SEPSIS SIMULATION
THE CMHS EXPERIENCE

COMMUNITY MEMORIAL HEALTH SYSTEM

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STROKE AND SEPSIS TASK FORCE CHAIR

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TREASURER, GAMMA BETA PHI HONOR SOCIETY

FIRST RESEARCH ASSISTANT FOR NURSING DEPARTMENT

OUTSTANDING CLINICAL PRACTICE AWARD

OUTSTANDING COMMUNITY ENGAGEMENT AWARD

CONGRESSIONAL RECOGNITION FOR ACADEMIC ACHIEVEMENT

DEVELOPED 1ST TRAINING MANUAL & COMPETENCY CHECKLIST FOR TRANSPORTERS (CMH)

COMMUNITY MEMORIAL HEALTH SYSTEM

VENTURA COUNTY, CA

- ▷ **COMMUNITY MEMORIAL HOSPITAL**
- ▷ **OJAI VALLEY COMMUNITY HOSPITAL**
- ▷ **12 CENTERS FOR FAMILY HEALTH**

COMMUNITY MEMORIAL HOSPITAL
VENTURA, CALIFORNIA

COMMUNITY MEMORIAL HOSPITAL

▷ **242 BED NOT-FOR-PROFIT HOSPITAL**

▷ **ACCREDITED BY DEL NORTE VERITAS (DNV)**

▷ **TEACHING HOSPITAL- MEDICAL RESIDENCY PROGRAM**

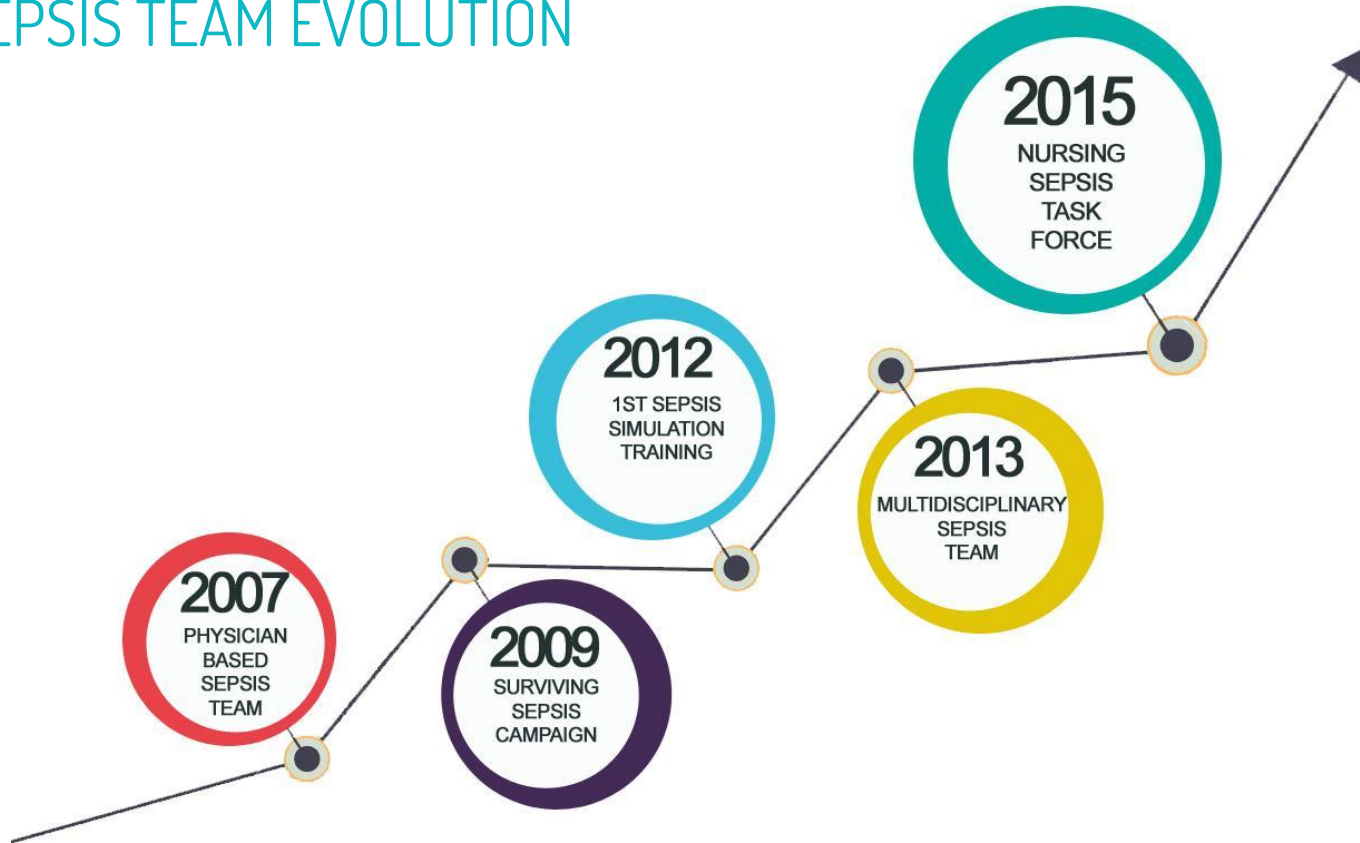**Community Memorial Health System**

Where Excellence Begins with Caring

SEPSIS AT CMH

Retrieved from : https://riordanclinic.org/2014/04/ivc-and-sepsis-a-follow-up/

COMMUNITY MEMORIAL HOSPITAL SEPSIS TEAM EVOLUTION

SEPSIS SIMULATION EXPERIENCE

Community Memorial Health System

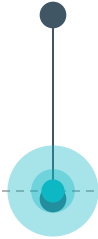*Where Excellence Begins with Caring*

2016 SEPSIS SIMULATION

CLinical Roles

- MD — 3, 10%
- ED RN — 8, 25%
- Educator/Coordinator — 2, 6%
- House Supervisor — 2, 6%
- ICU RN — 5, 16%
- MBU RN
- MedSurg/Tele RN — 11, 34%
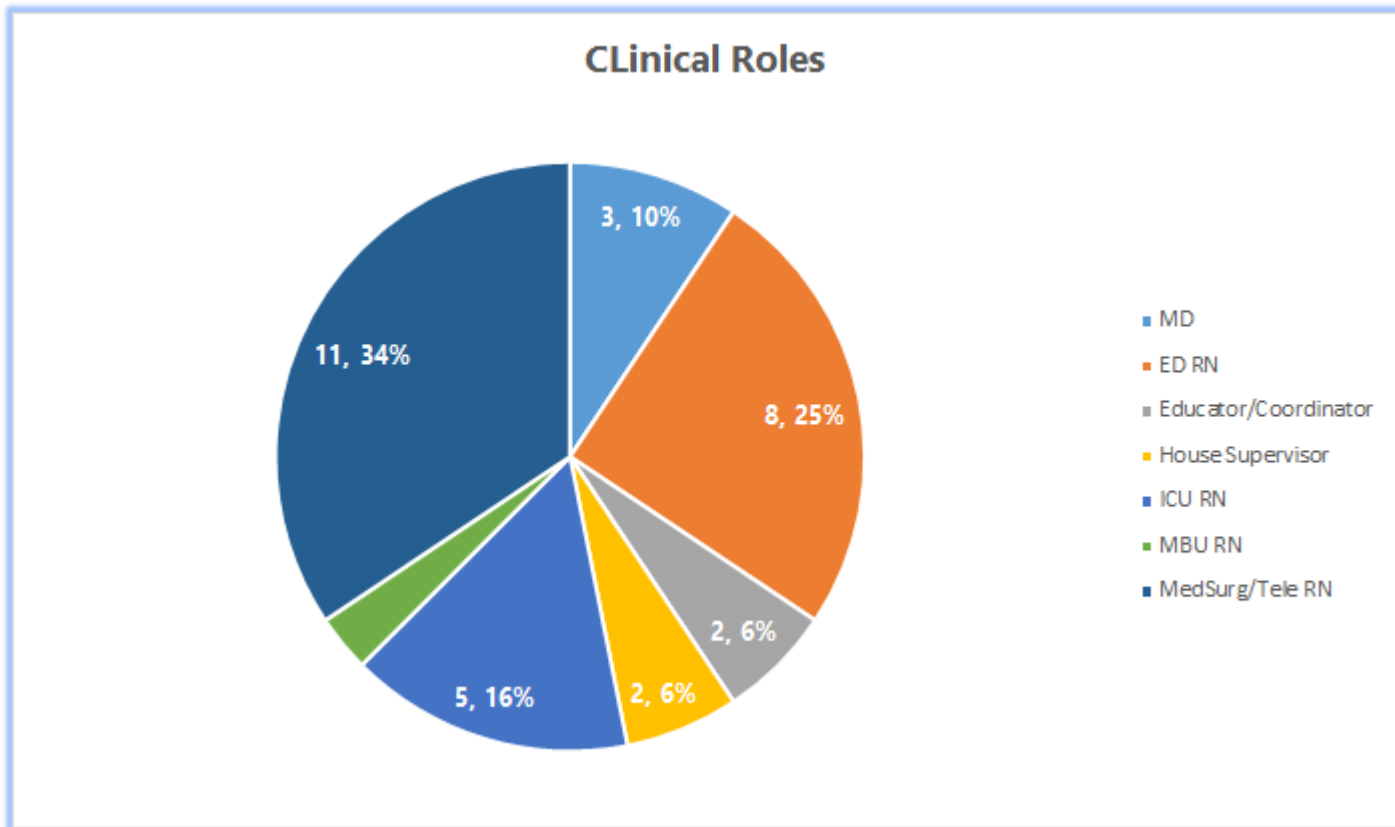
33%

