Timing of Epinephrine Administration In Cardiac Arrest

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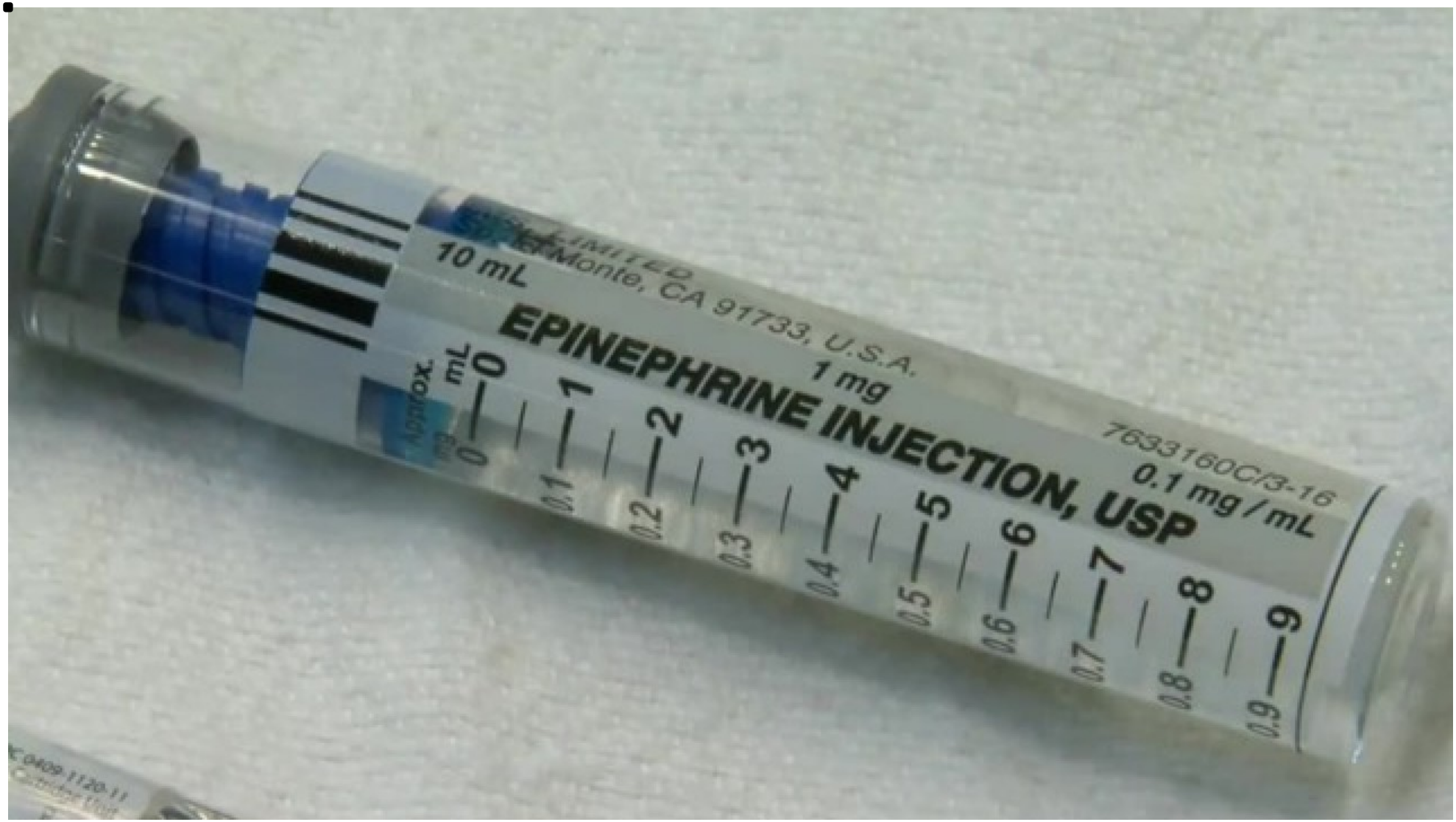
Drug Shortage



Known

Unknown

Epinephrine Physiology

Alpha adrenergic :

- Increases diastolic pressure
  - Increases coronary blood flow
- Causes platelet activation
- Impairs microvascular blood flow

Beta adrenergic:

- Increases cardiac contractility
- Increases myocardial O2 demand
- Increases risk of arrythmias

Epinephrine Literature

- Early epi is beneficial for ROSC
- Epi is not great for neuro outcomes
- High dose epi does not increase survival
- More epi associated with worse outcome

Unanswered questions

- How Often?
- What Rhythm?
- How Much?
- What Route?

