Evolution of Arterial Pressure and Brain SrO₂ during Basic Life Support Resuscitation in a Translational Model of Cardiac Arrest

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BACKGROUND and PURPOSE
Tissue perfusion during Basic Life Support (BLS) resuscitation depends on hemodynamic support provided by chest compressions. However, it remains unclear how the ischaemia/reperfusion phenomena influences hemodynamic stability during prolonged BLS. We aimed to study the arterial pressures and brain tissue perfusion in a porcine model of cardiac arrest (CA) and BLS.

METHODS and RESULTS
Six female pigs underwent an 8-minute non-treated ventricular fibrillation followed by BLS resuscitation for 15 (n=3) and 30 minutes (n=3). Invasive systolic, mean and diastolic arterial pressures (SAP, MAP and DAP) and brain SrO₂ were recorded every minute: arterial pressures rapidly dropped during 8-minutes untreated cardiac arrest and rapidly increased when BLS manoeuvres began. SAP reached its peak at 3 minutes and then gradually drop over-time. MAP and DAP were maintained low during BLS with also tendency to drop. Brain SrO₂ during BLS did not correlate with the evolution of SAP, not showing any improvement once BLS manoeuvres began.

CONCLUSION
In a large-animal model of CA, arterial pressures drop over-time during the BLS despite mechanical chest compressions. Brain tissue perfusion does not follow arterial pressure pattern during BLS.