

Destined to Have Extraordinary Extracorporeal Destinations:

*Who's EMS Transporting to
ECMO Centers, and
What Constitutes those
Receiving Facilities ?*

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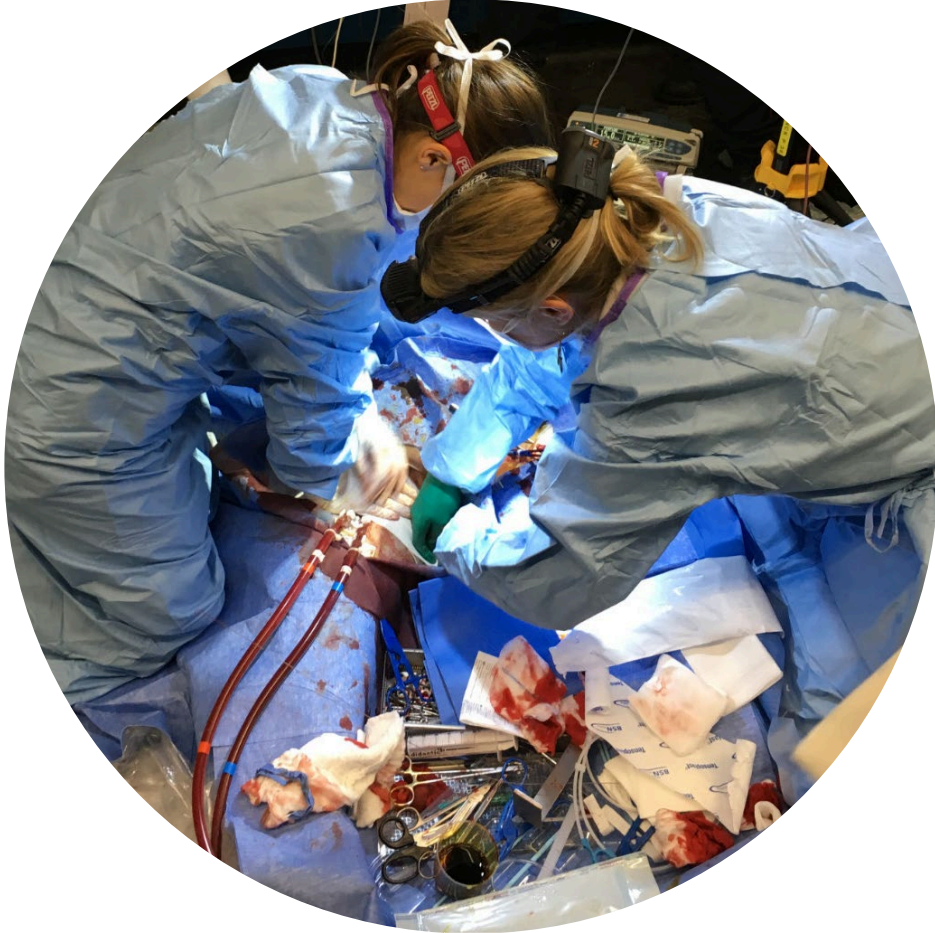


OHCA: It's our specialty, but can we do better?

