Systematic Review of Capnography Versus Standard Monitoring for Emergency Department Procedural Sedation and Analgesia

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Introduction
Capnography is widely used for procedural sedation and analgesia (PSA) to prevent cardio-respiratory compromise. We sought to assess whether capnography in addition to standard monitoring is more effective at preventing adverse events than standard monitoring in emergency department (ED) patients undergoing PSA.

Methods
We searched the Cochrane Central Register of Controlled Trials (2016), Medline (1980 to 2016), EMBASE (1980 to 2016) and CINHAL (1982 to 2016) for randomized and quasi-randomized trials of ED patients requiring PSA with no language restrictions. Ongoing trials were searched for on www.controlled-trials.com, www.clinicalstudyresults.org and http://clinicaltrials.gov. Primary authors of included studies as well as scientific advisors of capnography device manufacturers were contacted to identify unpublished studies. Conference abstracts of four organizations were hand-searched for the past five years. Potentially relevant trials were selected for full review by two authors using a selection tool. Agreement was measured using kappa statistics. Data was abstracted by two authors and verified where possible with primary authors. Methodological quality was assessed using the Cochrane “Risk of bias” tool. Forest plots, Chi² and I² statistics assessed for heterogeneity. In the absence of heterogeneity, we conducted a meta-analysis using both random and fixed effects models. For dichotomous variables, pooled statistics were calculated as relative risk with 95% confidence intervals.

Results
Our search identified 3312 publications of which 43 were selected for full review. Three studies with a total of 1272 subjects were included in this review (κ=1.00). There were no differences in the rate of oxygen desaturation (RR=0.89; 95%CI 0.48,1.63) and hypotension (RR=2.36; 95%CI 0.98,5.69) between the two groups. There was greater need for airway interventions in adult patients in the capnography group (RR=1.42; 95%CI 1.15,1.177; NNH=13).

Conclusions
The addition of capnography to standard monitoring in ED PSA does not reduce the rate of clinically significant adverse events.