



## Heart Failure

### COMPLICATIONS OF EXTRACORPOREAL MEMBRANE OXYGENATION FOR TREATMENT OF CARDIOGENIC SHOCK AND CARDIAC ARREST: A WEIGHTED META-ANALYSIS

Poster Contributions

Poster Sessions, Expo North

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**Background:** Venous-arterial extracorporeal membrane oxygenation (ECMO) has been used successfully for treatment of cardiogenic shock or cardiac arrest. The exact complication rate is not well understood, in part due to small study sizes. In the absence of large clinical trials, performance of pooled analysis represents the best method for ascertaining complication rates for ECMO.

**Methods:** A systematic MEDLINE search was conducted on ECMO for treatment of cardiac shock or cardiac arrest, updated up to July 2012. Studies with N>30 published in the year 2000 or later, which reported complication rates for ECMO were included. Specific complications analyzed included lower extremity ischemia, fasciotomy, amputation, bleed, stroke, neurologic sequelae, acute kidney injury, systemic infection, and re-thoracotomy for bleeding or tamponade. For studies that included overlapping patients, the largest study was included and the others excluded. Cochran's Q and I<sup>2</sup> were calculated. A conservative random effects model was chosen for all analyses.

**Results:** 26 studies were included in the analyses encompassing 277-1,320 patients depending on the specific complication analyzed. Results are summarized in Table 1.

**Conclusions:** While ECMO could improve survival of patients with advanced heart disease, there is significant associated morbidity with performance of this intervention. These findings could be incorporated in the risk benefit analysis when initiation of ECMO for cardiogenic shock is being considered.

Table 1. Complications of ECMO

	Lower Extremity Ischemia	Fasciotomy	Lower Extremity Amputation	Bleed	Stroke	Neurologic	Acute Kidney Insufficiency	Requiring Renal Replacement Therapy	Systemic Infection	Re-thoracotomy for bleed or tamponade
Reported Rate Min, Max, %	3, 33	4, 21	1, 13	9, 64	1, 13	6, 50	30, 87	14, 87	15, 90	8, 87
Cumulative Rate	106/804	37/454	11/277	167/583	63/962	181/1022	158/343	707/1370	279/740	398/820
Number of Studies	13	7	5	8	6	9	6	13	9	6
Cochran's Q	38.1	7.88	4.90	62.6	20.8	50.0	24.3	92.4	79.8	132
P Value Heterogeneity	<0.01	Not Significant	Not Significant	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
I <sup>2</sup> , %	68.5	23.9	18.3	88.8	76.0	83.3	79.4	87.0	90.0	96.2
Pooled Estimate Rate, %	11.7	7.03	3.12	28.8	6.26	15.2	46.0	42.9	34.9	39.8
95% Confidence Interval, %	7.63-15.8	4.00-10.1	0.39-5.86	17.4-40.3	2.97-9.56	9.12-21.4	30.7-61.3	32.5-53.4	22.0-47.8	17.8-61.8