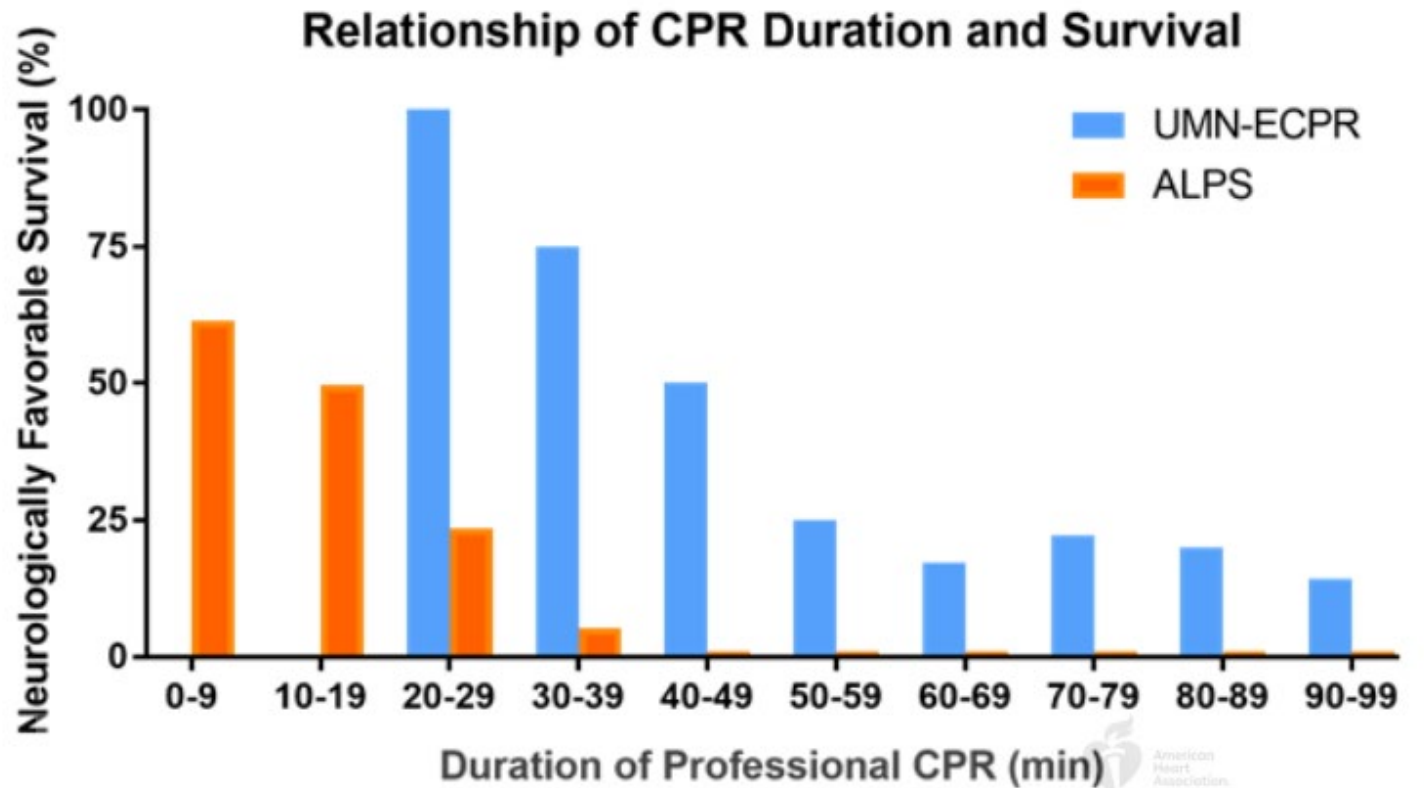




System of Care: EMS, ED, ICU, cardiologists & cardiothoracic surgeons



If you are put on ECPR within 30 min at UMN, they have a 100% neuro intact survivorship



Patients at Risk

Time (min)	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	Total
UMN-ECPR	0	0	8	12	20	36	35	27	15	7	160
ALPS	70	151	102	95	99	69	29	11	3	7	636



San Diego – 3.2 million people



STEMI

Assuming every STEMI gets emergent cath
4.9% improved mortality
 $50 \text{ STEMIs}/100,000 = 1660 \text{ STEMIs annually in SD}$

