Monitoring quality of care for Peripheral Intravenous Catheters; feasibility and reliability of the Peripheral Intravenous Catheters mini Questionnaire (PIVC-miniQ)

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Introduction
Peripheral intravenous catheter (PIVCs) is the easiest, quickest and least resource demanding way to administer intravenous fluids, medication and blood transfusion. PIVCs are considered harmless devices, however they account for a mean of 38% of catheter associated bloodstream infections (CABSI) of *Staph.aureus* (1), which is a serious complication often in need of long antibiotic treatment, ICU stay and with high mortality. PIVC related CABSI are preventable complications if PIVC quality is addressed properly. However, there exist no quick validated tool to assess and improve PIVC quality and thereby CABSI reduction (2). Thus, we aimed to develop and test validity for an efficient screening tool regarding overall PIVC quality for systematic measurements of quality improvement to reduce PIVC related CABSI.

Methods
The *PIVC-miniQ* consists of 16 items (yes/no) regarding observation of problems related to the insertion site, condition of dressing and equipment, documentation, and indication for use. Each problem gives one point and all items can be summed up in a total score (0-16). Two hospitals tested the *PIVC-miniQ* for feasibility and inter-rater agreement. Each PIVC was assessed twice, 2-5 minutes apart by two independent raters. We calculated the intraclass correlation coefficient (ICC) for each hospital and overall. For each of the 16 items, we calculated negative agreement, positive agreement, absolute agreement and Scott's pi.

Results
Sixty-three raters evaluated 205 PIVCs in 177 patients. ICC between raters was 0.678 for hospital A, 0.577 for hospital B, and 0.604 for the pooled data. Mean time used for each PIVC assessment was 3.02 (SD 1.76) minutes, where most of the time was used to answer the documentation item. The most frequent insertion site symptom was "pain and tenderness" (14.4%), followed by "redness" (12.6%), whereas the most prevalent overall problem was lack of documentation of the PIVC (26.8%). Up to 50% of PIVCs were placed near joints or were inserted under suboptimal conditions, i.e. emergency department or ambulance.

Conclusions
We found the *PIVC-miniQ* sum score to be a reliable and efficient outcome measure for quality control, taking only 3 minutes on average to complete. The measure of consistency can be described as moderate to high with an ICC of 0.604 for the sum score. The observed PIVC quality were far from optimal and the *PIVC-miniQ* can thus reliably measure development in PIVC quality in point prevalence audits and evaluate interventions to reduce CABSI.

References and Grant acknowledgments

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