



To investigate under real-life conditions the temperature variations of antibiotic solutions contained in elastomeric pumps, and to examine under such conditions the stability of five antibiotics” Voumard et al (2017).

Abstract:

Background: Elastomeric pumps can be used for the continuous administration of antimicrobials in the outpatient setting. A potentially limiting factor in their use is the stability of antimicrobials.

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Objectives: To investigate under real-life conditions the temperature variations of antibiotic solutions contained in elastomeric pumps, and to examine under such conditions the stability of five antibiotics.

Methods: Healthy volunteers carried the elastomeric pumps in carry pouches during their daily activities. A thermologger measured the temperatures every 15 min over 24 h. Antibiotic concentrations were measured by HPLC coupled to tandem MS.

Results: During daytime, the temperature of solutions in the pumps increased steadily, warming to $>30^{\circ}\text{C}$. During the night, when the pumps were kept attached to the waist, the temperatures reached up to 33°C . The use of white carry pouches avoided excessive temperature increases. Over seven experiments, cefazolin, cefepime, piperacillin and tazobactam were found to be stable over 24 h. Flucloxacillin showed a mean decrease in concentration of 11% ($P = 0.001$).

Conclusions: Real-life situations can cause significant temperature rises in elastomeric pumps, thereby potentially increasing the risk of antibiotic degradation. Patients should be instructed to avoid situations causing excessive temperature increases. Despite these temperature variations, cefazolin, cefepime, piperacillin and tazobactam were found to be stable over 24 h. A moderate degradation was noticed for flucloxacillin, albeit most probably not to an extent that might impair anti-infective efficacy.

Reference:

Voumard, R., Van Neyghem, N., Cochet, C., Gardiol, C., Decosterd, L., Buclin, T. and de Valliere, S. (2017) Antibiotic stability related to temperature variations in elastomeric pumps used for outpatient parenteral antimicrobial therapy (OPAT). *The Journal of Antimicrobial Chemotherapy*. February 3rd. .

DOI: <https://doi.org/10.1093/jac/dkw582>

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