Contents lists available at ScienceDirect

Resuscitation

journal homepage: www.elsevier.com/locate/resuscitation

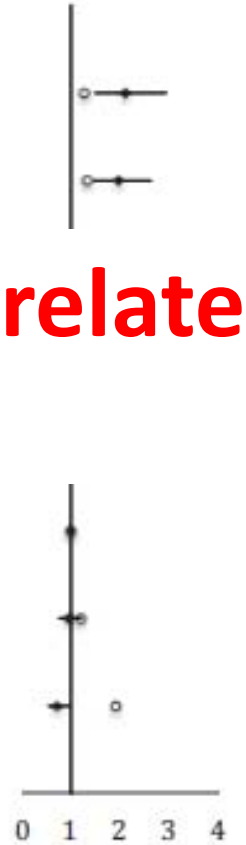
Clinical paper

Adrenaline (epinephrine) dosing period and survival after in-hospital cardiac arrest: A retrospective review of prospectively collected data☆

Sam A. Warren[a,b,c,*], Ella Huszti[a,b], Steven M. Bradley[b,f], Paul S. Chan[d,e], Chris L. Bryson[b,f], Annette L. Fitzpatrick[c,g,h], Graham Nichol[a,b,i], for the American Heart Association's Get With the Guidelines-Resuscitation (National Registry of CPR) Investigators[1]

- Retrospective review of 20,000 IHCA patients
- Time between first epi and endpoint of resuscitation
  Total doses of epi
- Longer dosing intervals improved survival
  - True for both shockable and non-shockable rhythms

Epinephrine average dosing period	No. of patients	Unadjusted survival to discharge No. (%)	Unadjusted Odds Ratio for Survival (95%CI)	Adjusted Odds Ratio for Survival (95%CI)
9-10 min/dose	796	87(10.9)	1.27 (0.98, 1.65)	2.10 (1.50, 2.93)
8-9 min/dose	1052	119(11.3)	1.33 (1.04, 1.69)	1.96 (1.47, 2.62)
4-5 min/dose	2665	233(8.7)	1(ref.)	1(ref.)
3-4 min/dose	1905	198(10.4)	1.20 (0.99, 1.45)	0.95 (0.76, 1.19)
1-3 min/dose	989	155(15.7)	1.91 (1.53, 2.38)	0.72 (0.55, 0.95)
Total	13,589	1,301(9.6)		



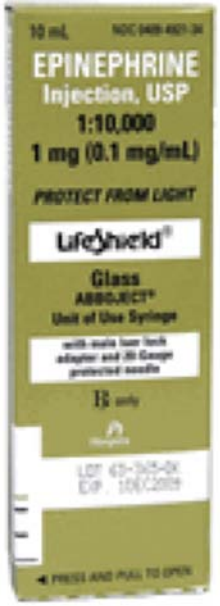
Adjusted Odds Ratio for Survival (95% CI)

Longer Epi Dosing Intervals Correlated With Increased Survival

Fig. 5. Survival to discharge by category of epinephrine average dosing period for in-hospital cardiac arrests of duration less than 20 min.

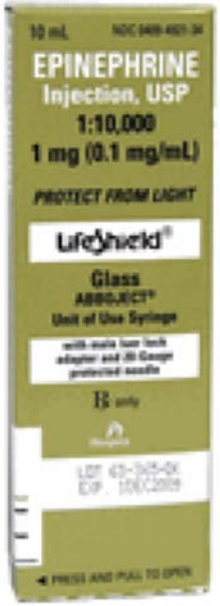

WHAT IF...?

