

Post-Cardiac Arrest Care Variations in Michigan Hospitals and Their Impact on Survival

Jaemin Song MS-3¹, David Berger MD^{1,2}, James Paxton MD³, Joe Miller MD⁴, Joshua Reynolds MD⁵, Nai Wei Chen PhD⁶, Robert Swor DO^{1,2}, CARES Surveillance Group



OAKLAND UNIVERSITY WILLIAM BEAUMONT

¹Oakland University William Beaumont School of Medicine, Rochester, MI

²William Beaumont Hospital – Department of Emergency Medicine, Royal Oak, MI

³Detroit Receiving Medical Center- Department of Emergency Medicine, Detroit, MI

⁴Henry Ford Hospital- Department of Emergency Medicine, Detroit MI

⁵Spectrum Health Hospital- Department of Emergency Medicine, Grand Rapids, MI

⁶Division of Bioinformatics, Beaumont Health

Introduction

- Most cardiac arrest patients who survive to hospital admission die in the hospital
- Most non survivors have care withdrawn
- Some hypothesize that early withdrawal of life sustaining therapy (WLST) adversely impacts survival.
- AHA Guidelines 2020:
- “ Accurate neurological prognostication in brain-injured cardiac arrest survivors is critically important to ensure that patients with significant potential for recovery are not destined for certain poor outcomes due to care withdrawal.”

