An open suction system in mechanically ventilated patients may contaminate the inanimate environment and promote cross-transmission of pathogenic microorganisms. Jongerden et al. investigated whether a closed suctioning system reduces cross-transmission of gram-negative bacteria.

This was a prospective crossover trial in four ICUs. Both open and closed suctioning were implemented unit wide and used for all eligible patients during periods of six months. A crossover of both systems was used. All patients admitted to the ICU for > 24 hours were included. Oral antiseptics or selective decontamination were not in use. The primary study outcome was cross-contamination with pseudomonas, acinetobacter and enterobacter species. Secondary outcomes were acquisition rates with several gram-negative bacteria resistant to third-generation cephalosporins. Surveillance cultures were obtained on admission and twice weekly. A total of 1110 patients were included (585 with 5720 patient-days using the closed suctioning system and 525 with 5599 patient-days using the open suctioning system). There were small baseline differences between the two groups. Thirty-seven percent in both groups acquired colonization with at least one of the marker pathogens. Overall acquisition rates were 35.5 and 32.5 per 1000 patient-days at risk during closed and open suctioning, respectively (NS). There were 15 events of cross-transmission for Pseudomonas during closed suctioning and 16 during open suctioning, corresponding to 3.4 and 4.1 events per 1000 patient-days at risk respectively (unadjusted HR, 0.88; 95% CI, 0.43–1.80). Cross-transmission of acinetobacter was more frequent in the closed suctioning group.

The authors should be congratulated for this excellent study. The results clearly show that a closed suctioning system does not prevent acquired colonization and cross-contamination with the most important gram-negative bacteria. Meta-analysis shows that closed suctioning does not reduce VAP or mortality. A positive effect of a closed suctioning system on preventing derecruitment is also questionable. The routine use of a closed suctioning system cannot be recommended.


Predicting fluid responsiveness after cardiac surgery

The ability of cardiac filling pressures and static filling volumes to predict fluid responsiveness may depend on left ventricular systolic function. Trof et al. hypothesized that filling pressures may be superior in patients with reduced left ventricular function.

Patients after CABG and major vascular surgery were included when presumed hypovolaemic. Cardiac output and global end-diastolic volume (GEDV) was measured using the double-indicator transpulmonary thermodilution technique. Global ejection fraction (stroke volume divided by GEDV) was used as an indicator of left ventricular systolic function (normal 25 – 35%). Patients received several fluid challenges based on a previously described protocol. A total of 32 patients were included. Twelve patients had a GEF < 20% (reduced left ventricular function) and twenty had a GEF > 20% (normal left ventricular function). When GEF was low only pulmonary artery occlusion pressure (PAOP) and CVP predicted fluid responsiveness (increase in CO > 15%). The AUC for PAOP was 0.84 with an optimal cut off of 9 mm Hg. The AUC for CVP was 0.77 with an optimal cut off of 5 mm Hg. However when GEF was near normal GEDV particularly predicted fluid responsiveness (AUC 0.89, optimal cut off 623 ml/m²). The AUC for CVP was also significant (0.73, p-value 0.013 with an optimal cut off of 4 mm Hg)

This is an important study showing that in patients with a reduced left ventricular function, filling pressures may better predict fluid responsiveness than filling volumes. However, these data only apply to this particular patient population ventilated with low PEEP levels and apparently without right ventricular dysfunction and relevant diastolic dysfunction. For example, it has been shown that filling pressures do not predict fluid responsiveness in patients with sepsis even when left ventricular function is depressed. Remarkably, the authors did not study the predictive value of several dynamic tests (stroke volume variation, pulse pressure variation and passive leg raising) for fluid responsiveness. In general, the predictive value of these tests appears to be better and it could be interesting to see if dividing patients based on the GEF would have changed the results.