

Changeovers from the nearly empty to the full syringe can be performed manually using the quick change technique (QC) or automatically using smart infusion pumps (SIP) that link two syringes” Greau et al (2015).

Abstract:

Background: Norepinephrine is a key drug for treating shock but has a short half-life that requires continuous intravenous administration to maintain the constant plasma concentration needed to obtain a stable blood pressure. The small volume of the syringes used in power infusion pumps requires frequent changeovers, which can lead to norepinephrine flow interruptions responsible for hemodynamic instability.

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Changeovers from the nearly empty to the full syringe can be performed manually using the quick change technique (QC) or automatically using smart infusion pumps (SIP) that link two syringes. The purpose of our study was to evaluate the hypothesis that, compared to QC, SIP for norepinephrine changeovers was associated with less hemodynamic instability.

Methods: After information of the patient or next of kin, patients receiving norepinephrine for shock were allocated to QC or SIP changeovers. QC changeovers were performed by a nurse, who started a new loaded pump when the previous syringe was nearly empty. SIP changeovers were managed automatically by SIP workstations. The primary outcome was the proportion of changeovers followed by a ≥ 20 % drop in mean arterial pressure (MAP).

Results: 411 changeovers were performed, 193 in the 18 patients allocated to QC and 218 in the 32 patients allocated to SIP. Baseline patient characteristics were similar in both groups. The proportion of changeovers followed by an MAP drop ≥ 20 % was 12.4 % (24/193) with QC and 5.5 % (12/218) with SIP ($P = 0.01$). By multivariate analysis, two factors were independently associated with a significantly decreased risk of ≥ 20 % MAP drops during changeovers, namely, SIP (odds ratio, 0.47; 95 % confidence interval, 0.22-0.98) and norepinephrine dosage > 0.5 $\mu\text{g}/\text{kg}/\text{min}$ (odds ratio, 0.39; 95 % confidence interval, 0.19-0.81).

Conclusions: The risk of MAP drops ≥ 20 % during changeovers can be significantly diminished using SIPs instead of the QC method.

Full Text

Reference:

Greau, E., Lascarrou, J-B., Le Thuaut, A., Maquigneau, N., Alcourt, Y., Coutolleau, A., Rousseau, C., Erragne, V. and Reignier, J. (2015) Automatic versus manual changeovers of norepinephrine infusion pumps in critically ill adults: a prospective controlled study. *Annals of Intensive Care*. 5:40.

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