

**5TH ANNUAL SOCIETY OF
CRITICAL CARE MEDICINE
TEXAS CHAPTER SYMPOSIUM**

“DISPARITIES IN CRITICAL CARE”

PATIENT OUTCOMES IN THE ICU

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OBJECTIVES

- Discuss short and long term outcomes of critically ill patients
- Identify disparities in outcomes of critically ill patients

DISCLOSURES

- I have no potential financial interests to report
- Every picture in this presentation has a written consent from the patient and/or family

SHORT AND LONG TERM OUTCOMES OF CRITICALLY ILL PATIENTS

DISPARITIES IN CRITICAL CARE

DELIRIUM

Salluh JIF et al. Outcome of delirium in critically ill patients: systematic review and meta-analysis. BMJ 2015;350:h2538

- Design: Systematic review and meta-analysis of published studies
- Results:
 - 42 studies included 16 595 critically ill patients
- Conclusions:
 - Nearly a third of patients admitted to ICU develop Delirium
 - These patients are at increased risk of
 - Dying during admission
 - Longer stays in hospital
 - Cognitive impairment after discharge.

ARDS

ARDS

Herridge, MS et al. **One-year Outcomes in Survivors of the Acute Respiratory Distress Syndrome**. N Engl J Med 2003 Feb 20;348(8):683-93

- 109 survivors of ARDS
- All patients reported poor function and attributed this to the loss of muscle bulk, proximal weakness, and fatigue.

Herridge MS et al. **Functional disability 5 years after acute respiratory distress syndrome**. N Engl J Med. 2011 Apr 7;364(14):1293-304

- At 5 years, the median 6-minute walk distance was 436 m (76% of predicted distance)
- Exercise limitation, physical and psychological sequelae, decreased physical quality of life, and increased costs and use of health care services are important legacies of severe lung injury.

EXTRA-CORPOREAL MEMBRANE OXYGENATION (ECMO)

Guttendorf J et al. Discharge outcome in adults treated with extracorporeal membrane oxygenation. Am J Crit Care. 2014 Sep;23(5):365-77

METHODS:

- Single-center, retrospective review of all adult patients treated with ECMO from 2005 through 2009.

RESULTS:

- 212 patients received ECMO for cardiac (n = 126) or respiratory (n = 86) failure.
- Mean age was 51 (SD, 14.5) years
- Support duration was 135 (SD, 149) hours
- Survival to discharge was 33% overall
 - 50% for respiratory
 - 21% for cardiac

Guttendorf J et al. Discharge outcome in adults treated with extracorporeal membrane oxygenation. Am J Crit Care. 2014 Sep;23(5):365-77

CONCLUSIONS:

- Patients with respiratory indications for ECMO experienced better survival than did cardiac patients
- Increasing age was associated with poor outcome
- Complications, regardless of ECMO indication, were common and associated with poor outcome

SEPTIC SHOCK

Poulsen JB, Moller K, Kelet H, Perner A. **Long-term physical outcome in patients with septic shock.**

Acta Anaesthesiol Scand 2009;53:724-730

- University of Copenhagen
- Physical outcome in survivors 1 year after septic shock
- 174 adult patients in a mixed ICU
- After 1 year:
 - Survivors were interviewed about physical function and socioeconomic status
 - 80 survivors
 - 2 still hospitalized

Poulsen JB, Moller K, Kelet H, Perner A. **Long-term physical outcome in patients with septic shock.**

Acta Anaesthesiol Scand 2009;53:724-730

- After 12 months, 2/3 of the patients had NOT regained their pre-admission physical status
- 81% of patients attributed this to loss of muscle mass

- Conclusion:

"Physical function is substantially reduced in survivors of septic shock one year after discharge."