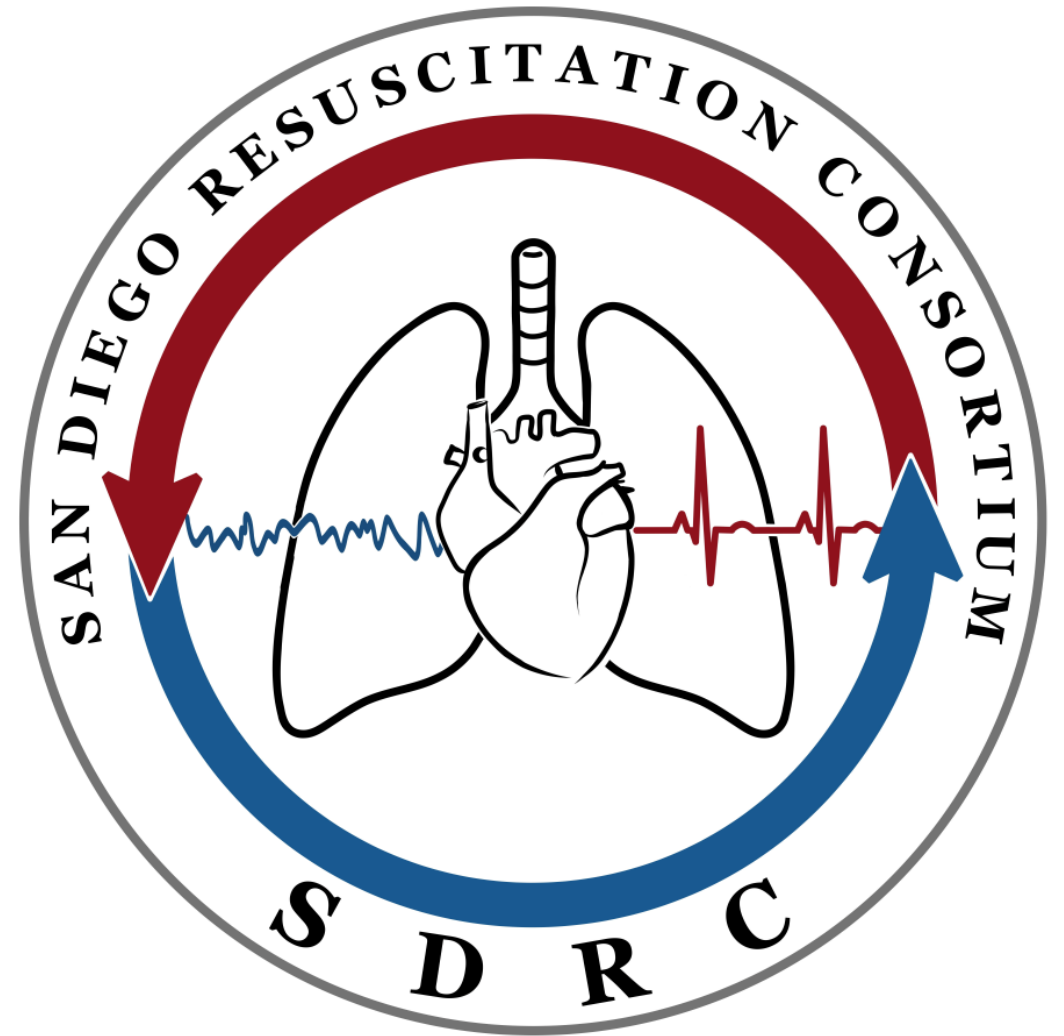
STEMI Cath lab program saves 81 patients annually

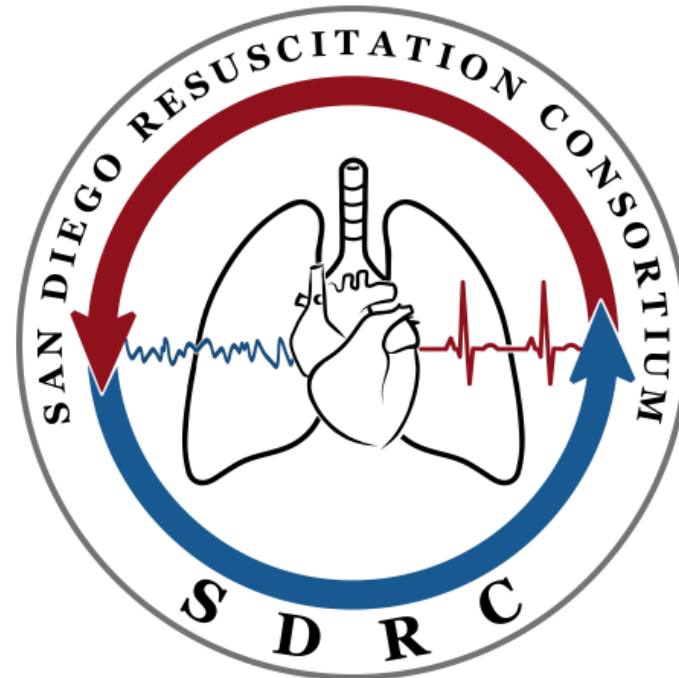
ECPR

Assuming every Utstein OHCA got ECPR
43% absolute mortality benefit
179 patients per year


