Background and Importance Most intravenous admixtures (IVA) are prepared on the wards just before their administration to the patient, discarding the spare volume left in vials afterwards. This wasted volume is especially significant in injectables used in paediatrics. To avoid this, hospital pharmacy Central Intravenous Additive Services (CIVAS) centralise the preparation of IVAs, reducing waste and saving costs.

Aim and Objectives To evaluate the economic impact of centralising injectable paediatric antifungal drugs in a tertiary hospital CIVAS from January to December 2021.

Material and Methods The cost incurred by the preparation of paediatric antifungals on the wards versus CIVAS was estimated. To do this, data were collected from the electronic prescribing system and the centralised preparation costs were calculated considering the number of vials, diluting agents, extra personnel time (0.90€/preparation) and clothing (0,11€ and 0,16€ in a non-hazardous cabin and hazardous cabin, respectively). Expenses on the ward were calculated based on what it would have cost were they not centralised. These calculations were based on the maximum ex-factory price plus VAT minus a national discount.

Results Three drugs were selected for centralisation, namely liposomal amphotericin B (LAB), micafungin and vorizonazol. Stock solutions were prepared for these drugs at a concentration of 1 mg/mL for LAB and micafungin, and 5 mg/mL for voriconazole, which were then used to prepare different patient specific IVAs. During the time period, a total of 2,423 paediatric antifungals were centralised, which comprised 863 LAB, 1531 micafungin, and only 29 voriconazol IVAs. Saving costs between the ward and the CIVAS were just above 26000€ for LAB, about 72000€ for micafungin, and 250€ for voriconazole, which accounted for a total of 96500€ approximately, considering personnel and clothing costs.

Conclusion and Relevance Centralising antifungal drugs into CIVAS in hospital pharmacies is an efficient measure to reduce waste and costs. This is especially important for highly prescribed paediatric IVAs such as LAB and micafungin, and less so for voriconazole which is far less commonly prescribed in paediatrics, being mainly prepared in CIVAS for safety reasons[1].

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Conflict of Interest No conflict of interest.

4CPS-001 COMPARATIVE ANALYSIS OF TWO PHARMACOKINETIC PROGRAMS FOR LITHIUM ADJUSTMENT

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Background and Importance Therapeutic drug monitoring (TDM) is the clinical practice of measuring drugs to maintain a constant concentration in the patient's blood, thereby individualising dosage regimens. TDM is mainly used to monitor drugs with a narrow therapeutic range, drugs with high pharmacokinetic variability, and drugs with a high incidence of adverse effects.

The narrow therapeutic window of lithium (0.6 – 0.8 mmol/L) requires accurate monitoring of its serum concentrations to achieve a safe and effective therapy.

Aim and Objectives To compare two pharmacokinetic programmes and analyse the precision and accuracy of lithium serum concentration adjustment.

Material and Methods Retrospective observational study including admitted patients with at least one determination of serum lithium concentration between January and December 2020 at a secondary hospital.

Electronic medical records were used to obtain the following data: lithium dosage, serum lithium concentrations, date of blood analysis, serum creatinine, renal function (calculated using the Cockcroft-Gault equation), date of birth, sex and weight.

Serum lithium concentrations were estimated using two pharmacokinetic software programs: MwPharm++ and PKS.

Accuracy and precision were evaluated using Sheiner and Beal's prediction error theory. Accuracy was estimated with the mean prediction error (MPE) and precision with the mean absolute prediction error (MAPE) and the square root of the root mean square prediction error (RMSE). These results are accompanied by 95% confidence intervals.

The statistical significance was determined using a t-student test for comparing means.

Results A total of 79 plasma lithium levels from 18 patients were analysed, 55.6% were male, with a median age of 52.4 years [IQI: 41.7–55.4], and a median weight of 70.5 kg [IQI: 66.8–82.15]. Three patients (16.7%) had a creatinine clearance less than 60 ml/min, and 17 (94.4%) had multiple serum lithium determinations. The median number of determinations per patient were 3 IQI [2–4.5].

The following results were obtained:

Accuracy: MPE 0.02 (-0.025–0.065) and -0.02 (-0.064–0.024) for MwPharm++ and PKS, respectively.

Precision: MAPE 0.14 (0.11–0.18) and 0.12 (0.08–0.16), and RMSE 0.20 and 0.20 for MwPharm++ and PKS, respectively.

No statistically significant differences were found for MPE ($p=0.22$) or MAPE ($p=0.40$).

Conclusion and Relevance MwPharm++ and PKS showed satisfactory predictive capabilities, with no significant statistical differences. Both programs seem to be valid options, but larger studies are needed for confirmation.

REFERENCES AND/OR ACKNOWLEDGEMENTS

Conflict of Interest No conflict of interest.

