



## **First-time evaluation of cefuroxime spine tissue concentrations in long-lasting spine deformity surgery (LLSDS) following personalized antibiotic prophylactic dosing**

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### **Background**

Antibiotic prophylaxis is central in preventing postoperative spine infections, yet knowledge of clinical spine tissue concentrations remains limited. Current antibiotic dosing regimens involve fixed doses based on empirical knowledge, non-clinical evidence, plasma samples, and inferior methodology.

The aim was to continuously evaluate cefuroxime spine tissue concentrations in LLSDS after personalized antibiotic prophylactic dosing.

### **Methods**

Twenty patients scheduled for LLSDS with hypotensive anaesthesia were included; mean age (range): 17.5 (12-74), mean BMI (range): 22.2 (16.2-37.7), mean surgery time (range): 4h49min (3h57min-6h9min)).

All patients received weight-dosed cefuroxime (20 mg/kg) intravenously 25 min before incision and after 4 hours. Microdialysis catheters were placed for sampling of cefuroxime concentrations in vertebral bone, paravertebral muscle, and subcutaneous tissue after surgery start. Upon wound closure, two catheters were placed in the profound and superficial part of the wound. Samples were obtained for 12 hours.

The primary endpoint was time with cefuroxime concentrations above the clinical breakpoint minimal inhibitory concentration for *Staphylococcus aureus* of 4 µg/mL in percentage (%fT>MIC<sub>4</sub>).

(a) patients' individual surgery time,

(b) first dosing interval (0-4 hours),

(c) second dosing interval (4-12 hours).

## **Results**

Mean cefuroxime %fT>MIC<sub>4</sub> (range) of:

(a) patients' individual surgery time was 100% (100-100%) in all investigated tissues.

(b) the first dosing interval was 93% (93-93%) in vertebral bone, paravertebral muscle, subcutaneous tissue, and 99% (99-100%) in plasma.

(c) the second dosing interval was between 87-94% (52-100%) in paravertebral muscle, subcutaneous tissue, the profound wound, the superficial wound, and 71% (42-100%) in plasma.

## **Conclusion**

Personalized dosing (20 mg/kg) cefuroxime administrations provided homogenous and therapeutic spine tissue concentrations across all investigated tissues in LLSDS with hypotensive anaesthesia (up to 11 hours) and may decrease the risk of postoperative spine infections in the future.

## **Disclosures**

Nothing to disclose

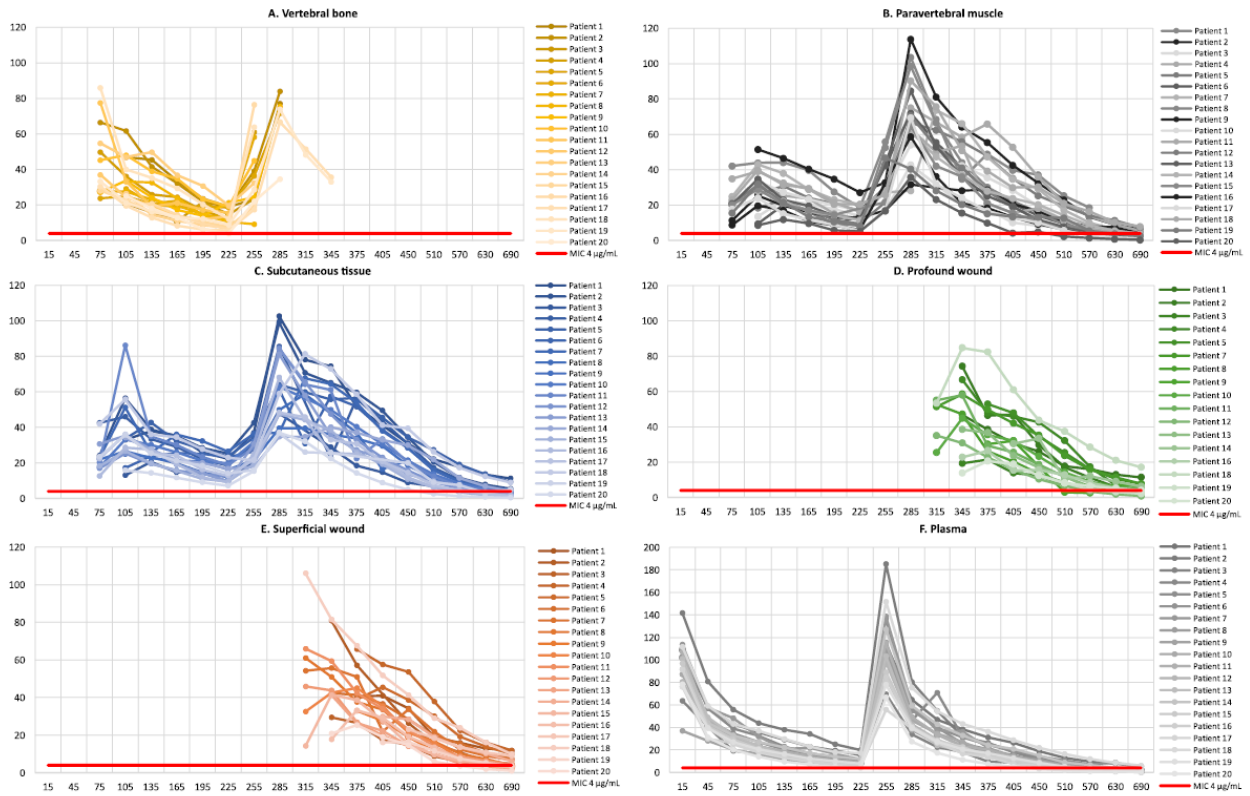


Figure 1: Individual concentration-time-curves. X-axis: time in min. Y-axis: cefuroxime concentrations in µg/mL.