PATIENT OUTCOMES AFTER ICU

PATIENT OUTCOMES AFTER ICU

- Survivors of critical illness experience a variety of impairments:
 - Physical
 - Cognitive
 - Mental

CritCareMed.2015; 43(6):1265-1275

IntensiveCareMed.2009;35(5):796-809



Outcome Measurement in ICU Survivorship Research From 1970 to 2013: A Scoping Review of 425 Publications*

Alison E. Turnbull, DVM, MPH, PhD¹⁻³; Anahita Rabiee, MD^{1,2}; Wesley E. Davis, BA^{1,2}; Mohamed Farhan Nasser, MBBS¹; Venkat Reddy Venna, MBBS¹; Rohini Lolitha, MBBS¹; Ramona O. Hopkins, PhD⁴⁻⁶; O. Joseph Bienvenu, MD, PhD^{1,7}; Karen A. Robinson, MSc, PhD^{3,8,9}; Dale M. Needham, FCPA, MD, PhD^{1,2,10}

- Published articles between 1970 and 2013 that included:
 - 20 or more survivors of critical illness
 - One or more post-discharge measure of a physical, cognitive, mental health, or quality of life outcome

- A total of 250 different measurement instruments were used in these 425 articles!

Crit Care Med 2016; 44:1267–1277

CONCLUSION

- The ability to compare results across studies remains impaired by the 250 different instruments used
- Development of a core outcome set of valid, reliable, and feasible measures is essential to improving the outcomes of critical illness survivors.

Crit Care Med 2016; 44:1267–1277

BURDEN OF PERSISTENT CRITICAL ILLNESS

Unroe M et al. **One-year trajectories of care and resource utilization for recipients of prolonged mechanical ventilation: a cohort study.**

Ann Intern Med. 2010 August 3; 153(3): 167–175

- **Objectives**—To describe one-year trajectories of care and resource utilization for prolonged mechanical ventilation patients
- **Design**—One-year prospective cohort study
- **Setting**—5 ICUs at Duke University Medical Center
- **Participants**—126 prolonged mechanical ventilation patients as well as their 126 surrogates and 54 ICU physicians were enrolled consecutively during one year