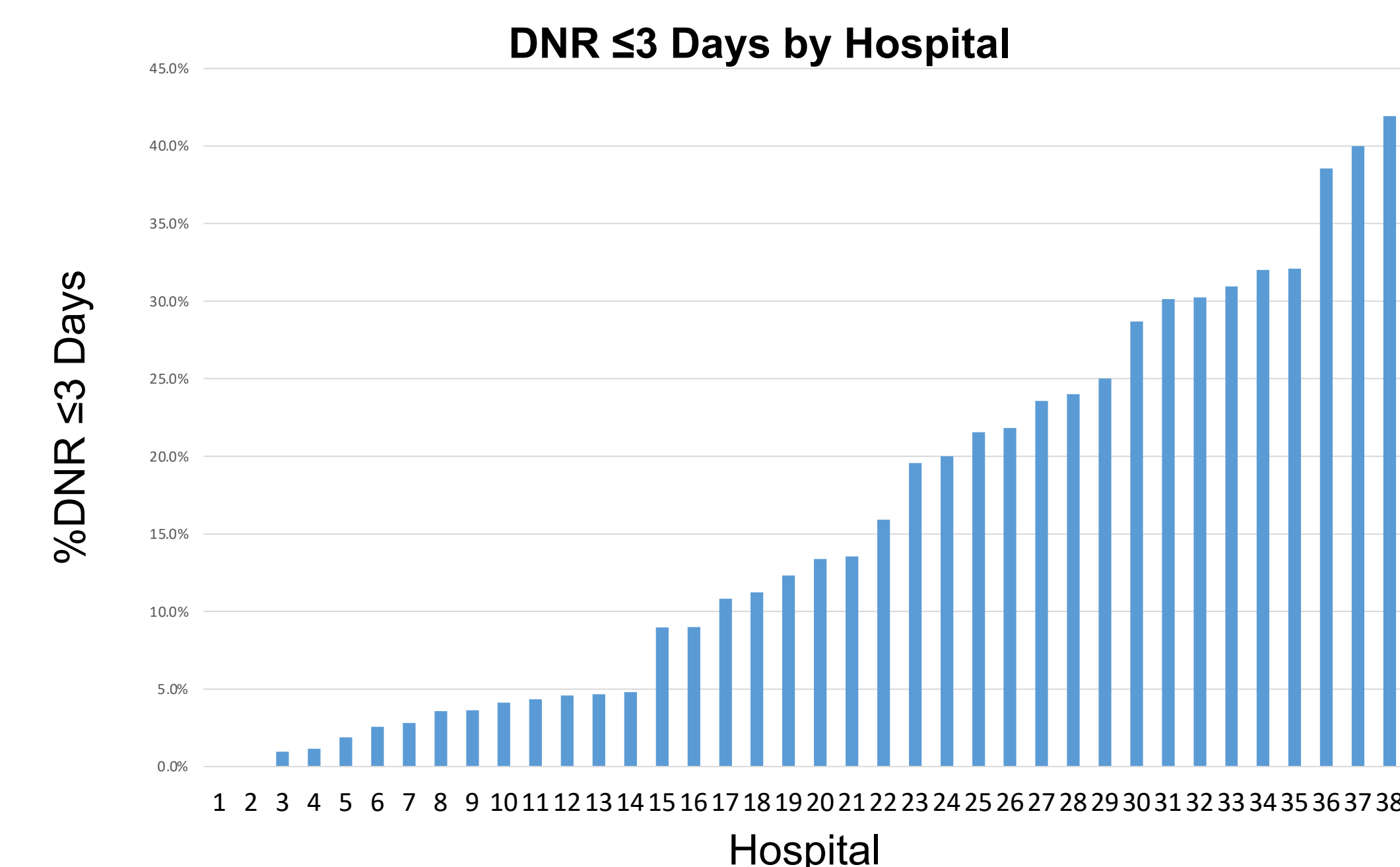
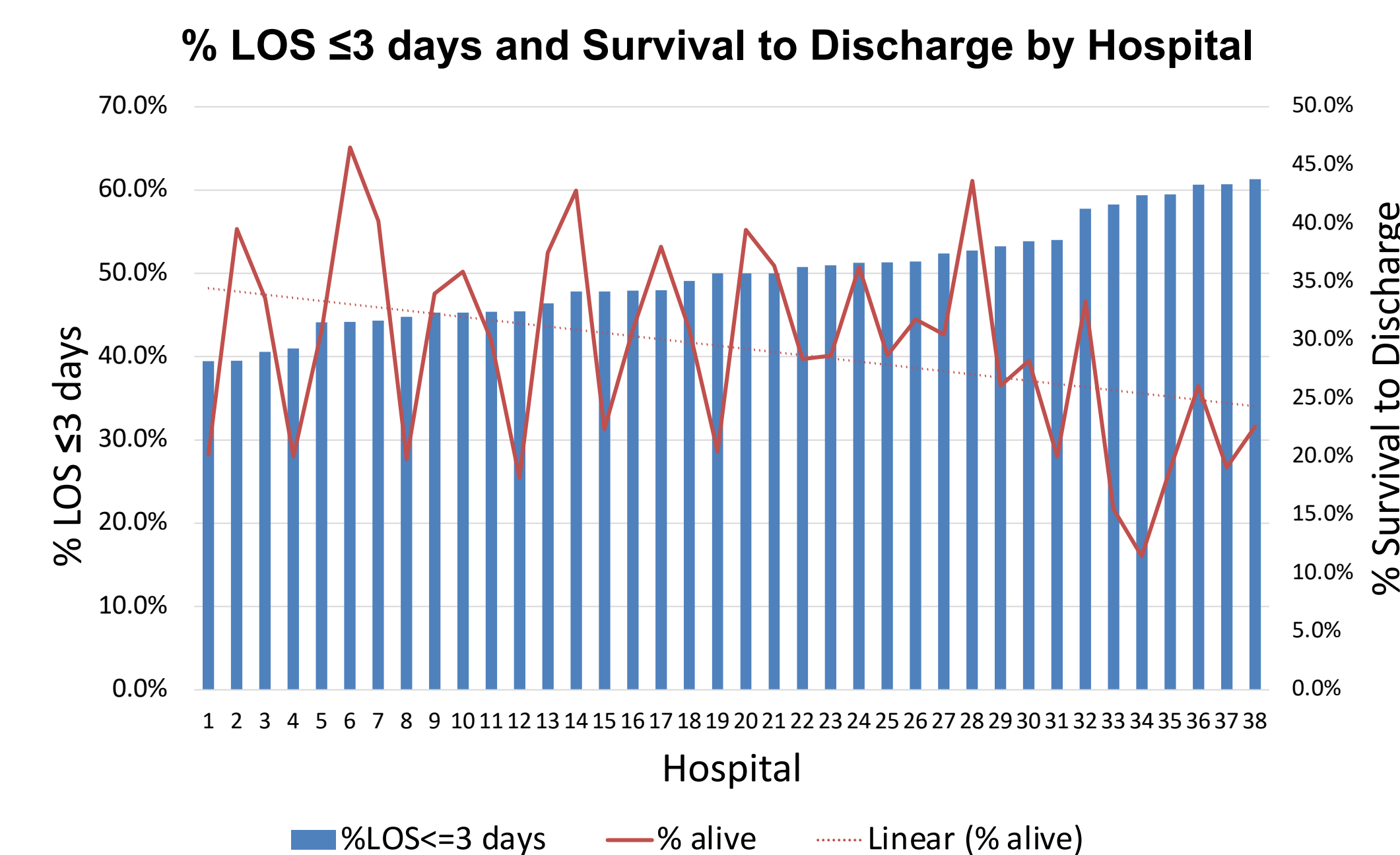
