Recommendations prescribe daily intravenous administration set (IVAS) replacement for parenteral nutrition (PN) comprising intravenous fat emulsions (IVFE) due to risk of micro-organism growth and resultant central-line associated bloodstream infections (CLABSIs), but system disconnection for this practice may allow contamination and CLABSIs” Gavin et al (2018).

Abstract:

BACKGROUND: Recommendations prescribe daily intravenous administration set (IVAS) replacement for parenteral nutrition (PN) comprising intravenous fat emulsions (IVFE) due to risk of micro-organism growth and resultant central-line associated bloodstream infections (CLABSIs), but system disconnection for this practice may allow contamination and CLABSIs.

MATERIALS AND METHODS: Laboratory experiments and model development were used to simulate PN administration after contamination from healthcare workers’ hands. This study observed the growth of micro-organisms known to cause CLABSIs in a variety of PN and other IV fluids and developed a model to investigate the effect of delaying IVAS replacement on microbial growth for up to 7 days.

RESULTS: Micro-organisms grew at different rates and were affected by solution type. In static experiments, growth was supported in IVFE and all-in-one PN, but suppressed in 50% glucose. Growth patterns were consistent over time for Staphylococcus epidermidis, Staphylococcus aureus, and Candida albicans in IVFE, all-in-one PN, and 0.9% sodium chloride in both static and dynamic experiments. C. albicans grew exponentially to clinically significant numbers in all-in-one PN and IVFE IVAS after 30 hours, but negligible growth of S. epidermidis or S. aureus occurred for 7 days.

CONCLUSION: All-in-one PN and IVFE support the C. albicans growth after minimal initial contamination, with micro-organisms migrating from the fluid bag to the central venous access device. Improved aseptic nontouch technique during clinical practice is vital to prevent contamination. Daily IVAS replacement of for all-in-one PN and IVFE should
continue until the safety of prolonging IVAS replacement is confirmed by randomized trials.

Reference:
