Introduction:
Its afterload reducing effects make PEEP the treatment of choice for cardiogenic pulmonary edema. Studies indicate that PEEP may lower coronary blood flow. Its effects on left ventricular contractility is unclear. Most of the surrogate measures for cardiac contractility are dependent on afterload and contractility assessment under PEEP may therefore be biased. We have investigated cardiac contractility under PEEP with the endsystolic pressure volume relationship (ESPVR) as a load-independent measure of contractility.

Methods:
23 patients scheduled for coronary angiography were ventilated with CPAP and a full face mask at three levels of PEEP (0, 5 and 10 cmH2O) in random order. Structural cardiac pathologies were excluded with echocardiography. At every PEEP level, left ventricular pressure volume loops (Millar conductance catheter with INCA System, Leycom, Netherlands) were obtained. The endsystolic elastance was derived from a PV-loop family under preload reduction with an Amplatzer sizing balloon in the inferior caval vein. All participants gave written informed consent. The study was approved by the Bernese ethics committee.

Results:
5 women and 18 men with an age 59±6 years were studied. Ejection fraction was 70±8 % at baseline. Mean ESPVR at PEEP levels of 0, 5 and 10 were 2.64±1.3, 2.56± 1.18 and 2.33±0.88 mmHg/mL (p = 0.318, repeated measurements ANOVA). dP/dt and ejection fraction did not differ between the PEEP levels (p=0.138 and 0.48).

Conclusion:
Moderate levels of PEEP did not influence endsystolic elastance. Higher PEEP and patients in cardiogenic shock should be investigated.