



Improving patient safety during insertion of peripheral venous catheters

How a multimodal intervention programme increased the hand hygiene compliance in patient safety relevant steps when placing a peripheral venous catheter (PVC).

Observational intervention study at the University Hospital Eppendorf in Hamburg under active involvement of the **HARTMANN SCIENCE CENTER**

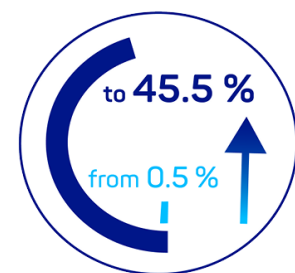
STUDY RESULTS

Significant improvement of hand hygiene compliance before patient contact



Before patient contact

Significant improvement of hand hygiene compliance before aseptic tasks



Before aseptic task

STUDY DESIGN

Observational intervention study



202 observed PVC insertions in the **intervention period**
207 observed PVC insertions in the **control period**

STUDY PERIOD



2012–2013;
intervention phase of 5 month

MEASUREMENTS

Measurements during intervention phase



Observation of procedures for peripheral venous catheter insertions

INTERVENTIONS

Focus on optimizing the procedure for inserting a PVC



Training



Exercises on a dummy



eLearning programme



Tray sheets and poster



Individual feedback



Research for
infection protection



BACKGROUND

Peripheral venous catheters (PVCs) are frequently used in hospitalized patients but increase the risk of nosocomial blood-stream infection. Based on evidence-based guidelines, standard operating procedures can be developed, which describe specific steps of procedures and aim to reduce infections.

GOAL

Goal of the study was to determine the use of specific steps for insertion of PVCs in clinical practice and to implement a multi-modal intervention aiming to improve compliance and the optimum order of steps.

DESIGN AND METHODS

The study was conducted at University Hospital Hamburg in 2012 and 2013. An optimum procedure for inserting a peripheral venous catheter was defined based on guidelines of the WHO, CDC and Robert Koch Institute (RKI). The following five steps with relevance for patient safety (evidence level 1A or 1B) were identified for observation of compliance and for intervention:

- hand disinfection before patient contact
- skin antisepsis of the puncture site
- no palpation of treated puncture site
- hand disinfection before aseptic procedure
- sterile dressing on the puncture site

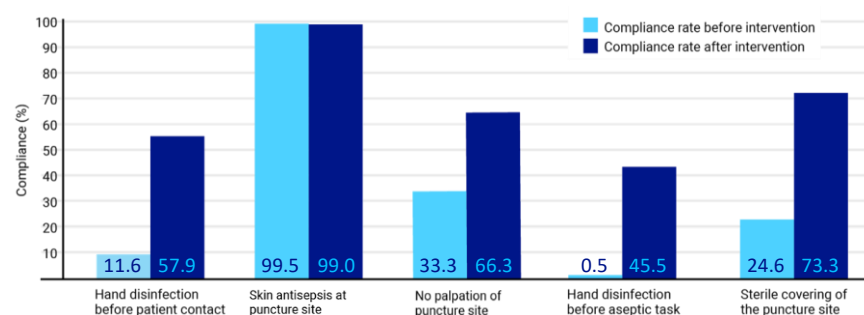
A research nurse observed and recorded procedures for peripheral venous catheter insertion done by doctors and nurses in four different hospital departments (endoscopy, central emergency admission, pediatrics, and dermatology). Then, a multimodal intervention with five elements was established (teaching session, dummy training, e-learning tool, tablet and poster, and direct feedback), followed by a second observation period. During the last observation week participants evaluated the intervention.

RESULTS

Compliance: In the control period 207 insertions of PVCs were observed, in the intervention period 202. Most of the insertions were observed in the endoscopy unit (n=113 and n=82, respectively). The intervention led to a significant increase in compliance for four of the five specific steps. Compliance increased significantly among both, doctors and nurses (data not shown). No difference was seen in compliance with skin antisepsis, which was high before and after the intervention.

The intervention also led to an increase in performing the specific steps in the optimal order (e.g. from 8.3% to 58.1% when four of five steps were performed by the health care workers). The intervention was considered helpful by 46.8% of participants, as neutral by 46.8% and as disruptive by 6.4%.

Improvement of hand hygiene compliance



Differences before and after intervention, except for the step "skin antisepsis at puncture site", were significant ($p < 0.001$).

CONCLUSION

The described multimodal strategy is an effective tool to improve compliance with patient safety relevant steps during PVC insertion.