INCREASE IN SEPSIS KNOWLEDGE

LESSONS LEARNED

TIME

BACK UP LIST

SPACE & SUPPLIES

WI-FI ACCESS

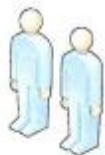# PLANS FOR THE FUTURE

DISSEMINATION OF KNOWLEDGE

CONTINUE RESEARCH

SEPSIS NURSING PROTOCOL

SEPSIS ALERT PROTOCOL

SIRS + Suspected Infection = SEPSIS

Pt meets SIRS criteria & Infection is Suspected.
Eval by RN & Charge Nurse. Follow MEWS Score for Sepsis.
MEWS Score >3, Call Sepsis Alert.

Sepsis Alert Protocol

STAT CBC with Diff, BMP, PT, INR
STAT Lactate
STAT Blood Cultures x 2 sets (4 bottles) & 2 different sites
500cc NS Bolus
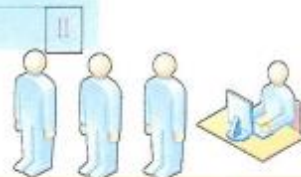
Phlebotomist Responds

Draws Labs STAT

Pharmacy Responds

Pharmacy to start chart review in pharmacy dept.
-On antibiotics? Culture results? Review patient profile.

MD Notification: If on Abx, wait for results. If not on Abx, call Stat

Lactate > 2
SBP<90 or drop of >40mmHg below baseline or
MAP <65

SEPSIS ALERT TEAM MEMBERS

Primary RN and Charge Nurse
Phlebotomist
Pharmacist

MEWS Score for Sepsis

Score
0-1: Observe.
2: Observe & Monitor VS q2Hr and prn. Notify Charge RN
3: Observe & Monitor VS q1-2Hr and prn, Notify Charge
>3: Call Sepsis Alert. Start Sepsis Alert Protocol

Score	3	2	1	0	1	2	3
Temp		<=95.0	95.1-96.8	96.9-100.4	100.5-101.3	>101.4	
SBP	<90 or 40mmHg less	91-95	95-100				
HR	<50		50-59	60-89	90-110	111-129	130 or >
Resp	<9	9-11	12-14	15-20	21-24	25-30	>30
New O2				1-2 L/min	3-4 L/min	5-6 L/min	60% venti mask
LOC	somnolent		Responds to voice	Alert	Newly agitated	confused	
WBC			<4,000	4,000-12,000	>12,000		

Fluid Resuscitation in Congestive Heart Failure Patients with Severe Sepsis and Septic Shock at Community Memorial Hospital

