A comparison of hydrophobic polyurethane and polyurethane peripherally inserted central catheter: results from a feasibility randomized controlled trial

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Purpose: To evaluate the feasibility of an efficacy trial comparing a hydrophobic polyurethane peripherally inserted central catheter (PICC) with a standard polyurethane PICC.

Methods: This pilot randomized controlled trial (RCT) was conducted between May 2017 and February 2018. Adult participants (n=111) were assigned to hydrophobic polyurethane PICC with proximal valve (intervention) or a polyurethane PICC with external clamp (standard care). Primary outcome was trial feasibility including PICC failure. Secondary outcomes were central-line-associated bloodstream infection, local infection, occlusion, thrombosis, fracture and dislodgement, phlebitis, local or systemic allergic reaction, and PICC dwell time.

Results: All feasibility outcomes were achieved, apart from eligibility criteria. In total, 338 patients were screened, 138 were eligible (41%), and of these 111 were randomised (80%). Patients received the allocated PICC in 106 (95%) insertions. No patients withdrew from the study and there was no missing data. PICC failure was 24% (13/55) in the intervention group and 22% (12/55) in the standard care group (p=0.820). PICC failure per 1,000 PICC-days was 16.3 in the intervention group and 18.4 in the control group (p=0.755). The average dwell time was 12 days in the intervention and eight days in the control group.

Conclusions: This study demonstrates the feasibility of an efficacy trial of PICC materials in an adult population, once adjustments were made to include not only in-patients, but also patients being discharged to the Home service.