January - June



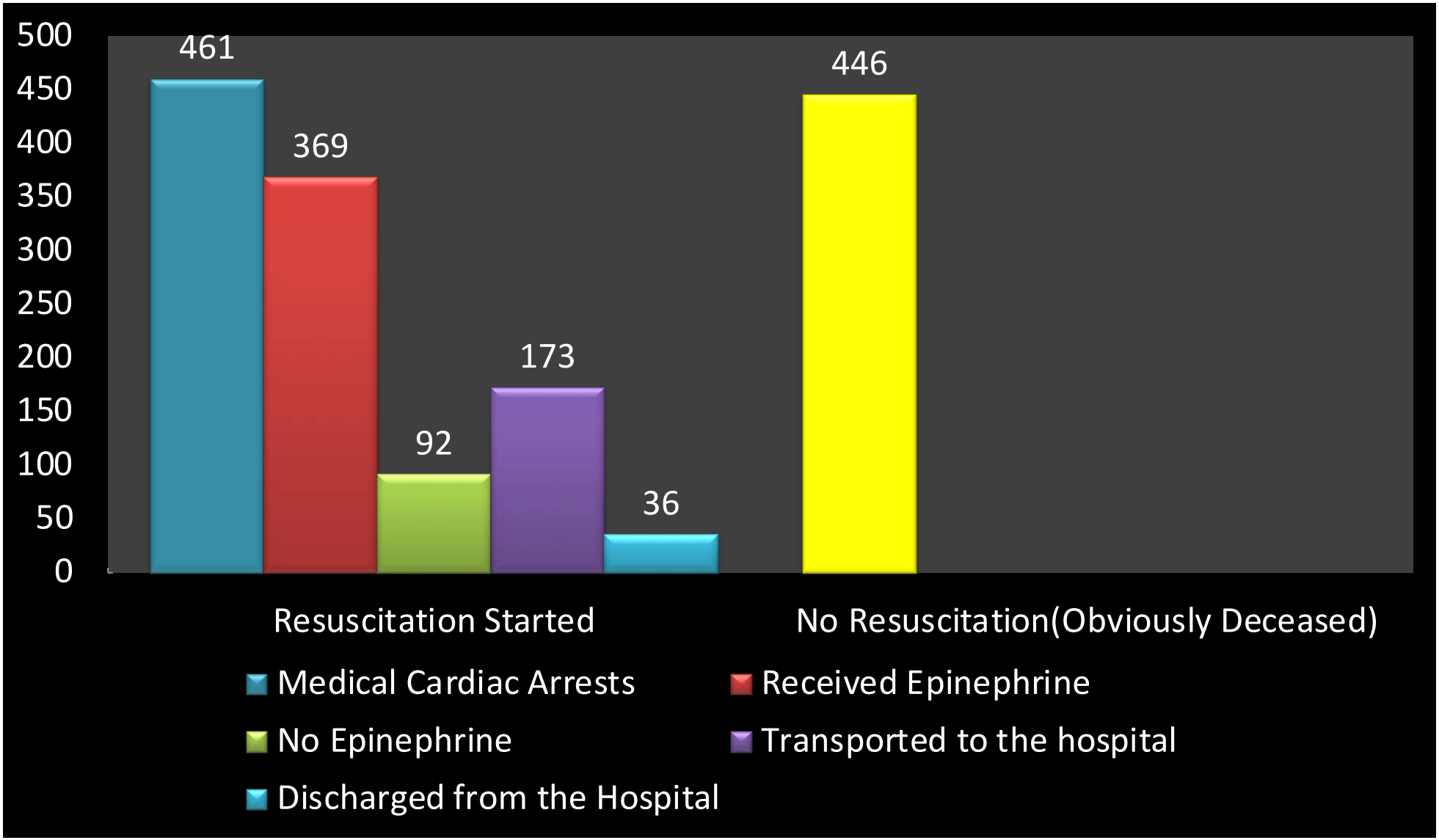
Epi Administered
Every 3-5 Minutes

June - December

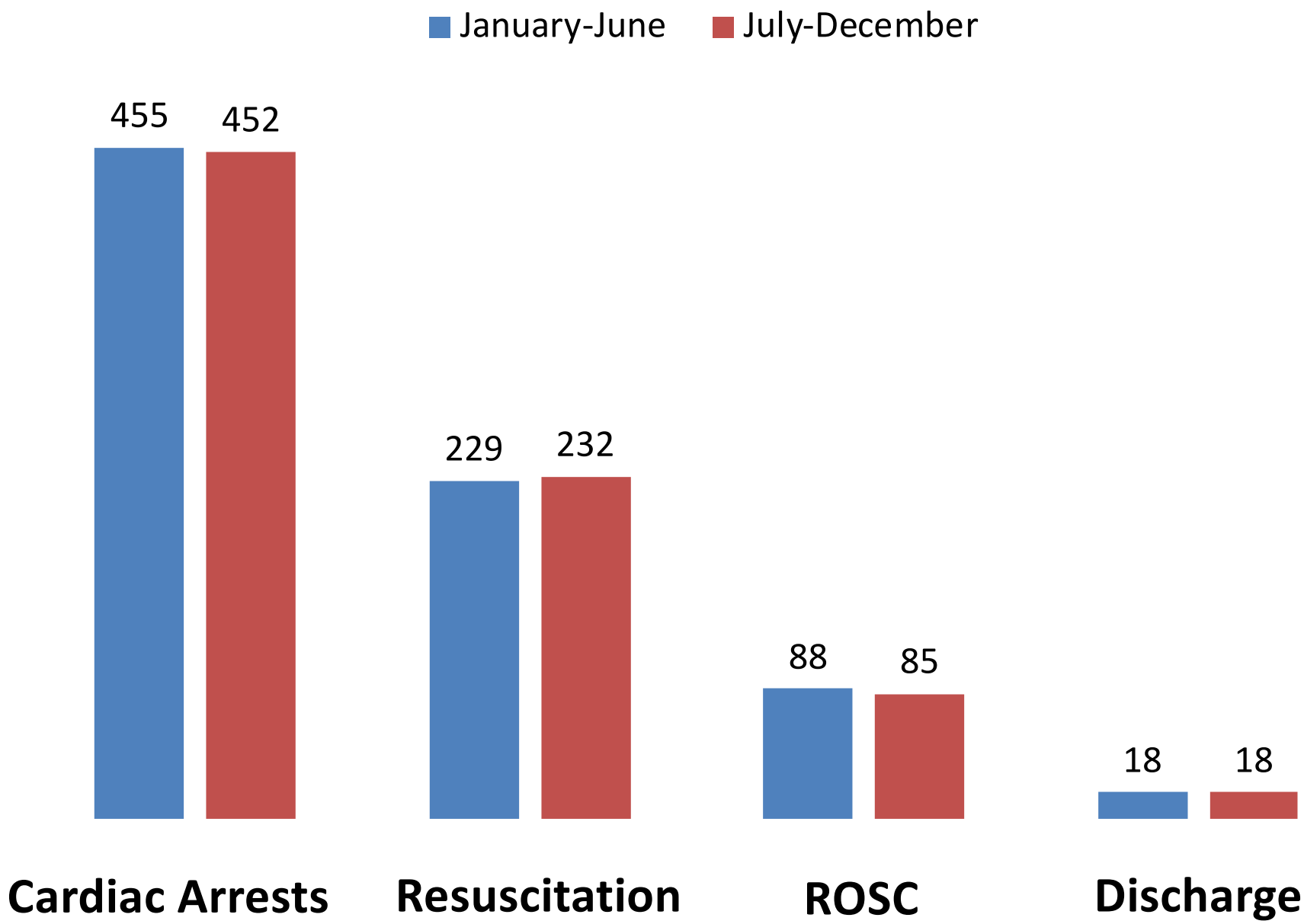