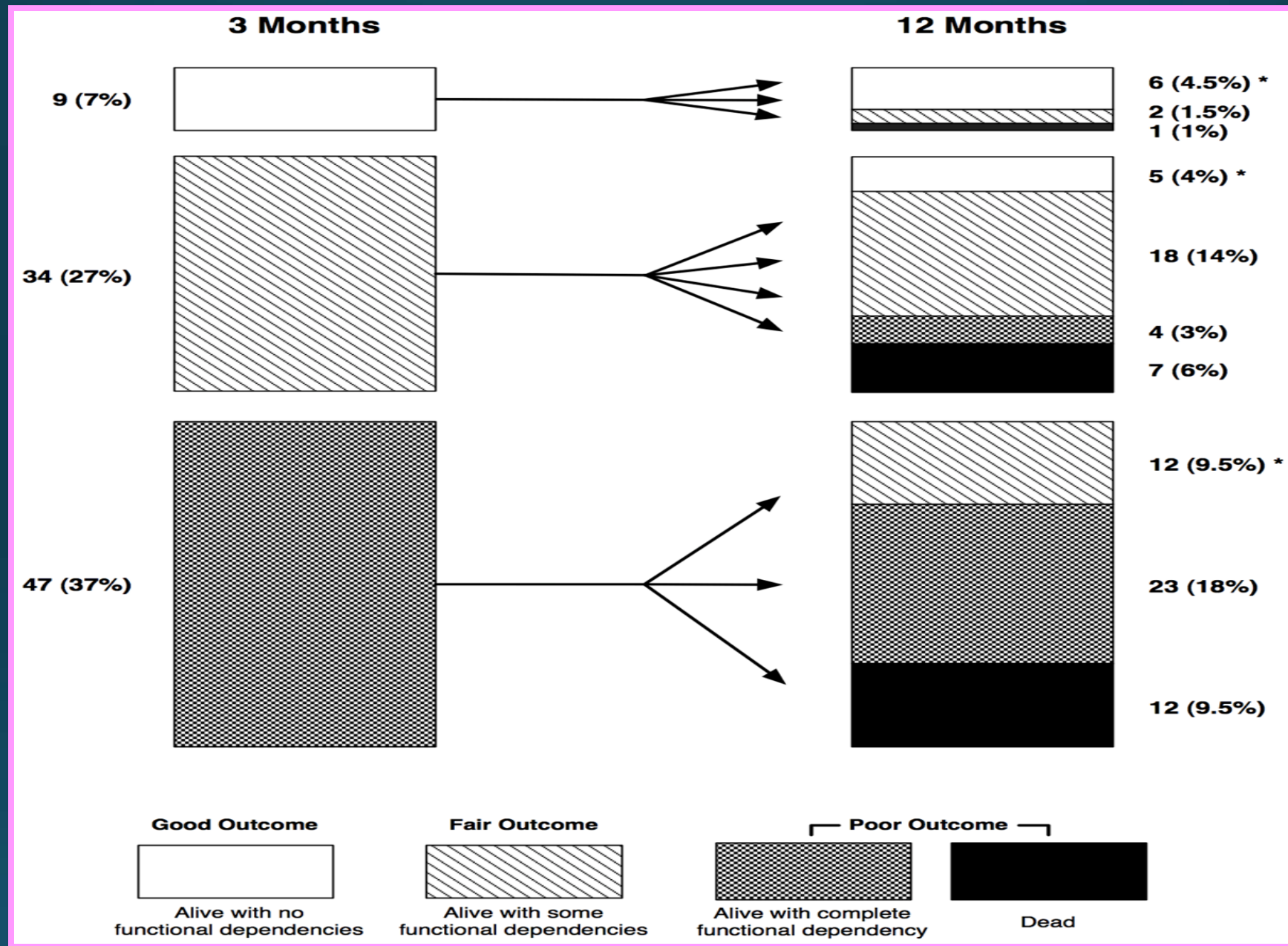


Figure 2. One-year patient trajectories by health outcomes groupings -*Ann Intern Med.* 2010 August 3; 153(3): 167–175

Unroe M et al. **One-year trajectories of care and resource utilization for recipients of prolonged mechanical ventilation: a cohort study.**

Ann Intern Med. 2010 August 3; 153(3): 167–175

- **Conclusions**—Prolonged mechanical ventilation patients experience multiple transitions of care, resulting in extraordinary health care costs and persistent, profound disability.

PATIENT OUTCOMES IN THE ICU

DISPARITIES IN CRITICAL CARE

Mundkur ML et al. Use of Electronic Health Record Data to Evaluate the Impact of Race on 30-Day Mortality in Patients Admitted to the Intensive Care Unit. J Racial Ethn Health Disparities. 2016 Jun 20. PubMed PMID: 27324822

METHODS:

- Retrospective cohort study - academic medical center in Boston, MA- 2001 and 2008.
- Adults admitted to a medical or surgical ICU were assessed for :
 - Primary outcome of 30-day mortality
 - Secondary outcomes of in-hospital mortality and hospital length-of-stay

RESULTS: The study cohort consisted of 14,684 adult ICU patients:

- White: 10,562
- Black: 1311
- Asian: 363
- Other: 868
- Unknown race: 1580

Mundkur ML et al. Use of Electronic Health Record Data to Evaluate the Impact of Race on 30-Day Mortality in Patients Admitted to the Intensive Care Unit. J Racial Ethn Health Disparities. 2016 Jun 20. PubMed PMID: 27324822

CONCLUSIONS:

- In a large, racially diverse cohort of general ICU patients, White patients experienced significantly higher mortality than non-White patients.

Shaw JJ, Santry HP. **Who Gets Early Tracheostomy?: Evidence of Unequal Treatment at 185 Academic Medical Centers.**

Chest. 2015 Nov;148(5):1242-50

METHODS:

- Retrospective prognostic study in adult patients receiving a tracheostomy after initial intubation.
- University HealthSystem Consortium (2007-2010)
- Time to tracheostomy : early (< 7 days) or late (> 10 days)

RESULTS: 49,191 patients underwent tracheostomy:

- 42% early (n = 21,029)
- 58% late (n = 28,162)

Shaw JJ, Santry HP. **Who Gets Early Tracheostomy?: Evidence of Unequal Treatment at 185 Academic Medical Centers.**
Chest. 2015 Nov;148(5):1242-50

CONCLUSIONS:

- Early tracheostomy was associated with increased survival.
- There were significant disparities in time to tracheostomy according to sex, race, and type of insurance:
 - Women, blacks, hispanics, and patients receiving Medicaid were less likely to receive an early tracheostomy.

