Background and importance Patients hospitalised in intensive care units (ICUs) often require the use of multiple drugs, and the intravenous (IV) route is the most common mode of administration. IV access is usually limited, leading to concomitant administration of different drugs in the same infusion line. A previous work[1] identified many administrations via a Y site without compatibility data. A list of missing data was established.

Aim and objectives From this list, we decided to evaluate the physical compatibility of two drugs frequently administered (acetylsalicylic acid and atenolol) with other drug used in ICUs by visual tests, subvisual tests and pH measurement.

Material and methods Each pair of drugs was mixed in three ratios (drug A/drug B: 9/1; 5/5; 1/9). Visual analysis, such as precipitation formation, colour change, gas formation, subvisual evaluation by UV spectrophotometry at 350, 410 and 550 nm, and pH measurements were performed for each mixture.

Results A total of 17 pairs of two drugs were tested: 10 mixtures with acetylsalicylic acid and seven mixtures with atenolol. For the mixtures with acetylsalicylic acid, eight were compatible pairs and two were incompatible pairs: acetylsalicylic acid with canreonate potassium (precipitate formation) and with Nutryelt (colouring in pink). For the mixtures with atenolol, five were compatible pairs and two were incompatible pairs: atenolol with mycophenolate (appearance of haze) and with Nutryelt (colour change).

Conclusion and relevance After laboratory tests, new incompatibilities were found which gives additional information to the literature. This study demonstrated that all mixtures were compatible except for acetylsalicylic acid with canreonate potassium and Nutryelt, and atenolol with mycophenolate and Nutryelt. However, many other mixtures should be studied due to missing data.

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Conflict of interest No conflict of interest

3PC-071 FULLY AUTOMATED CENTRAL INTRAVENOUS ADDITIVE SERVICE (CIVAS): A 12 MONTH ANALYSIS OF PERFORMANCES AND IMPACT OF COVID-19 ON STERILE ANTIBIOTIC PRODUCTION

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Background and importance In 2014, the hospital pharmacy started a project to implement a central intravenous additive service (CIVAS) unit. A pre-feasibility study was performed, a new class C clean room equipped with the robotic system APOTECA unit was built and the fully automated aseptic production process was validated. In 2016, the CIVAS started producing standard doses of chemotherapy supportive treatments (palonosetron, ondansetron, dexamethasone) in ready-to-administer form for the oncology and haematology units. The production was then shifted to antibiotics (cefazolin, piperacillin–tazobactam, ceftriaxone) and pantoprazole for infectious disease, cardiac surgery and emergency medicine departments. Currently, the in-advance production of batch preparations at CIVAS is mainly based on daily consumption and performed by one pharmacy technician and one pharmacist (0.25 full time equivalent each). The working day is from 8am to 4pm (Monday–Friday).

Aim and objectives The aim of this study was to analyse the performance of the CIVAS over the past year and evaluate the impact of the COVID-19 pandemic on the increasing demands for sterile antibiotics by emergency departments.

Material and methods Overall CIVAS production, dosage accuracy and average production time (APT) of each ready-to-administer preparation were evaluated over a period of 12 months (from September 2019 to August 2020). Data were collected from the APOTECA statistical tool.

Results 12 215 preparations were compounded, of which 26% were in syringe (1 g cefazolin, APT 125 s) and 74% in 100 mL NaCl 0.9% infusion bags (55% for 4.5 g piperacillin–tazobactam, ATP 203 s; 14% for 40 mg pantoprazole, ATP 196 s; 5% for 2 g ceftriaxone, ATP 177 s). Average dosage accuracy for all preparations was 98.9±1%. During the peak of Italy's COVID-19 outbreak (March 2020), weekly production increased by 28%. The production of pantoprazole remained steady, while piperacillin–tazobactam and ceftriaxone for the emergency departments increased considerably (+19% and 9%, respectively) and cefazolin for the cardiac surgery department decreased by 26%.

Conclusion and relevance Implementation of a fully automated CIVAS allows measuring and controlling every step of the production process for ready-to-administer preparations. The study showed that CIVAS met increasing demands for sterile antibiotics during the pandemic crisis, thereby supporting the emergency units and providing the highest level of quality and safety.

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3PC-072 WHICH MODEL TO ESTIMATE AT BEST THE THEORETICAL OSMOLARITY OF NOMINATIVE PARENTERAL NUTRITION?

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Background and importance Osmolarity is one of the pharmaceutical controls carried out on the nominative parenteral nutrition (NPN) compounded at the hospital pharmacy. A previous validation method for calculation of the theoretical osmolarity of standardised parenteral nutrition (SPN) was extrapolated to NPN. Osmolarity was determined using the Pereira Da Silva equation[1] (PDS) when osmolarity is >1453 mosmol/L, or the manufacturer's data (MD) equation, which is the addition of the different osmolarities of the components. After 2 years, a non-conformity osmolarity rate of 8.9% was observed.

Aim and objectives The aim was to determine the best model to calculate the theoretical osmolarity of the NPN to decrease the non-conformity rate.

