



“The aim of this study was to determine the pH of solutions of dobutamine hydrochloride, fentanyl citrate, and their combination in 5% dextrose in water (D5W) under various light exposures and temperature conditions over time.” Barros et al (2014).

Reference:

Barros, D.P., Fonseca, F.L., Pedreira, M.D. and Peterlini, M.A. (2014) Hydrogen Profiles of Dobutamine Hydrochloride and Fentanyl Citrate Solutions According to Intravenous Administration Systems, Temperature, and Luminosity Conditions. *Journal of Infusion Nursing*. 37(5), p.362-368.

Impact of temperature, light exposure on pharmacological solutions [http://ctt.ec/fmcHe+](http://ctt.ec/fmcHe+@ivteam)  
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Abstract:

Factors such as temperature, light exposure, drug concentration, ionic strength, time of infusion, and duration of drug association can influence the effectiveness of pharmacological solutions, which can compromise the solutions’ quality, resulting in unstable solutions and drug incompatibility. The aim of this study was to determine the pH of solutions of dobutamine hydrochloride, fentanyl citrate, and their combination in 5% dextrose in water (D5W) under various light exposures and temperature conditions over time. The analysis was

performed by measuring the pH of the substances in both pharmacological (commercial) preparations and in D5W under dark fluorescent light in the presence or absence of sunlight exposures, intravenous apparatus packaging (clear and amber burettes), and temperature (22°C and 37°C). Samples were collected immediately after preparation and after 0.5, 1, 2, 3, 4, and 24 hours of exposure to the various conditions; data were analyzed using mean standard deviations. Of the 260 pH values obtained, 50 (19.2%) were from commercial preparations and 210 (80.8%) from solutions exposed to various experimental conditions. Significant pH differences were found among the vials of the commercial preparation drugs. The largest pH value difference (0.88) was observed for fentanyl citrate, in which a pH increase of 0.88 ( $4.23 \pm 0.62$ ) was observed. The combination of drugs in D5W resulted in more acidic values than those of fentanyl citrate and of D5W and fentanyl citrate in D5W, but they were closer to what was observed for the solution of dobutamine hydrochloride in D5W. This solution was more acidic than fentanyl citrate diluted in D5W. The lower acidity of fentanyl citrate had a minor influence on the final pH of the combined drug solution in D5W. Under most conditions, the drug solutions kept at 22°C had pH values that were more acidic and less variable. Temperature was a major factor controlling the chemical behavior of the solutions analyzed. Analysis of chemical behavior in response to light exposure indicated that the solutions were more stable over time when kept in the dark.

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