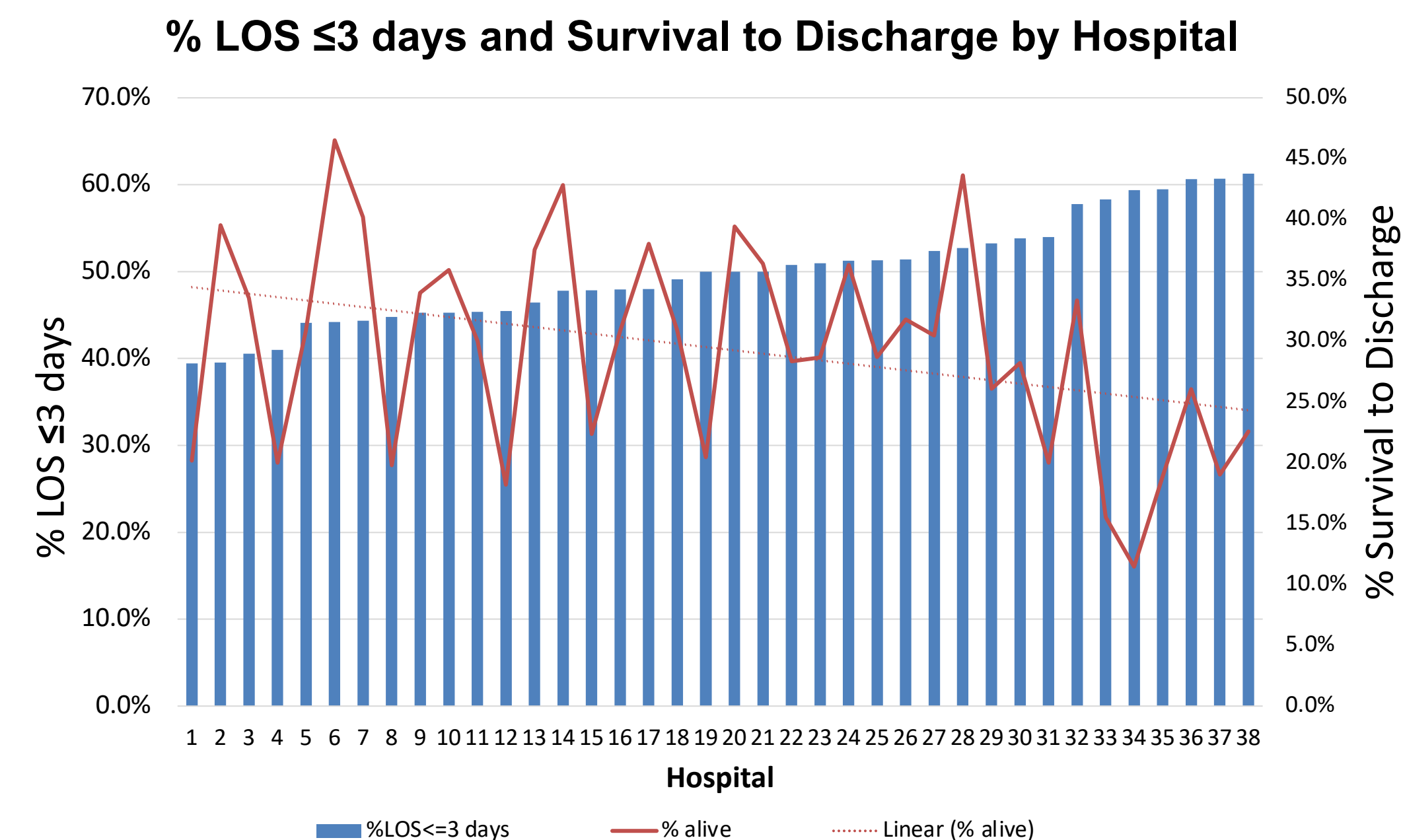
Aims and Objectives

