

UTILIZING CEREBRAL OXIMETRY FOR NEUROPROGNOSTICATION POST-CARDIAC ARREST

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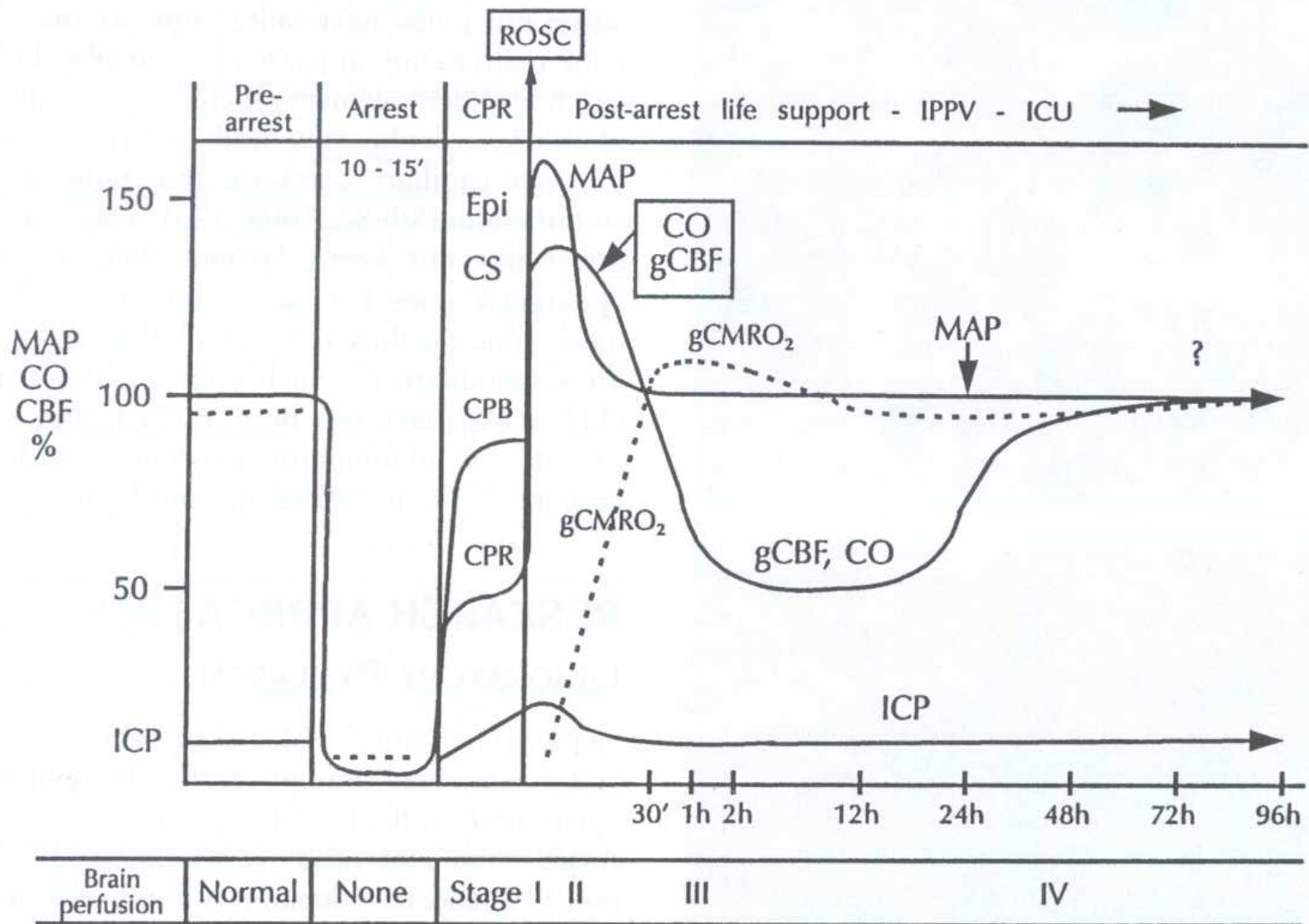


