

ECMO Cannulation Outside of Normal Working Hours: Increased Complication Risk?

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BACKGROUND

- Extracorporeal membrane oxygenation (ECMO) support - veno-venous (VV) or veno-arterial (VA) - involves inserting large drainage and return cannulas into major veins and arteries in patients unstable from oxygenation, ventilation, or hemodynamic standpoint
- Many operative complications can arise, and due to patient instability, which may present at any time, as well as limitations of availability of operating rooms, surgeons and other personnel, many ECMO cannulations occur outside of normal working hours (1700-0730)
- At Community Regional Medical Center (CRMC), approximately 45% of ECMO cannulations occur outside of normal working hours (Figure A)
- Unclear from literature whether cannulations outside of normal working hours is a risk factor for increased complications

METHODS

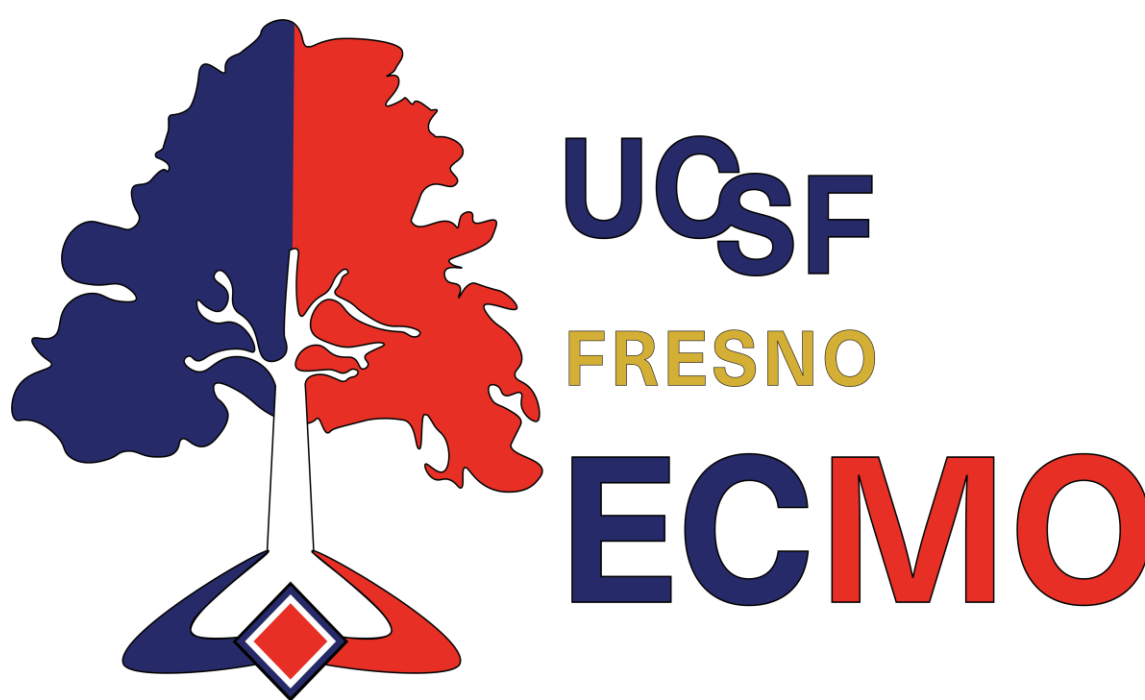
- Descriptive retrospective study of patients with VV or VA ECMO cannulation between 9/2016 and 12/2022 at CRMC
- The study sample was limited to peripheral cannulation performed at CRMC (n=116)
- Main outcomes assessed were frequency and association of cannulation complications during and outside normal working hours
- We used quantitative statistics including chi-square and fisher exact testing
- Pilot study to determine initial differences and to assess power for future studies that may assess this question

RESULTS/DISCUSSION

- No statistically significant increased risk in intra-operative complications when patients had VV or VA ECMO cannulation done outside normal working hours (Table 1).
- No statistically significant increased risk in post-operative complications when patients had VV or VA ECMO cannulation done outside normal working hours (Table 2).
- The 95% confidence intervals are very wide so there are wide possible differences in post-operative complications (Figure B)
- This study informs the number of patients needed to assess for clinically relevant differences in risk of complications when ECMO performed outside normal hours.
- It is reassuring that despite VV or VA ECMO cannulations occurring outside normal working hours, there is not an increased risk of intra-operative or post-operative complications.

ACKNOWLEDGEMENTS

- Yueqi Yan, Ph.D - UC Merced Biostats Consultant
- Kirsten Kangelaris, MD - UCSF Inquiry Advisor
- UCSF Fresno Critical Care Department



No statistically significant increased risk of intra- and post-operative complications when VV and VA ECMO are performed outside normal working hours at Community Regional Medical Center

RESULTS

Table 1: Intra-operative Complications

Intra-operative Complications (VV + VA ECMO)	Normal Working Hours (n=64)	Outside Normal Working Hours (n=52)	p-value	Odds Ratio (Confidence Interval)
Dysrhythmia	1 (1.6%)	3 (5.8%)	0.32	0.26 (0.03-2.57)
Cardiac Arrest	1 (1.6%)	0 (0%)	1.00	N/A
Vascular Injury	0 (0%)	2 (3.9%)	0.20	N/A
Hemodynamic Instability	3 (4.7%)	2 (3.9%)	1.00	1.23 (0.20-7.65)
Bleeding	25 (39.1%)	15 (28.8%)	0.25	1.58 (0.72-3.46)

Table 2: Post-operative Complications

Post-operative Complications (VV + VA ECMO)	Normal Working Hours (n=64)	Outside Normal Working Hours (n=52)	p-value	Odds Ratio (Confidence Interval)
Inpatient Mortality	27 (42.2%)	23 (44.2%)	0.83	0.92 (0.44-1.93)
DIC	2 (3.1%)	1 (1.9%)	1.00	1.65 (0.15-18.67)
Bleeding	20 (31.3%)	16 (30.8%)	0.96	1.02 (0.46-2.26)
Fungemia	4 (6.3%)	2 (3.9%)	0.69	1.67 (0.29-9.48)
Bacteremia	2 (3.1%)	3 (5.8%)	0.66	0.53 (0.09-3.28)
Hemodialysis	18 (28.1%)	18 (34.6%)	0.45	0.74 (0.34-1.63)
Cerebral Hemorrhage	6 (9.4%)	6 (11.5%)	0.70	0.79 (0.24-2.62)