Shadi Sharif, DO; Joseph Kang, DO; Hannah Robinson, DO; Lara Jenkins, RN
Community Memorial Health System

Abstract

Introduction

Prior studies have demonstrated early fluid resuscitation leads to decreased mortality outcomes in septic patients. However, often physicians are reluctant to pursue aggressive fluid resuscitation in patients with chronic fluid overload states due to fears of causing respiratory compromise. Currently, data is lacking on whether patients with chronic fluid overload states such as chronic heart failure (CHF), benefit from equivalent volumes of fluid resuscitation. This study seeks to investigate the effect of early fluid resuscitation in patients with chronic congestive heart failure who present with severe sepsis and septic shock.

Methods

This is a retrospective study conducted in Community Memorial Hospital (CMH) in Ventura, CA using data collected in the Emergency Department (ED) over the course of one year. Patients were selected for the study if they were given the diagnosis of severe sepsis or septic shock and CHF.

Results

Patients who received <30ml/kg of fluid had a mortality rate approximately three times that of those who received >30ml/kg of fluid.

Conclusion

Clinicians who hesitate to give the internationally recommended amount of fluid in severe sepsis and septic shock in patients with CHF can be more assured that these seemingly large amounts of fluids still decrease mortality. Moreover, further research in this area should be pursued.

Introduction

Sepsis is a relatively common disease process related to infection with variable degrees of severity associated with an overall high mortality. In fact, it is the most common cause of death in the hospitalized patient.[1]

Prior research has demonstrated that early fluid resuscitation has a great impact on survival. A landmark study by Rivers et al in 2001 created a bundle for treating severe sepsis and septic shock and was the first study to demonstrate importance of early fluid resuscitation in overall survival.[2] These treatment tenets have been supported on an international level via the Surviving Sepsis Campaign, which generated the first guidelines for treatment of sepsis syndromes, including recommendations on fluid resuscitation.[3]

Currently, there is scant literature regarding septic patients who have chronic fluid overload states such as CHF. Therefore, many practitioners are hesitant to initiate aggressive fluid administration of greater than 30 milliliters per kilogram (ml/kg) as advised by the Surviving Sepsis Campaign, particularly in patients with CHF due to fear of causing respiratory compromise.

We hypothesize that CHF patients with severe sepsis or septic shock still require equivalent amounts of fluid for prompt resuscitation.

Methods

This was a retrospective study of CHF patients who presented to the Emergency Room at Community Memorial Hospital between January 2014 and December 2014, who had a diagnosis of severe sepsis or septic shock. Data was collected by nurses and analyzed by Internal Medicine resident physicians. Data analysis was conducted using Excel and SPSS statistical analysis and data mining software. Cases were stratified according to amount of fluids (independent variable) patients received into two categories: Patients who received less than 30 milliliters of fluid per kilogram of body weight (ml / kg) versus those who received 30 ml / kg or more. Patients mortality rate served as the dependent variable in a standard 2 x 2 ANOVA.

Results

A total of 117 patients met eligibility criteria. There were no subsequent exclusions. There were 95 patients in the lower volume resuscitation group (< 30 ml / kg) of which 35 expired, resulting in a 37.89 % mortality rate. There were 22 patients in the higher volume resuscitation group (≥ 30 ml / kg) of which 3 expired, resulting in a 13.64 % mortality rate. ANOVA revealed the effect due to fluids to be statistically significant $F (1 , 113) = 5.7$, $p\ value = 0.019$. In other words, patients in the lower volume resuscitation group had a mortality rate approximately three times that of those in the higher volume resuscitation group (OR = 2.78).

	<30 ml/kg	≥30ml/kg
Expired	36	3
Total	95	22
% Mortality	37.89	13.64

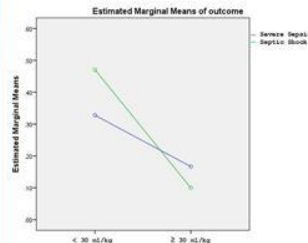Table 1: Mortality in CHF patients with severe sepsis and septic shock based on amount of fluid given.