Epi Administered
Every 10 Minutes

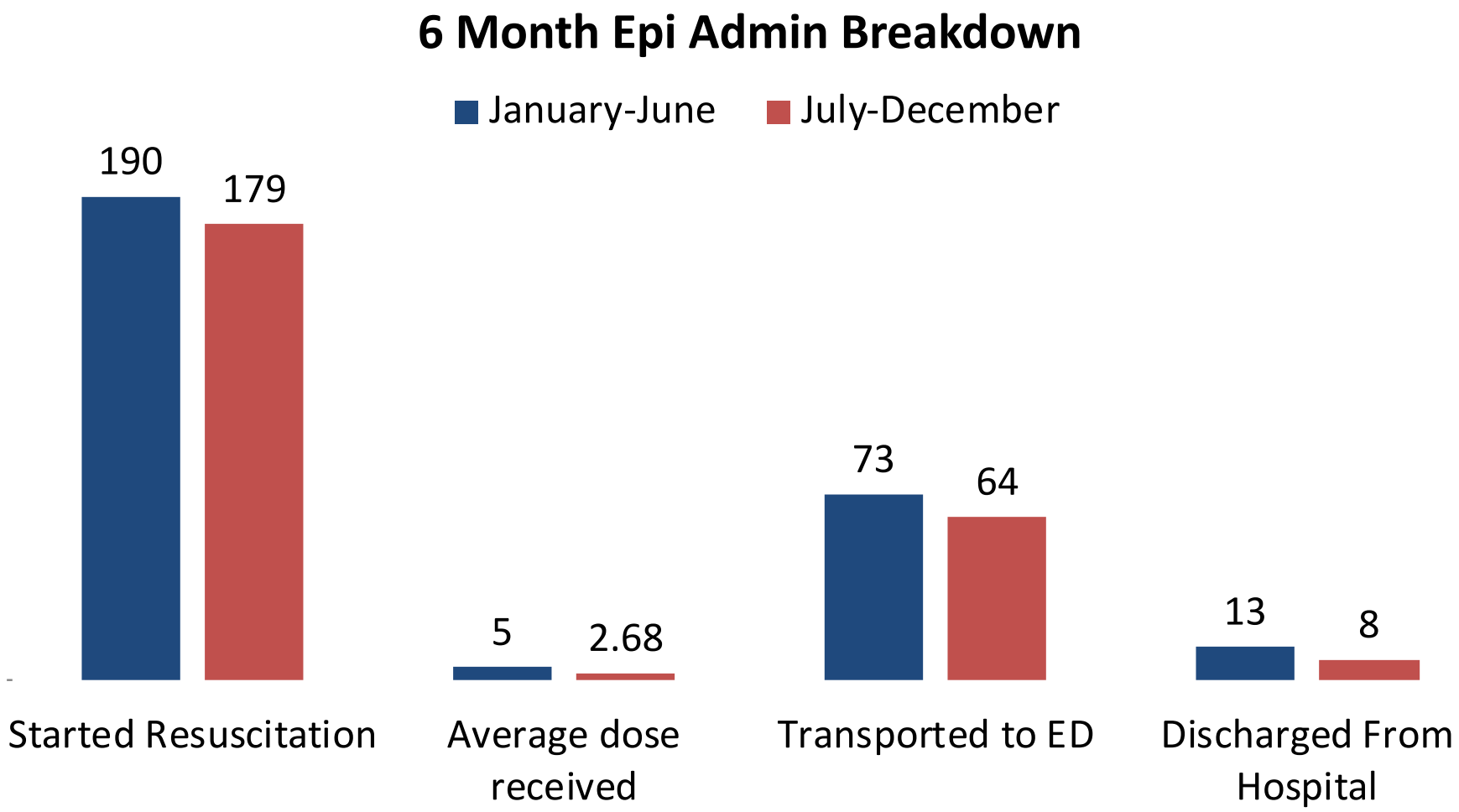
2017 Aggregate OOHCA Data



2017 Cardiac Arrest Data



