

THE EFFECTS OF SEA STATES ON THE ABILITY TO PERFORM RESUSCITATION IN A NAVAL FORWARD SURGICAL UNIT

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BACKGROUND

- ▣ Asymmetric warfare and damage control surgery.
- ▣ Need for closer trauma resuscitation.
- ▣ The application of forward surgical units on United States Navy non-conventional ships close to the theater in high sea states.



Nov. 14, 2015, *USNS Brunswick*. Retrieved from <http://www.dmitryshulgin.com/tag/usns-brunswick-t-epf-6/>

OBJECTIVES

- ▣ To assess the ability to perform resuscitative measures under moderate to high sea states on a non-conventional United States Navy ship.
- ▣ Determine the resuscitative procedures that can be performed during high sea states in theater.

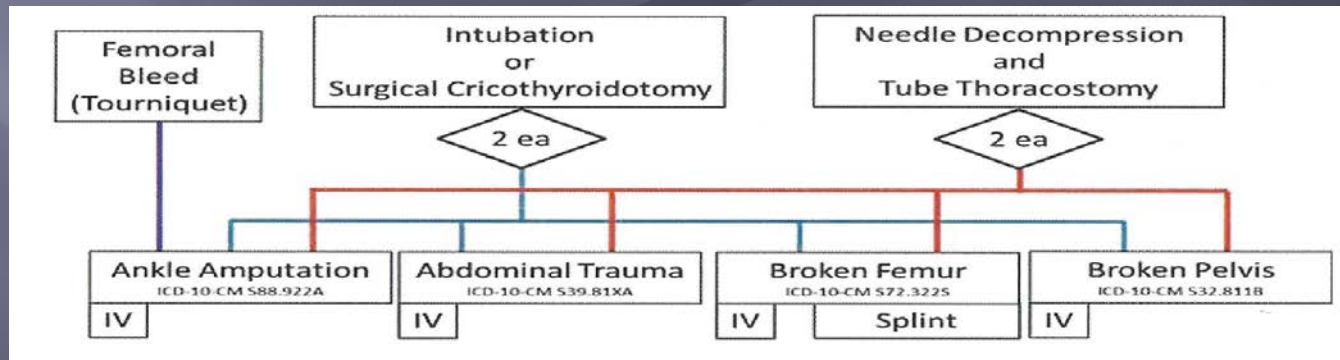
I, Joshua M. Smith, BS, EMT-P do not have any significant financial relationships to report.

Design and Methods

Time Zone	Eastern							
Day	MON	TUE	WED	THU	FRI	SAT	SUN	MON
Date	30	31	1	2	3	4	5	6
Activity	Ship Departs Norfolk/ Training	Record Test	Record Test	Record Test	Record Test	Record Test	Rest Day	Record Test (Canal Transit)
Sea State		3-4	2	4	4	4		0-1
# Patients		8	8	12	12	8		4 4
RED TEAM		Surg	Resus	Surg	Resus	Surg		Resus Surg
BLUE TEAM		Resus	Surg	Resus	Surg	Resus		Surg Resus

Time Zone	Central		Mountain		Pacific				
Day	TUE	WED	THU	FRI	SAT	SUN		MON	TUE
Date	7	8	9	10	11	12		13	14
Activity	Record Test	Record Test	Record Test	Record Test	Record Test	Record Test		Disassembly	Ship Arrives San Diego
Sea State	2	3-4	1	2	2-3	3-4			
# Patients	8	8	8	8	12	4	4	4	
RED TEAM (RECONSTITUTED)	Surg	Resus	Surg	Resus	Surg	Surg	Surg	Resus	
BLUE TEAM (RECONSTITUTED)	Resus	Surg	Resus	Surg	Resus	Resus	Resus	Surg	