ECPR would save 77 patients annually

ECPR &
San Diego
Resuscitation
Consortium

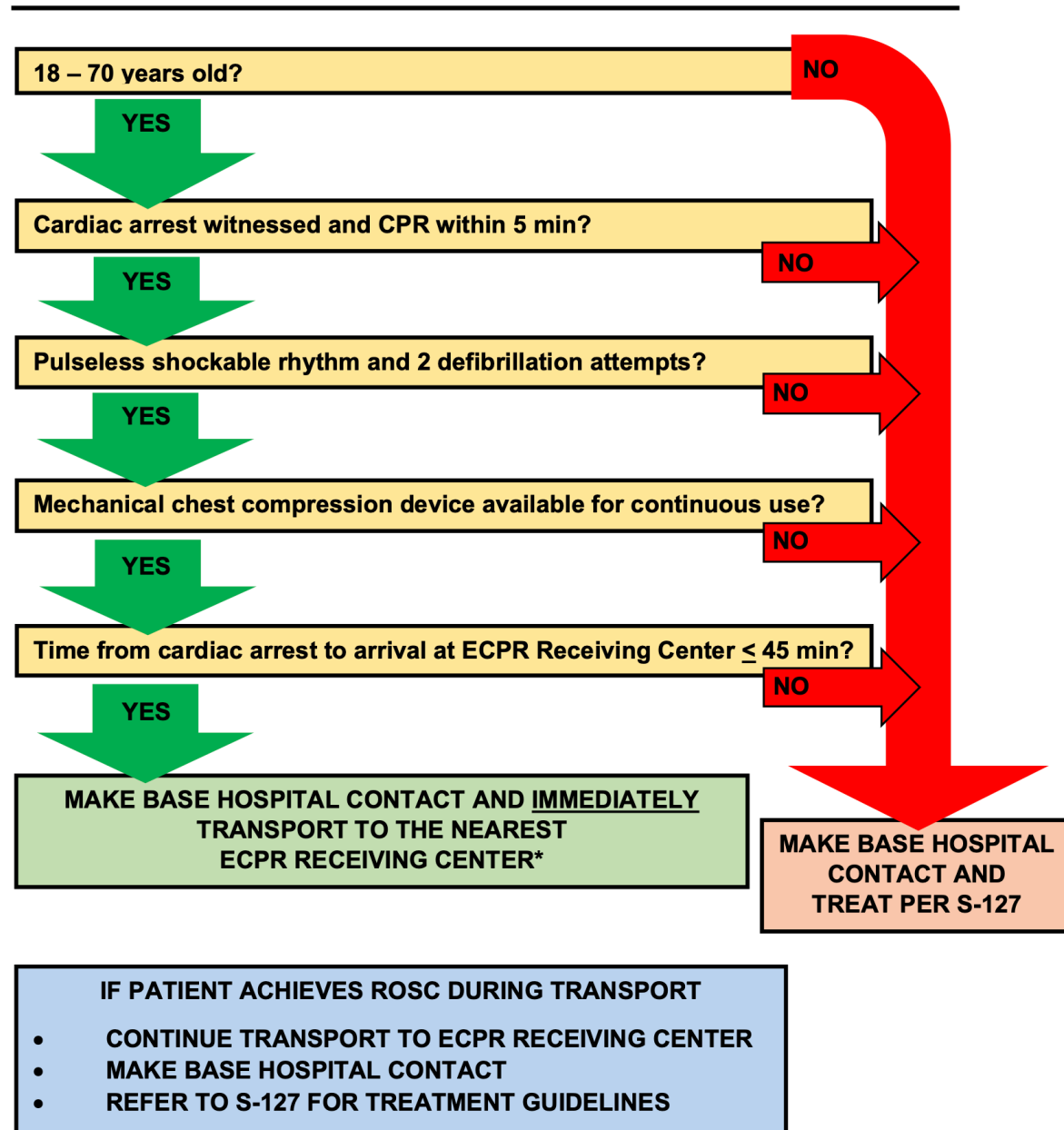




Stroke, STEMI, Trauma, Peds....
And now ECPR...

