



We investigated the efficacy and safety of a novel antibiotic-free lock solution formed from gas plasma-activated disinfectant (PAD)”  
Bhatt et al (2018).

Abstract:

Antimicrobial lock solutions are important for prevention of microbial colonization and infection of long-term central venous catheters. We investigated the efficacy and safety of a novel antibiotic-free lock solution formed from gas plasma-activated disinfectant (PAD). Using a luminal biofilm model, viable cells of methicillin-resistant *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Pseudomonas aeruginosa*, and *Candida albicans* in mature biofilms were reduced by 6 – 8 orders of magnitude with a PAD lock for 60 minutes. Subsequent 24-hour incubation of PAD-treated samples resulted in no detectable regrowth of viable bacteria or fungi. As a comparison, the use of a minocycline/EDTA/ethanol lock solution for 60 minutes led to regrowth of bacteria and fungi, up to  $10^7$  –  $10^9$  CFU/ml, in 24 hours. The PAD lock solution had minimal impact on human umbilical vein endothelial cell viability, whereas the minocycline/EDTA/ethanol solution elicited cell death in nearly half of human endothelial cells. Additionally, PAD treatment caused little topological change to catheter materials. In conclusion, PAD represents a novel antibiotic-free, non-cytotoxic lock solution that elicits rapid and broad-spectrum eradication of biofilm-laden microbes and which shows promise for the prevention and treatment of intravascular catheter infections.



## Antibiotic-free vascular catheter lock solution formed from gas plasma-activated disinfectant | 2

### Reference:

Bhatt, S., Mehta, P., Chen, C., Daines, D.A., Mermel, L.A., Chen, H.L. and Kong, M.G. (2018) Antimicrobial Efficacy and Safety of a Novel Gas Plasma-Activated Catheter Lock Solution. Antimicrobial Agents and Chemotherapy. May 29th. .

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