departments (ED), which are treating expanding populations while lacking a sufficient provider workforce.
Objectives: We hypothesized that increased ED crowding would decrease utilization of EGDT, delay time to IVF and antibiotics, and increase mortality for EGDT-eligible patients.
Methods: Retrospective chart review of EGDT-eligible (lactate > 4 mmol/L or persistent hypotension) severe sepsis patients (≥2 SIRS criteria; a confirmed or suspected source of infection; presence of at least one acute organ dysfunction), admitted to an urban, level I trauma center from the ED, 5/2008-2/2010. Four validated measures of ED crowding (ED occupancy, waiting patients, admitted patients, and patient-hours) were assigned to each patient at the time of triage and the associations between

them and time to antibiotics and fluids or receiving EGDT were tested by analyzing trends across crowding quartiles, using analysis of variance on the ranks or Cochran-Armitage trend tests, respectively.

Results: 1,095 EGDT-eligible severe sepsis patients were identified; 675 were treated with EGDT. Mean age was 58.9 years; 43% were Caucasian; 53% African-American, in-hospital mortality was 26%. Significant decrease in EGDT implementation occurred as ED inpatient boarding increased; time to IVF increased as boarding ED patients increased and time to antibiotics trended similarly as boarding ED patient hours increased (Table 1). Mortality was not affected by crowding parameters.

Conclusion: Boarding admitted inpatients within the ED decreases the initiation of EGDT for patients in EGDT-eligible severe sepsis patients. Times to critical interventions (IVF, antibiotics) were also significantly increased as ED patient hours and inpatient boarding increased. These differences may represent changes in ED staffing, triage methods, or location of EGDT initiation. As crowding increases, EDs must create systems that optimize delivery of time-sensitive therapies to critically ill patients.

Table 1: ED Crowding Impact upon Likelihood of EGDT and Critical Interventions

	Lowest Quartile (Lower Crowding)	Second Quartile	Third Quartile	Highest Quartile (Increased Crowding)	*p* -value
EGDT: Patients Meeting Criteria (%)					
ED Occupancy Rate	58.5	59.0	66.5	66.1	0.434
ED Patient Hours	60.7	61.4	63.8	64.1	0.352
ED Boarding Admissions	71.3	63.8	61.2	50.5	<0.0001
Waiting Patients	60.5	62.3	61.6	65.9	0.252
EGDT: Mortality (%)					
ED Occupancy Rate	28.6	23.6	25.3	30.6	0.910
ED Patient Hours	26.7	29.1	24.0	27.6	0.946
ED Boarding Admissions	30.4	27.3	21.2	28.6	0.541
Waiting Patients	27.0	36.5	18.8	23.8	0.236
EGDT: Receiving IVF ≤ 1 hour (min)					
ED Occupancy Rate	28.0	32.3	33.0	37.5	0.262
ED Patient Hours	31.5	33.0	28.0	43.0	0.170
ED Boarding Admissions	33.0	26.0	35.5	42.0	0.049
Waiting Patients	37.0	32.5	28.0	34.0	0.145
EGDT: Receiving ABX ≤ 1 hour (min)					
ED Occupancy Rate	103.0	110.0	112.0	124.0	0.180
ED Patient Hours	98.5	104.5	117.0	121.5	0.009
ED Boarding Admissions	111.0	110.0	106.0	117.5	0.159
Waiting Patients	116.0	100.5	115.0	113.5	0.802

Early Goal Directed Therapy (EGDT), Intravenous Fluids (IVF), Antibiotics (ABX), Minutes (min)
Values reported as % or minutes as noted