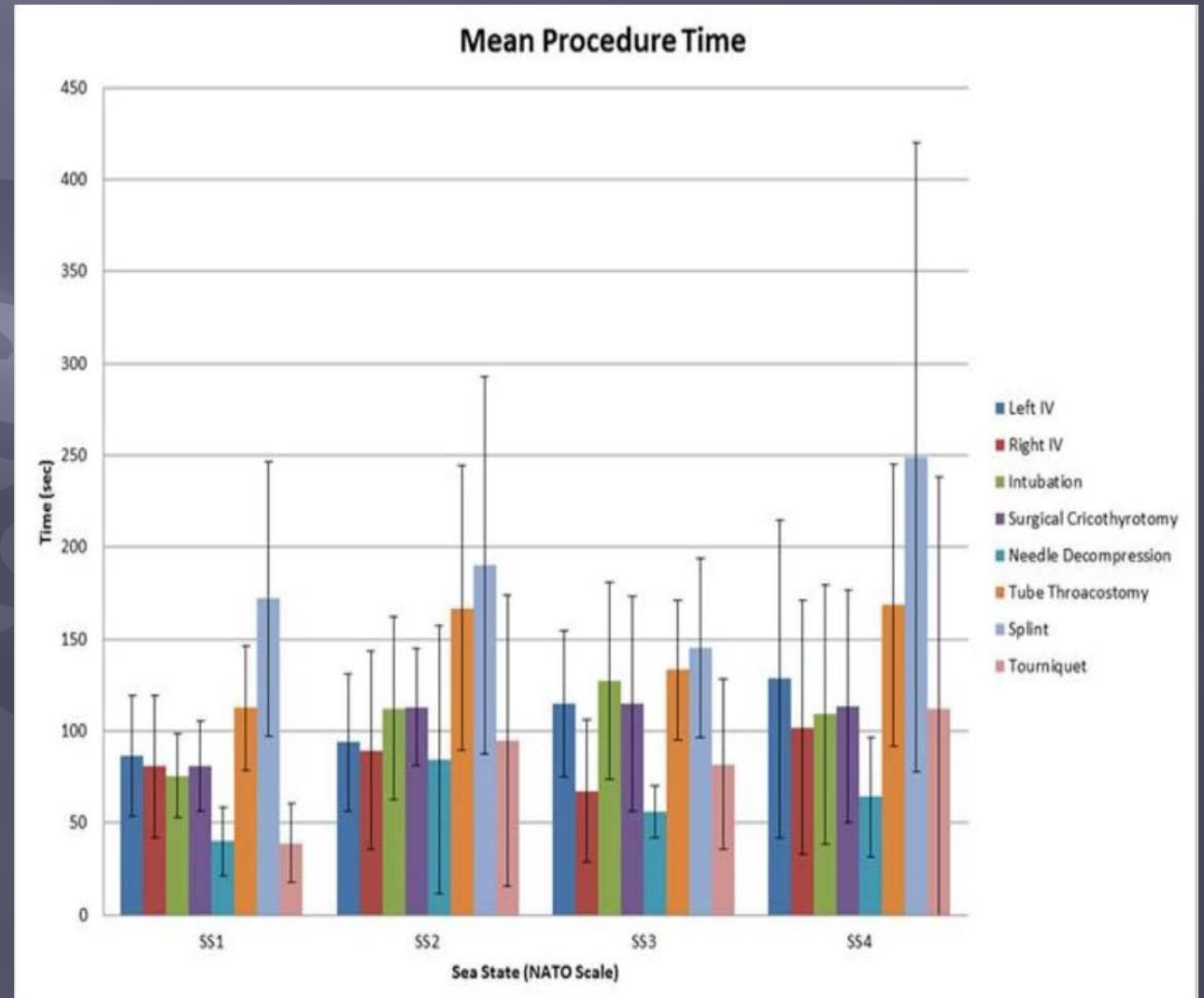
Shipboard Schedule



Combinations of Resuscitation Procedures for One 4-hour/Four Surgical Procedure Test Block

Results

- Expected time increases as sea states increased
- Left IV start times
- Progression of the voyage and decreased times in sea state 4



Implications and Impacts

- ▣ Implications:
 - Life-saving procedures should occur in a timely manner. This often occurs in conditions that are less than ideal in asymmetric warfare and damage control surgery
 - We should train in conditions that simulate conditions that are at or worse than the conditions we expect.
- ▣ Impacts:
 - Although there are limitations of this small study, it shows us that resuscitation can occur under less than ideal conditions, and that it is feasible to move modular Forward Surgical Teams to non-conventional platforms in the US Navy.

Limitations & Future Research

- ▣ Limitations
 - Small, limited study
- ▣ Future Research
 - Future research needed to determine if patient outcomes improve
 - Transition of this research to civilian trauma resuscitation

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