 <p>County of San Diego EMS A Division of San Diego County Fire</p>	SYSTEMS		S-030
	EXTRACORPOREAL CARDIOPULMONARY RESUSCITATION (ECPR) CRITICAL CARE SYSTEM DESIGNATION		
	Date: 7/1/2023		Page 1 of 3

EXTRACORPOREAL CARDIOPULMONARY RESUSCITATION (ECPR) DECISION ALGORITHM



*Bypass non-ECPR STEMI Receiving Centers



The Los Angeles Experience...

Los Angeles County Refractory Ventricular Fibrillation/Ventricular Tachycardia ECMO Pilot Program Field Protocol

INITIATE TREATMENT OF NON-TRAUMATIC CARDIAC ARREST PER TP 1210

Potential ECMO Candidate?

- VF or VT cardiac arrest
- Age ≥ 15 and ≤ 75
- Within 30 minutes of ECMO Center
- **NO** obvious contraindication to study (Noncardiac etiology, DNR, terminal illness, chronic nursing home resident/dependent due to cognitive impairment, pregnancy, cannot apply LUCAS)

NO

Proceed with usual treatment per TP 1210*

Yes to ALL

DEFIBRILLATION #1

- Continuous chest compressions (limit interruptions ≤ 5 sec)
- Apply LUCAS device as soon as available
- Establish IV/IO access

Persistent VF/VT at 2 minutes?

NO

Proceed with usual treatment per TP 1210*

Yes

DEFIBRILLATION #2

- Maintain continuous chest compressions (manual or LUCAS as soon as available)
- Administer epinephrine 1mg IV/IO q 5 minutes (3 doses total)
- ****Begin packaging and preparing patient for transport****
- Contact ECMO center Base Station to notify of potential patient
- Insert advanced airway and apply ITD (if not done with BMV)

Persistent VF/VT at additional 2 minutes?

NO

Proceed with usual treatment per TP 1210*

Yes

DEFIBRILLATION #3

- Confirm destination with ECMO Base - meets ALL indications? Route on judgment?
- Immediately load patient and initiate transport with ongoing resuscitation (ensure LUCAS applied prior to transport) **GOAL scene time 10-15 minutes maximum**
- Administer Amiodarone 300mg IV/IO

*ITD/LUCAS should be also used by participating units whenever available for all OHCA patients.

Different approaches to EMS/ED e-CPR

In the FIELD....

AMBULANCE MODEL	INTERCEPT MODEL
All vehicles have MCDs	Geographically dispersed EMS Capts have MCDs
Limited area of coverage	Larger area of coverage
+ MCDs arrive/placed quickly	+ Broader access
- Less access	- Additional dispatch event, delay in MCD arrival

In the EMERGENCY DEPARTMENT....

CANNULATION IN ED (CT Surgery teams)	CANNULATION IN CATH LAB (Interv. Cardiology)
+ Decreased elapsed time to ECMO	+ Decreased time in ED
- Stay in ED booth longer, potentially pronounced	+ More likely to ultimately receive PCI
- Delay in PCI	- 10 min ED curtain tax
	- Delay in cannulation

Implementation of a regional extracorporeal membrane oxygenation program for refractory ventricular fibrillation out-of-hospital cardiac arrest

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Table 1 – Preliminary Patient Outcomes.

	All (N = 35)		eCPR (N = 11)		No eCPR (N = 24)	
	N	%	N	%	N	%
Survival to Cath Lab	23	65.7	11	100	12	50.0
Survival to ICU Admission	16	45.7	9	81.8	7	29.2
Survival to Discharge	5	14.3	3	27.3	2	8.3
CPC 1 at Discharge*	4	80.0	3	100	1	50.0
Time on ECMO (days), mean/std	–	–	2.4	2.2	–	–
Hospital length of stay (days), mean/std	3.5	7.6	5.3	8.5	2.7	7.2

CPC = Cerebral Performance Category; mRS = Modified Rankin Scale; ICU = Intensive Care Unit; ECMO = Extracorporeal Membrane Oxygenation.

* Percent of survivors.



ECPR ... The
Future of
OHCA? We
think so

Ideal population: Utstein patients

This is a system of care

Time to cannulation matters!

Neuro intact survival, here we
come

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