

REAL ASSESSMENT OF ROSC REQUIRES AN ARTERIAL CATHETER DURING ONGOING CPR

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Table 1: Materials

• Sterile gloves	
• Arterial catheter placement set including antiseptic, compresses, sterile drape, sutures, knife, tegaderm,	2 cc syringe, 10 cc syringe, NaCl flasks
• Arterial catheter: 18 GA 16 cm (Seldinger style)	



BACKGROUND

Palpating peripheral pulsations has been shown to be a non-specific and non-sensitive strategy for assessment of life-supporting output in ROSC.¹ Non-invasive blood pressure measurements take too long, particularly in the low-pressure conditions.² Early use of arterial lines in mature in-hospital settings can optimize care by showing curves and shortening pause time.³

The principal focus of CPR is to reinstate, or allow for the reestablishment of a life-supporting rhythm and circulation. However, palpation of peripheral pulsations remains difficult, is un-calibrated and time consuming. Although once ALS-CPR has been started team members have few tasks, invasive procedures during the resuscitation remains 'underused'.

Use of invasive measurements (i.e. arterial catheter in femoral, radial or brachial artery) can allow for rapid, reproducible, calibrated, indications of return of a life supporting rhythm. They require a skill set typically available within an ALS-team, and materials in standard practice. (Table 1 and 2)

While invasive pressures seem to become a priority after ROSC, and once started, a resuscitation is a structured, manageable procedure. Why not use them at an early stage?

PURPOSE

Review of in-hospital coded database to assess criteria and effects of rhythm/output check pauses and procedure.

METHODS

- Literature search concerning in-hospital deployment of arterial lines during resuscitations
- Search in database for:
 - MRx based resuscitations
 - Registration of arterial catheter access
- Effect on time from last compression to first compression in rhythm and output checks

References:

- ¹ Brearley S, et al. Ann R Coll Surg Engl 1992;74:169-71
² Meany PA, et al. Circulation 2013;128:417-35
³ Hoppu S, et al. Resuscitation 2011;82:1460-3

FINDINGS & CONCLUSIONS

- 603 assessable MRx CPR cases with 66 arterial catheters
- Overall, 9 ± 7 sec versus 16 ± 16 sec rhythm/output pause duration
- 10 ± 7 sec versus 20 ± 19 sec in "potentially perfusing" situations (n=366)

Little ambiguity in assessment or uncertainty in team:

- No curve → no output (deal with rhythm) → restart compressions
- > 60 mmHg ≈ ROSC (vasopressor titration !)

Placement time median 2-4 minutes (after 1st cycle), high success rate

Table 2: Procedural aspects

Steps	Comments / considerations
BLS established and high quality, ALS initiated	Initial 2 to 4 minutes
Nurse & doctor prep in at right groin.	Note: Right because most caregivers are right handed (artery-vein-nerve)
All materials 'dumped' in field → freeing nurse Resuscitation cycles continue	Note: Ultrasound optional Note: Focus on placement
Blood gas sample and attachment to pressure sensor and monitor	Team informed that rhythm / output check includes invasive pressure

TAKE HOME MESSAGE

Placement of an arterial catheter during on-going resuscitation is feasible, has positive effects of limiting hands-off time, and allows improved treatment strategies.

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