- Characterize hospital length of stay (LOS) as a surrogate for early WLST of post arrest patients, its relationship to survival and variation by hospitals using a statewide registry called Cardiac Arrest Registry to Enhance Survival (CARES).

Methods

- Probabilistic linkage of out of hospital cardiac arrest records from 2014-2017 from the CARES registry and the Michigan Inpatient Database (MIDB)
- To assess variation in LOS (arrival to death/discharge), those with >30 subjects/hospital were included
- A “short LOS” was defined as ≤3 days.

Results



Conclusion

- Negative relationship between LOS and patient outcome in Michigan hospitals
- Significant variation in proportion of short LOS and early DNR orders in Michigan hospitals
- Potential that deaths may be prevented by increasing the time to WLST of post arrest patients

References

- 1.Elmer J, Torres C, Aufderheide TP, et al. Association of early withdrawal of life-sustaining therapy for perceived neurological prognosis with mortality after cardiac arrest. *Resuscitation*. Published online 2016. doi:10.1016/j.resuscitation.2016.01.016
- 2.Elmer J, Polderman KH. Emergency Neurological Life Support: Resuscitation Following Cardiac Arrest. *Neurocrit Care*. Published online 2017. doi:10.1007/s12028-017-0457-9
- 3.Zanyk-Mclean K, Sawyer KN, Paternoster R, Shievitz R, Devlin W, Swor R. Time to Awakening Is Often Delayed in Patients Who Receive Targeted Temperature Management after Cardiac Arrest. *Ther Hypothermia Temp Manag*. Published online 2017. doi:10.1089/ther.2016.0030
- 4.Elmer J, Callaway CW. The brain after cardiac arrest. *Semin Neurol*. Published online 2017. doi:10.1055/s-0036-1597833
- 5.May TL, Ruthazer R, Riker RR, et al. Early withdrawal of life support after resuscitation from cardiac arrest is common and may result in additional deaths. *Resuscitation*. Published online 2019. doi:10.1016/j.resuscitation.2019.02.031
- 6.Swor R, Qu L, Putman K, et al. Challenges of Using Probabilistic Linkage Methodology to Characterize Post-Cardiac Arrest Care in Michigan. *Prehospital Emerg Care*. 2018;22(2):208-213. doi:10.1080/10903127.2017.1362086
- 7.Fendler TJ, Spertus JA, Kennedy KF, Chan PS. Association between hospital rates of early Do-Not-Resuscitate orders and favorable neurological survival among survivors of in-hospital cardiac arrest. *Am Heart J*. Published online 2017. doi:10.1016/j.ahj.2017.05.017
- 8.Hirsch KG, Kudenchuk PJ, Morley PT, Neil BJO, Peberdy MA. *Circulation Part 3: Adult Basic and Advanced Life Support Resuscitation and Emergency Cardiovascular Care*. Vol 142.; 2020. doi:10.1161/CIR.0000000000000916

Acknowledgements

Robert Swor, DO
Nai Wei Chenn, PhD