Out-of-hospital cardiopulmonary resuscitation with the AutoPulse™ system: A prospective observational study with the new load-distributing band chest compression device

Krep H, Mamier M, Breil M, *et al. Resuscitation* 2007. 73: 86-95.

Objective: To evaluate the effectiveness, safety and how practical the AutoPulse™ resuscitation device is in out-of-hospital cardiac arrest.

Methods:

- Prospective observational study
- 46 patients in Bonn city resuscitated using the AutoPulse™
- Patients enrolment decided upon individually by emergency physician on scene
- Return of spontaneous circulation (ROSC) and end-tidal carbon-dioxide ($etCO_2$) values during CPR were assessed
- Safety was assessed by number of injuries occurring as a result of using the device
- Time to set up device was measured
- Patients with ROSC were visited in ICU for first 3 days following admission than followed via telephone calls to ICU, patient, or patients family if they were discharged home

Results:

- 63.0% of patients resuscitated with AutoPulse™ were witnessed arrests and in 30.4% bystander CPR was initiated
- Mean time from arrival on scene to AutoPulse™ setup was 4.7 +/- 5.9 minutes (median 2; range 1-25 min)
- 54.3% (25/46) of patients had ROSC after AutoPulse™-CPR
    - 39.1% (18/46) with ROSC were admitted to ICU – (7 died in transport)
    - 30.4% (14/46) with ROSC survived longer than 72 hours
    - 21.8% (10/46) survived to be discharged from the ICU
- Of 10 who survived to ICU discharge → 2 complete neurologic recovery, 1 suffered mild to moderate neurologic disability, 7 had severe neurologic disability
- Setup time – 47.8% of patients setup within 2 min, 67.4% of patients within 3 min
- No severe chest compression injuries (rib fractures or ruptured liver) were observed but were only based on those who survived to ICU admission → no post-mortem chest xrays were performed

Bottom Line: The AutoPulse™ showed ROSC rates of 54.3%. Decision to apply AutoPulse™ was made individually by emergency physicians at the scene with a high rate of witnessed arrests (63.0%) and high rate of bystander CPR (30.4%). Patient enrolment is susceptible to bias because decision to apply AutoPulse™ made by individual physicians on scene. Applicability to EMS is questionable since most EMS crews do not have an emergency physician in attendance. This study did not compare ROSC rates using manual CPR to a comparable cohort. Subsequent studies have showed conflicting evidence for AutoPulse™. Further comparative studies required to acquire additional data to find more definitive results.