CURRENT VALIDATED PREDICTORS OF GOOD NEUROLOGIC OUTCOME FROM CARDIAC ARREST

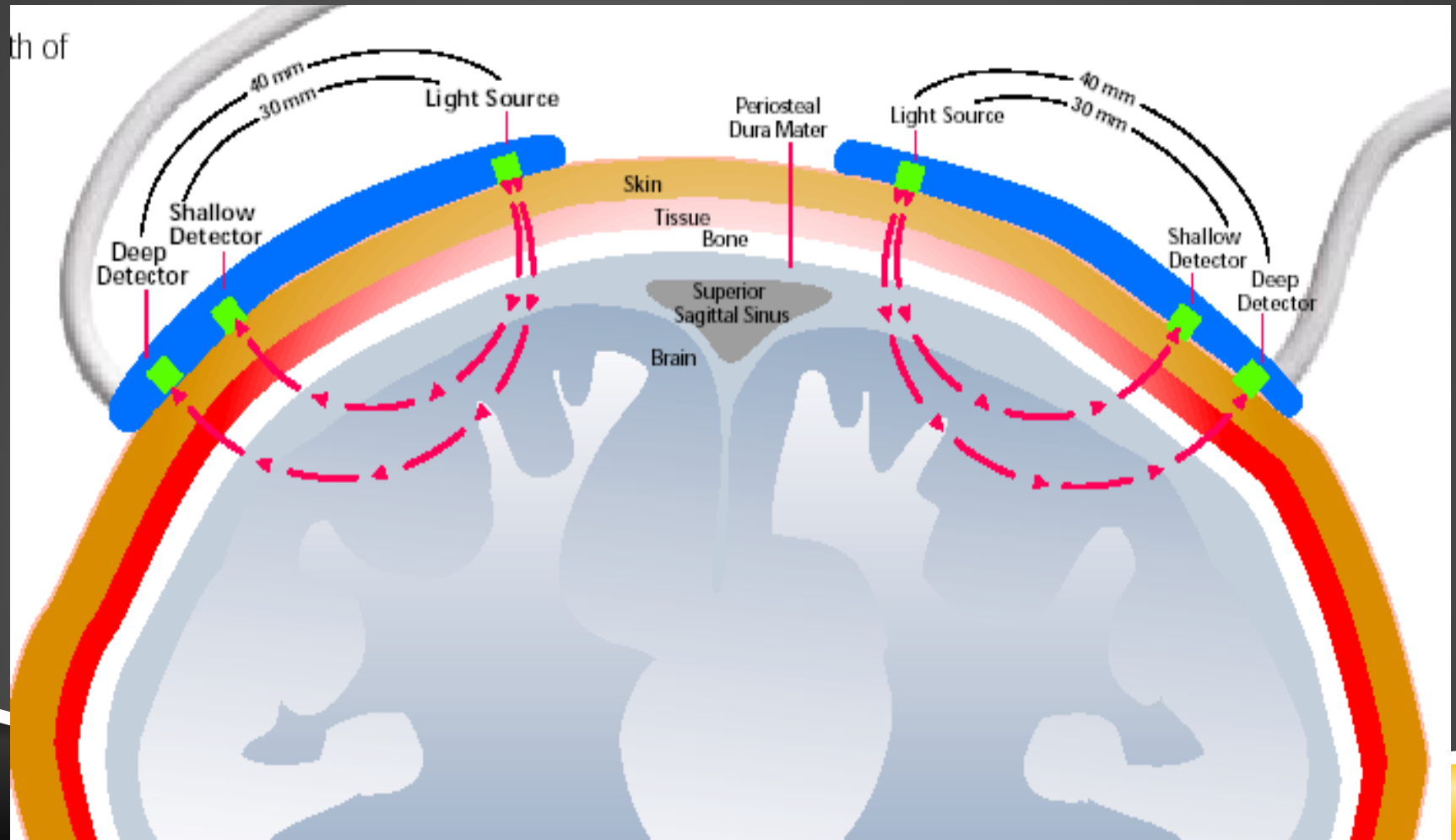
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HYPOPERFUSION AFTER CARDIAC ARREST

Mismatching of O₂ delivery to O₂ uptake



CEREBRAL OXIMETRY



Normal Range: somewhere between 50-80 much like ScvO₂



ELSEVIER

Resuscitation

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



Clinical paper

Regional cerebral oxygen saturation on hospital arrival is a potential novel predictor of neurological outcomes at hospital discharge in patients with out-of-hospital cardiac arrest[☆]

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179 pts, (14% with good recovery)