3 Minute Vs. 10 Minute Epi

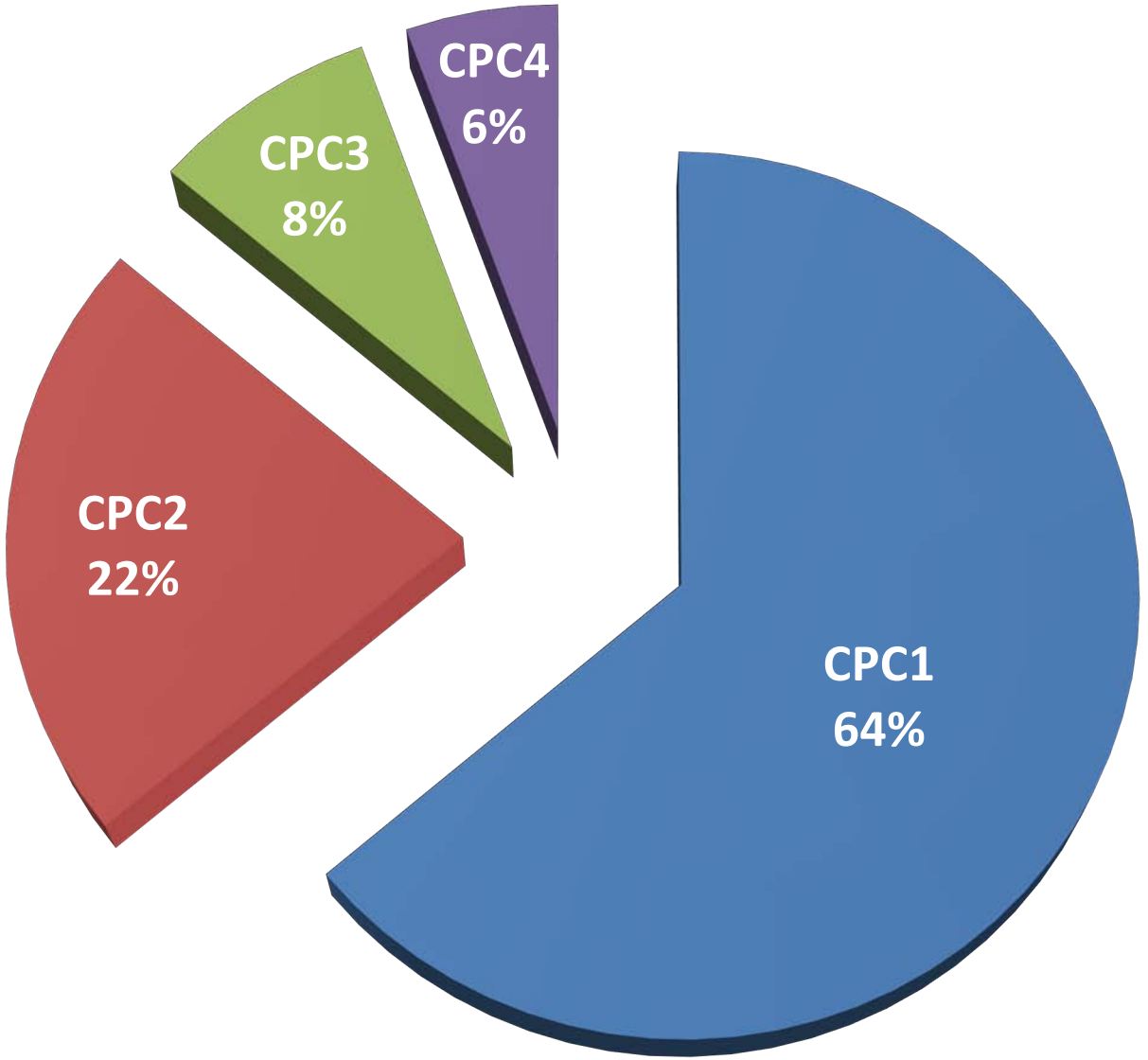


Are We Saving Lives, or Prolonging Death?

Cerebral Performance Category

- CPC 1 = Normal or only mild deficits
- CPC 2 = Moderate disability, independent ADLs
- CPC 3 = Severe disability, dependent on others
- CPC 4 = Vegetative state

