



# INTERACTION OF SURGERY WITH SEPSIS MORTALITY: PREDICTING SEPTIC SHOCK OUTCOMES IN PATIENTS WHO EXPIRED FROM SEPTIC SHOCK (ESS), EXPIRED POST-DISCHARGE (EPD), AND WHO SURVIVED (S)

Luke Perry, Christopher Bashian, and Gus J Slotman  
Department of Surgery Inspira Health Network, Vineland, NJ

## INTRODUCTION

- Current sepsis scores do not differentiate ESS v EPD v S, such as APACHE II, REMS, and MODS.
- The prediction of ESS and EPD outcomes could facilitate data-directed interventions that would reduce septic mortality.

The objective is to identify clinical variations during septic shock admissions that predict ESS, EPD and S differentially allowing clinicians to begin more targeted interventions.

## Methods

- The septic shock admission data on 5,030 patients at a community hospital was studied in three groups: 739 ESS (15%), 137 EPD (3%), and 4,154 S (82%).
- Analysis was completed via ANOVA and Chi-squared.

## Results

TABLE 1: EXPIRED IN SEPTIC SHOCK (ESS), EXPIRED POST-DISCHARGE (EPD) AND SURVIVED (S)

	ESS	ESD	Survived	p-value
Age >50 years	93%	93%	83%	<0.0001
Medicaid	8%	4%	17%	<0.0001
Medicare	79%	77%	68%	<0.0001
Sepsis	17%	15%	8%	<0.0001
Abdominal surgery	7%	70%	5%	<0.05
Cardiac Surgery	11%	19%	9%	<0.05
Non-cardiac thoracic surgery	14%	17%	6%	<0.0001
Urologic operation	1%	0%	5%	<0.05
Hemodynamic monitoring	2%	0%	1%	<0.01
Head & neck surgery	0%	4%	0%	<0.0001
Central line	9%	0%	7%	<0.01
Mechanical Ventilation	18%	7%	9%	<0.05
Neurosurgery	2%	35%	3%	<0.0001
Orthopedic Surgery	2%	3%	4%	<0.05
Peripheral vascular surgery	8%	1%	5%	<0.05
Skin/soft tissue surgery	1%	12%	4%	<0.01
Blood transfusions	10%	2%	8%	<0.05
Length of stay	41 Days	47 Days	47 Days	<0.01

## CONCLUSION

- The clinical characteristics, surgical procedures, and organ system variations during sentinel septic shock admissions predict ESS, EPD, and S outcomes.
- ESS patients were older, had Medicare, and had the highest rates of abdominal/vascular surgery, mechanical ventilation, hemodynamic monitoring, central line placement, and blood transfusion. All this data suggests highest ESS acuity and early demise during septic shock admission.
- The lowest incidences of head and neck, neurosurgical, orthopedic, and skin/soft tissue surgery also predicted ESS, with the lowest length of stay reflecting the highest septic shock acuity and early demise.
- EPD had the highest LOS indicating a complicated clinical course.
- The highest occurrences of cardiac, head/neck, neurosurgical, skin/soft tissue, and thoracic operations, and lowest urologic/vascular surgery, hemodynamic monitoring, and central line placement predicted EPD.
- Survivors (S) underwent the highest rates of urologic, orthopedic, and vascular surgery, and had the lowest sepsis primary diagnosis and cardiac/thoracic surgery.
- Recognizing ESS and EPD characteristics and surgical interventions that predict mortality could heighten the surgeons' index of suspicion for these patients during septic shock admissions.
- This advance knowledge could facilitate data-directed early management and possibly improve septic shock survival for some ESS and EPD individuals.