Recorded 1 minute post-ROSC

Cere OX < 25% , (61%)

spec-0.77, sens -I AUC = 0.919

Better predictor than BE or Lactate for poor outcome

Cere OX	< 25%	25-40%	>40%
% CPC 1-2	0%	22%	50%

**SAME GROUP WITH A LARGER SAMPLE
SHOWED SIMILAR RESULTS**



CEREBRAL OXIMETRY IN PRE-HOSPITAL CARDIAC ARREST

- ▶ rSO_2 value is predictive of Mortality

	Dead	Not Dead	Total
Any 15	32	0	32
Never 15	2	1	3
Total	34	1	35

UTILITY OF CERE OX IN OOHCA

- ▶ **64 patients enrolled in ED**
- ▶ **56% male**
- ▶ **mean age 69**
 - ▶ **Range (16 to 93)**
- ▶ **75% were witnessed arrests**
- ▶ **31% in a public place**
- ▶ **44% had bystander CPR**

RESULTS: PREDICTING GOOD CPC

Group	Sens	Spec	LR +	LR-
VF	0.89 (0.86-0.94)	0.62 (0.28-0.74)	1.52	0.07
Initial rSO2	0.84 (0.78 - 0.90)	0.38 (0.30 - 0.46)	1.35	0.4
Final rSO2	0.98 (0.89-0.99)	0.38 (0.30-0.46)	1.57	0.06

OXIMETRY TRENDS IN THE ED

rso2 Trend	Good CPC	Poor CPC
ABN -> ABN	0	10
ABN -> NL	3	7
NL -> ABN	0	7
NL -> NL	16	21

PREDICTORS OF POOR OUTCOME

Group	Sens
V-Fibb	50%
Asystole	91%
PEA	95%
Final ABN rSO2	100%

MORE RECENT DATA

- ▶ We analyzed 32 patients:
 - ▶ 69% were male, mean age 62.5
- ▶ 30 (93.8%) witnessed
- ▶ 23 (71.9%) had bystander CPR
- ▶ VF/VT 19%, PEA 40%, Asystole 34% and 2 unknown.
- ▶ 7 (22%) with good CPC (1-2) at hospital discharge.

MORE RECENT DATA

- ▶ Univariate analysis showed only the average rSO₂ 4-hours post ROSC was predictive of good outcome ($p < 0.003$)
- ▶ Initial Mean Arterial Pressure (MAP) was a good prognosticator ($p < 0.087$)
- ▶ Logistic regression revealed only average rSO₂ 4-hours post ROSC as indicative of good outcome ($p < 0.086$).

CEREBRAL OXIMETRY WITH THE USE OF HYPOTHERMIA

- ▶ 17 enrolled currently
 - ▶ 47% (8/17) survival rate
 - ▶ 88% with CPC 1 or 2
 - ▶ 41% overall good neurologic recovery

RESULTS

group	Initial Rhythm	Bystander CPR	Est. Downtime (mins)	Mean age
CPC 1&2	5/7= VF, 1/7= PEA 1/7 = Asy	71%	4 ± 2.1	59 ± 21
CPC > 2	4/10 = VF 3/10=PEA 3/10 = Asy	67%	9 ± 9.9	74 ± 9.9

RESULTS

- ▶ **Cerebral oximetry overall did not correlate well with MAP or temperature**
- ▶ **All patients had some decrease in oximetry during cooling**

CEREBRAL OXIMETRY DURING THERAPEUTIC HYPOTHERMIA

group	Mean rSO ₂ cooling	Mean rSO ₂ rewarming
CPC 1&2	57.2 ± 9.1	61.4 ± 10.2
CPC > 2	53.6 ± 16.7	49.6 ± 21.1
P value	p < 0.001	p < 0.001

CORRELATION: RSO₂ VS. PH/PCO₂

rSO₂ (survivors)

	LEFT	RIGHT	AVG
pH	-0.41	-0.27	-0.33
pCO ₂	0.16	0.06	0.08

rSO₂ (non-survivors)

	LEFT	RIGHT	AVG
pH	-0.45	-0.55	-0.48
pCO ₂	0.51	0.43	0.49

POTENTIAL IMPACT

- ▶ Early prognosticator
- ▶ Has the potential to drive additional testing
- ▶ Goal organ directed therapy
- ▶ Tailor therapies to values