



According to our in vitro data, an ethanol-based lock solution with 40% ethanol + 60 IU heparin administered daily for 72 hours is sufficient to almost eradicate the metabolic activity of bacterial and fungal biofilms” Alonso et al (2018).

Summary:

Ethanol-based lock therapy (LT) solutions are used as an alternative to antibiotics for the conservative management of catheter-related bloodstream infection. However, no clear consensus on regimen or dose has been reached. Our objective was to find the ethanol-based lock solution containing a sufficiently low concentration of ethanol for reduction of the metabolic activity of bacterial and fungal biofilms. Using an in vitro model, we tested 3 concentrations of ethanol (25%-40%-70%), with and without 60 IU of heparin, at 6 different time points and against 24-hour preformed biofilms of *Staphylococcus aureus* ATCC29213, *Staphylococcus epidermidis* (clinical isolate), *Enterococcus faecalis* ATCC33186, *Candida albicans* ATCC14058, and *Escherichia coli* ATCC25922. We measured the reduction in the metabolic activity of the biofilm using the tetrazolium salt assay and considered LT to be successful when metabolic activity fell by >90%. We then tested regrowth inhibition (RI) within 24 hours and 7 days after each LT regimen only at the ethanol concentration of the most successful LT regimen. The most successful LT was achieved with 40% ethanol + 60 IU of heparin only at 24 hours, 72 hours, and 24 hours for 7-day regimens ( $p < 0.05$ ). However, none of the regimens reached 25% RI within 7 days of therapy. According to our in vitro data,

an ethanol-based lock solution with 40% ethanol + 60 IU heparin administered daily for 72 hours is sufficient to almost eradicate the metabolic activity of bacterial and fungal biofilms. Future studies are needed to study cell regrowth after LT.

Reference:

Alonso, B., Pérez-Granda, M.J., Rodríguez-Huerta, A., Rodríguez, C., Bouza, E. and Guembe, M. (2018) The optimal ethanol lock therapy regimen for treatment of biofilm-associated catheter infections: Results from an in vitro study. *The Journal of Hospital Infection*. April 10th. . .

DOI: <https://doi.org/10.1016/j.jhin.2018.04.007>.