Schneegelsberg A et al. **Impact of socioeconomic status on mortality and unplanned readmission in septic intensive care unit patients.**

Acta Anaesthesiol Scand. 2016 Apr;60(4):465-75

METHODS:

- Adult patients with severe sepsis or septic shock during 2008-2010
- Tertiary ICU -Aarhus University Hospital - Denmark
- Data from public registries on:
 - Educational level
 - Personal income
 - Cohabitation
 - Comorbidity
 - Readmissions
 - Mortality

Schnegelsberg A et al. **Impact of socioeconomic status on mortality and unplanned readmission in septic intensive care unit patients.**

Acta Anaesthesiol Scand. 2016 Apr;60(4):465-75

RESULTS:

- A total of 387 patients were included:
 - 111 (29%) died within 30 days after ICU admission
 - 55 (20%) died within 180 days after hospital discharge

CONCLUSIONS :

- Among septic ICU patients:
 - Low income was significantly associated with increased 30-day mortality
 - There was a trend towards earlier readmission among surviving patients with low educational level and personal income



ASSESS, PREVENT, AND MANAGE PAIN

Understand pain and find tools for its assessment, treatment and prevention.



BOTH SAT AND SBT

Both Spontaneous Awakening Trials and Spontaneous Breathing Trials



CHOICE OF ANALGESIA AND SEDATION

Understand the importance of defining the depth of sedation choosing the right medication.



DELIRIUM: ASSESS, PREVENT AND MANAGE

Understand delirium risk factors and find tools for its assessment, treatment and prevention.



EARLY MOBILITY AND EXERCISE

ICU early mobility involves more than changing the patient's position.



FAMILY ENGAGEMENT AND EMPOWERMENT

Involving the family in patient care can help recovery.

Kram SL et al. Implementation of the ABCDE Bundle to Improve Patient Outcomes in the Intensive Care Unit in a Rural Community Hospital. *Dimens Crit Care Nurs.* 2015 Sep-Oct;34(5):250-8

- ABCDE bundle was implemented in a six-bed general adult ICU of a rural community hospital
- Implementation of the bundle:
 - Decreased average patient hospital length of stay by 1.8 days
 - Reduced length of mechanical ventilation by an average of 1 day
 - Established a baseline delirium prevalence of 19% over a 3-month time period

LEARNING ASSESSMENT QUESTIONS

- Which of the following is not an impairment resulting from an admission to the ICU?
 - A. Physical impairment
 - B. Cognitive impairment
 - C. Visual impairment
 - D. Psychological impairment

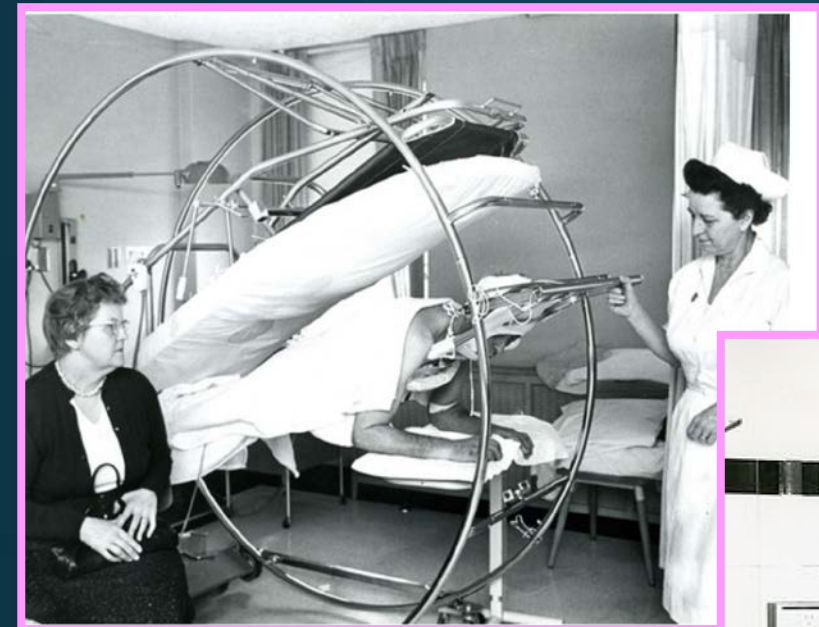
Answer “**C**” is the correct answer because it is well established that admission to ICU can cause physical , cognitive, and psychological impairments

- There are currently less than 10 tools available for post-ICU outcome measurement.
 - True
 - False

Answer **"FALSE"** is the correct answer because there are currently more than 250 tools available

WHAT IS THE FUTURE?

1970's



2016





TAKE HOME MESSAGE

How do we improve outcomes of patients in ICU?

PREVENTION is a much better option than any treatment currently available!



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THANK YOU

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