Figure 1: Statistical analysis of data suggests mortality differences between the two groups are not affected by difference in sample size between the two groups.
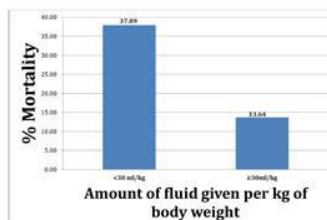

Figure 2: Mortality outcomes in CHF patients with severe sepsis and septic shock based on amount of fluid resuscitation.

Discussion

Prior studies have demonstrated the benefit of early fluid resuscitation in severe sepsis and septic shock. Current guidelines recommend at least 30 ml / kg of fluid to be given in the first 6 hours of presentation.[3] However, there are no direct studies addressing fluid resuscitation for severe sepsis and septic shock patients who have chronic fluid overload states, such as CHF. In practice, physicians are more hesitant to administer large quantities of fluid to patients that carry a diagnosis of chronic CHF due to concerns for respiratory compromise.

This study supports the hypothesis that chronic CHF patients with severe sepsis and septic shock have a lower mortality rate when early fluid resuscitation is performed according to suggested international guidelines of more than 30 ml / kg.[3] In fact, our study showed a three-fold reduction in mortality when CHF patients received 30 ml / kg or more of fluid compared to those who received less than 30 ml / kg of fluids (p value 0.019).

This study may serve to lessen clinicians' hesitations to provide the recommended fluid resuscitation in patients with chronic fluid overload states such as CHF.

Admittedly, there are many factors that may affect the mortality rates in the setting of septic shock and severe sepsis. Such factors include time lapse to antibiotics given, other co-morbidities, severity of sepsis spectrum, etc. However, this study only considered the effect of fluid resuscitation on mortality and assumed random occurrence of other factors in the two groups. Further studies are needed to investigate the effect of such variables on mortality rate in chronic congestive heart failure patients.

Another limitation of this study was the laborious manual data extraction method with potential for human error. Unfortunately, no systematic extraction tool exists for the EMR utilized by the emergency department at CMH. To avoid possible human errors some data points were collected two or three times to check for accuracy of information.

There was also concern that the data would be skewed by small numbers of patients in the higher amount of fluid category. However, an estimated marginal mean (EMM) of outcome analysis was performed. Such analysis is important when comparing means of unequal sample size as seen in this study population to ensure accuracy of results. EMM showed that the means were not proportionally different, which indicates the statistical analysis was not skewed by the small number of participants that received the higher amount of fluid.

Although our data cannot be generalized to other fluid overload states, including cirrhosis and end stage renal disease, it does support the notion that chronic CHF patients with severe sepsis and septic shock have a lower mortality rate when they received ≥ 30 ml / kg of fluid. Further studies are needed to study CHF and other fluid overload states, and to account for other variables affecting mortality rate.

References

1. Dombrovskiy VY. Et al. Rapid increase in hospitalization and mortality rates for severe sepsis in the United States: a trend analysis from 1993 to 2003. Crit Care Med. 2007 May; 35(5):1244-50.
2. Paul R.M. et al. (2015). Trial of early-goal directed therapy for septic shock. N Engl J Med 2014; 2015; 372:1301-1311.
3. Rivers E, Nguyen B, Havstad S, et al. Early goal-directed therapy in the treatment of severe sepsis and septic shock. N Engl J Med 2001;345:1368-1377.
4. International Guidelines for Management of Severe Sepsis and Septic Shock: 2012. Surviving Sepsis Campaign. Accessed at http://www.sccm.org/Documents/SSC-Guidelines.pdf.

STROKE AND SEPSIS TASK FORCE

(Shelina Patel, Isabel Jimenez, Cynthia Dukes, Crystal Cobos, Kelly Atwater, Amelia Owens, Helen Thompson, Mary Grace Ortiz, Erlinda Laska, Savannah Shiles, Jennifer Barger, Christina Westgate, Claudia Lis, Jaymelie Lening, Austin Felipe, Yvonne Lacoste. Not featured in the photo Stephanie Lara-Jenkins Stroke/Sepsis Coordinator)

THANK YOU

Any questions?

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2015 CMH SEPSIS BUNDLE DATA