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# Stability of cefuroxime and piperacillin/tazobactam solutions stored in refrigerator temperatures

Jaakko Mustakallio, Miia Turpeinen, Sami Sneck, Terhi Seppälä, Tiina Kallio  
jaakko.mustakallio@pohde.fi  
Oulu University Hospital, Oulu, Finland

## What was done?

Chemical and microbiological stability of reconstituted cefuroxime 100mg/ml, cefuroxime 33mg/ml and piperacillin/tazobactam 80/10mg/ml solutions were evaluated for 28 days period

## Why it was done?

Reconstitution for commonly used antibiotics with hospital pharmacy automation could be used to optimize workflow at hospital wards and increase the quality of end-product.

Limited number of studies concerning the stability of antibiotics compounded with robotics restricts hospitals to introducing automation services widely. Stability of cefuroxime and piperacillin/tazobactam solutions differs between studies. Compounding environment, used materials and concentration are variables between studies.



Newicon IV Icon Twins compounding robot. ©Kai Tirkkonen/Kaipix

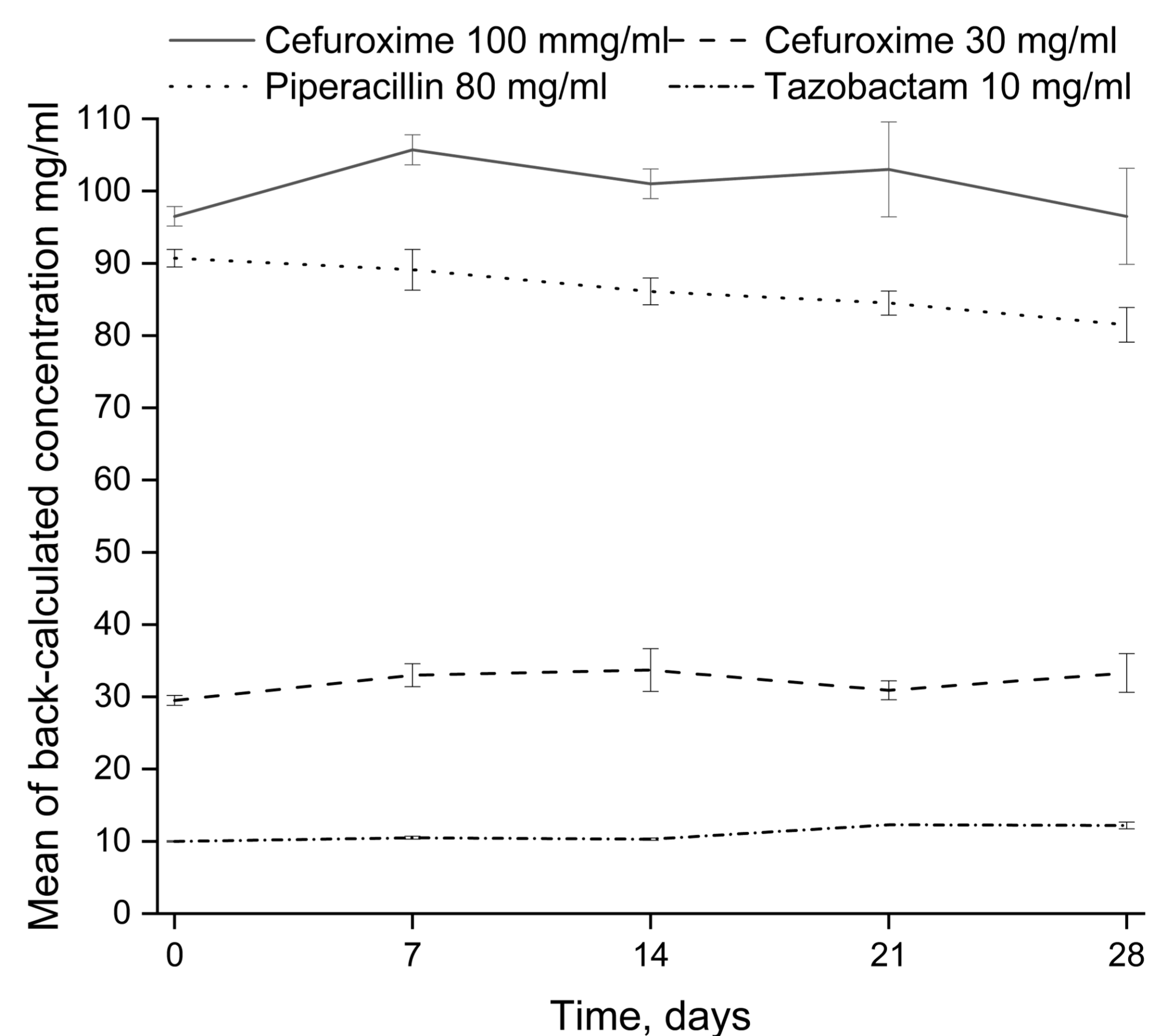
## How it was done?

Solutions were prepared using Newicon IV Icon Twins compounding system, which was located to A/B class cleanroom. Good manufacturing practice (GMP) were followed for compounding and environment

All samples were stored at refrigeration temperatures (2-8 ° C) and stored in original glass vials. 0,9% sodium chloride was used as solvent in cefuroxime 33 mg/ml and piperacillin/tazobactam 80/10mg/ml solutions, aqua sterilisata was solvent in cefuroxime 100mg/ml solution.

Evaluation of chemical and microbiological stability of cefuroxime 100 mg/ml, cefuroxime 33mg/ml and piperacillin/tazobactam 80/10 mg/ml solution were done with LC-MS analysis, pH analysis and sterility analysis.

Measuring points for LC-MS and pH analysis were 0,7,14,21 and 28 days from compounding. Microbiological stability was affirmed with analysis after 28 days.



The concentration of studied solutions was stable for 28 days when stored in 4 ° C. Standard deviation of side-by-side samples was calculated and shown in figure.

## What was achieved?

Stability of products for 28 days with measured parameters:

- ✓ Chemical stability
- ✓ Microbiological sterility
- ✓ Consistent pH value



Reconstituted solutions. © Terhi Seppälä

## What is next?

- Hospital pharmacies can provide reconstitution services for high volume antibiotics via automation with better knowledge and usability.
- Hospital wards are able to storage reconstituted solutions in medication room refrigerator instead of reconstituting solutions when needed.
- Results can be utilized in other hospital pharmacies and research can be extended to other antibiotics

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