Material and methods A retrospective analysis of the NPN osmolarity values was performed on the last 27 months'

production. Mean relative errors (MRE) between the theoretical osmolarities calculated with the PDS and MD equations and the measured osmolarity were compared using a Student's t test. NPN was divided into seven ranges according to the osmolarity measured by freezing point depression with the OsmoPro osmometer (Advanced Instruments).

Results 2572 NPN were analysed. Osmolarities were distributed as follows: 1.7% from 500 to 749 mosmol/L, 19.6% from 750 to 999 mosmol/L, 25.5% from 1000 to 1249 mosmol/L, 18.4% from 1250 to 1499 mosmol/L, 15.5% from 1500 to 1749 mosmol/L, 15.3% from 1750 to 1999 mosmol/L and 4.0% over 2000 mosmol/L. Between 500–749 and 750–999 mosmol/L, the MRE of osmolarities were similar with both equations (p=0.99 and p=1). However, there was a significant difference in MRE in favour of the PDS equation between 1000 and 1249 mosmol/L (p=0.027), 1250 and 1499 mosmol/L ($p=6.5\times10^{-45}$), 1500 and 1749 mosmol/L ($p=2.4\times10^{-12}$), 1750 and 1999 mosmol/L ($p=2.05\times10^{-129}$) and over 2000 mosmol/L ($p=1.66\times10^{-36}$).

Conclusion and relevance From 500 to 999 mosmol/L, both equations can be used to predict NPN osmolarities. For NPN with osmolarities from 1000 to over 2000 mosmol/L, the PDS equation was significantly more accurate. Therefore, the actual theoretical osmolarity calculation method should be revised in favour of the MD equation for NPN with osmolarities <1000 mosmol/L and the PDS equation for NPN with osmolarities >1000 mosmol/L.

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3PC-073 EVALUATION OF ANTIBIOTICS' PHYSICOCHEMICAL INCOMPATIBILITY WITH THE PRESENCE OF DIVALENT CATIONS

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Background and importance The sensitivity of drugs to dietary influences largely depends on their physicochemical properties. Interactions between drugs and foods may induce a change in the physicochemical and pharmacological properties of the active ingredient, such as its bioavailability and toxicity.

Aim and objectives To determine the physicochemical incompatibility of the active ingredient (AI) of some antibiotics in the presence of divalent cations found frequently in our daily diet or in patients using parenteral nutrition at the hospital.

Material and methods We selected nine active ingredients of the most commonly used antibiotics at the hospital, mixed separately with four divalent cations. The mixtures were made by introducing the components in an equivalent amount into test tubes. The tests were carried out under two conditions: (1) ambient temperature and (2) after heating and acidification of the mixtures with HCl. 90 AI/cation mixtures were made and analysed after 1 hour. The physicochemical properties previously established for both the active ingredients and the cations were compared with the new data using UV visible spectroscopy.

Abstract 3PC-073 Table 1

	Ambient temperature				After heating and acidification			
	Ca^{2+}	FE^{2+}	MG^{2+}	ZN^{2+}	Ca^{2+}	FE^{2+}	MG^{2+}	ZN^{2+}
Trimethoprim	-	++	-	-	+	+++	+	-
Amoxicillin trihydrate	-	-	-	-	-	+	-	-
Spiramycin	-	-	-	-	-	+	-	-
Sulfamethoxazole	-	-	-	-	-	+	-	-
Metronidazole	-	-	-	-	-	+	-	-
Ciprofloxacin	-	++	-	+	-	+++	-	+
Tetracycline	++	-	-	-	+	+	-	-
Azithromycin	-	-	-	-	-	+	-	-
Cefixime	-	++	-	-	-	+++	-	+

-, no visual interaction ; +, presence of precipitate ; ++, change colour ; +++, change colour with presence of precipitate.

Results Results are represented in table 1.

Conclusion and relevance Compatibility data with oral or parenteral nutrition is often missing for most of the frequently used drugs requiring a case-by-case assessment. The clinical pharmacist's understanding of physicochemical and pharmacological phenomena related to drug and food incompatibilities is a useful resource in the management and prevention of this problem.

REFERENCES AND/OR ACKNOWLEDGEMENTS

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Section 4: Clinical pharmacy services

4CPS-217 NETUPITANT–PALONOSETRON IN BREAST CANCER: POTENTIAL DRUGS INTERACTIONS

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Background and importance Neurokinin-1 (NK1) receptor antagonist (RA), netupitant, is usually co-administered with the serotonin (5-HT_3) RA, palonosetron, to prevent chemotherapy induced nausea and vomiting.

Aim and objectives To analyse potential drug interactions (PDI) between netupitant–palonosetron (NEPA) with breast cancer treatment.

Material and methods This was a retrospective observational study including all patients who started with epirrubicine and cyclophosphamide in a third level hospital from January to August 2020 (8 months). At the beginning of treatment, the pharmacist reviewed the medication during the pharmaceutical consultation. PDI were identified using Micromedex, Uptodateintreactions, Medinteract (Spanish Society of Hospital Pharmacy) and Drug Interaction checker (Food and Drugs Administration).