CPC Scores For Discharged Patients



2017 CPC Scores of 1 or 2

EPI Every 3 minutes

January –June 2017

16

16/229 OHCA patients = 8%

16/88 ROSC patients = 18%

EPI Every 10 minutes

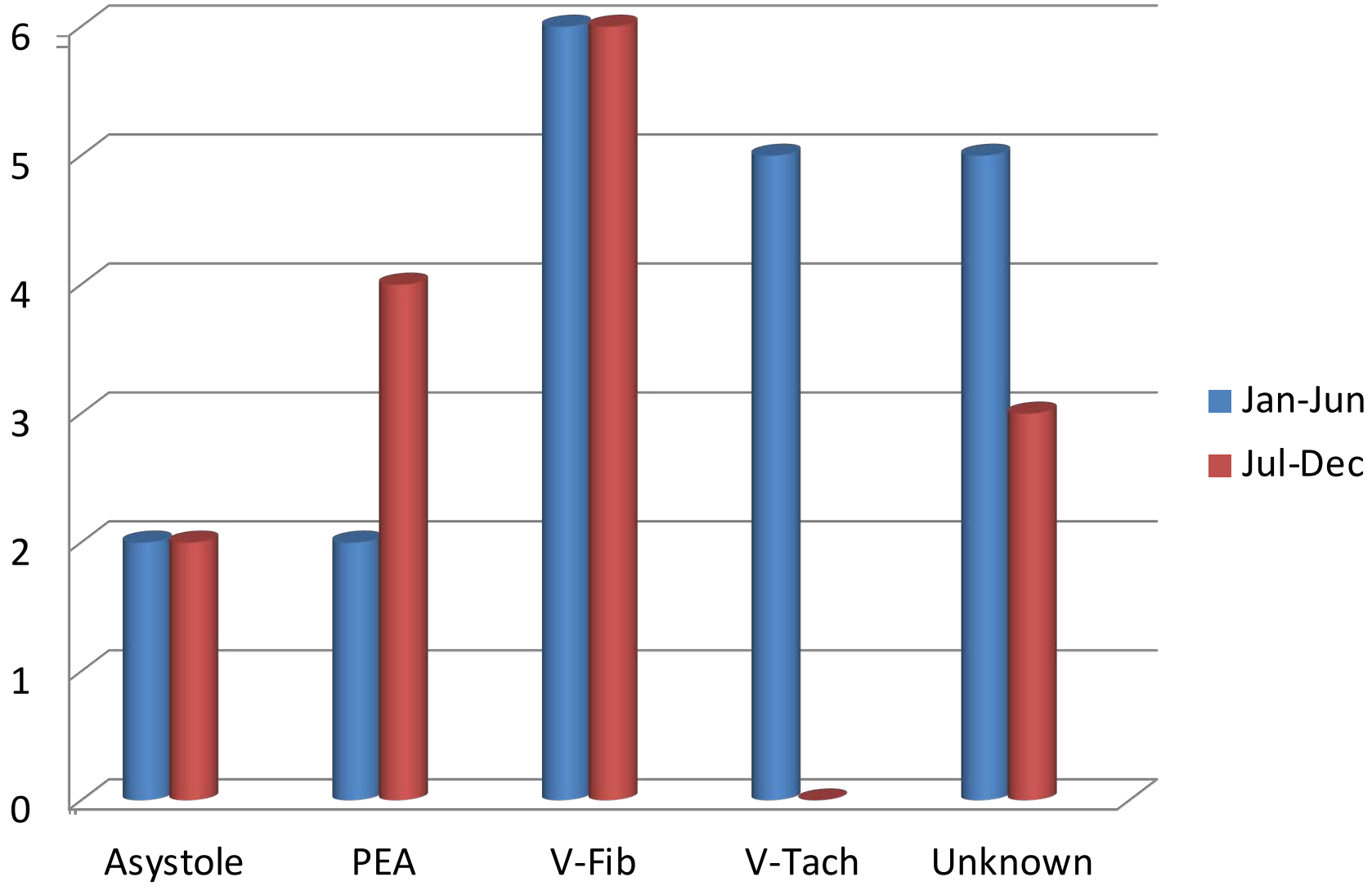
July – December 2017

15

15/232 OHCA patients = 6.5%

15/85 ROSC patients = 18%

Initial Rhythm vs. CPC 1&2



52% of our patients discharged with a CPC1 did not receive epinephrine at all

48% of patients discharged with a CPC1 received an average of 2 doses of epinephrine


SO
WHAT?

Conclusion

Giving epinephrine every 10 minutes did not cause harm

Data collected and analyzed by:

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- Lt. Chuck Dimas, AFR Paramedic
- Dorothy Habrat, MD
- Graham Smith, MD
- Andrew Harrell, MD
- Kimberly Pruett, MD