4CPS-002 PHARMACEUTICAL CARE IN POSTOPERATIVE PAIN MANAGEMENT AT ADMISSION AND DISCHARGE

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Background and Importance The prevalence of pain in postoperative patients is 88.2%, with moderate to severe pain in 19.6% of cases.
Aim and Objectives The objective was to describe pharmaceutical interventions in pain management and the impact on patient-reported pain on admission and discharge and patient satisfaction.
Material and Methods A prospective interventional study (March-May 2023) in hospitalised adult patients admitted in general or trauma surgery was carried out.
Outcome measures patient-perceived pain (VAS) and patient satisfaction.
Pharmaceutical interventions were made 48 and 96 hours after surgery (at bedside) and 48 hours after discharge (by telephone):

1. Admission:

1.1. Reminding nurses of recording VAS (one per nursing shift).

1.2. If VAS≥4, interventions in analgesia prescription and/or in nurse's administration

1.3 Patient education on VAS scale, therapeutic options and the importance of asking for analgesia if pain.

2. Discharge:

2.1. If VAS>2 patients were reminded how to take analgesia. If no analgesia prescribed, the patient was referred to a primary care physician (PCP).

2.2. If they took the prescribed medication and VAS=4–6, they were referred to PCP and if VAS≥7, to the emergency department.

A descriptive analysis was used.
Results Sixty patients were included, mean age of 66.7 (±16.4) years

On admission, 94 interventions were made (92.3% accepted): to encourage VAS recording (n=26), administer analgesia (n=18), prescribe analgesia (n=18), increase therapeutic step (n=17) and patient education (n=15).

An increase in VAS recording was observed (56.7% vs 76.3%). There was a progressive decrease in current patient-reported pain (2.1 vs 1.9 vs 1.4) and maximum pain in last 24 hours (3.2 vs 2.7 vs 2.3) and in the number of patients with VAS ≥4.

At discharge, 39 interventions were performed: 23 patients were reminded how to take the prescribed analgesia, 15 were referred to PCP for lack of analgesia prescription or moderate pain, and one was referred to the emergency department.

Satisfaction with postoperative pain management and the pharmaceutical care was 7.9 (±2.1) and 9.7(±0.5), respectively.
Conclusion and Relevance Pharmaceutical interventions on education, recording, administration and prescription of analgesics might have contributed to a gradual reduction in patient-reported pain. The pharmacist plays a role in the management of postoperative pain during admission and at discharge with high patient satisfaction.

REFERENCES AND/OR ACKNOWLEDGEMENTS
Conflict of Interest No conflict of interest.

4CPS-003 EVALUATION OF CLINICAL VARIABLES IMPACT ON ENOXAPARIN DOSING AND ANTIXA CONCENTRATION

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Background and Importance Monitoring enoxaparin is not routine as per guidelines but is recommended in renal insufficiency and debated for extreme body weights and pregnancy.
Aim and Objectives This study aims to assess enoxaparin monitoring in hospitalised patients and identify variables that correlate with its efficacy.
Material and Methods A descriptive, single-centre, retrospective study was conducted. Hospitalised patients receiving therapeutic enoxaparin doses were included, with measurement of peak anti-Xa concentration between December 2021 and January 2023. Patients undergoing renal replacement therapies were excluded.

Demographic data, laboratory and clinical parameters, and enoxaparin-related details were collected. Obesity was defined as body mass index ≥30 kg/m^2. Multiple linear regression was used to analyse the relationship between anti-Xa concentration and different variables including enoxaparin dose, obesity, renal impairment (ClCr < 30mL/min), and critical status. Suggested peak target range for anti-Xa is 0.5–1.1 IU/mL. STATA/BE was used to assess their correlation with Pearson coefficient and determine the best predictor.
Results A total of 147 patients were included, with a mean ±SD age of 68 years (±12.29), weight of 85.03 kg (±22.92), and a BMI of 29.64 kg/m^2 (±0.61). Among the study population, 64 patients (43.5%) were obese, 15 (10.2%) had renal impairment, and 78 (53.1%) were critical patients. Mean±SD enoxaparin dose was 0.93 mg/kg (±0.13), and no significant differences were observed between obese (0.91±0.15mg/kg) and non-obese (0.95±0.02 mg/kg) populations (p=0.104). Seventy-nine patients (53.7%) presented anti-Xa concentrations out of range; 36 of them (45.6%) were obese.

In the multiple regression analysis, we observed a statistically significant effect of enoxaparin dose (p<0.001) and obesity (p=0.007) in anti-Xa concentrations.

Using the final model, we found a good correlation between anti-Xa concentration and enoxaparin dose (p<0.001). Pearson coefficient of 0.56 was obtained for the non-obese population, while it was of 0.16 in the obese population.
Conclusion and Relevance In our study, we identified obesity as a variable that showed a significant effect on anti-Xa concentration. We confirmed the existence of a linear association between anti-Xa concentration and enoxaparin dose for the non-obese population. For the obese population, a poor correlation between anti-Xa concentration and enoxaparin was found suggesting the need for monitoring due to less predictable pharmacokinetics.

REFERENCES AND/OR ACKNOWLEDGEMENTS
Conflict of Interest No conflict of interest.

4CPS-004 IMPACT OF INADEQUATE EMPIRICAL THERAPY ON THE MORTALITY RATE IN PSEUDOMONAS AERUGINOSA INFECTIONS

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Background and Importance The appropriate use of antibiotics and their clinical impact is a necessary field of study to address the high incidence of resistance.