

# CENTRALIZED IV COMPOUNDING: A PRE-FEASIBILITY STUDY ON CLINICAL PRACTICE

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## BACKGROUND AND PURPOSE

In clinical practice, intravenous injectable drugs (IV) are typically administered after extemporaneous reconstitution and preparation performed by nurses. This process can lead to undetected medication errors and microbial contamination. CIVAS Unit (Central Intra Venous Additive Services), centralized production facility that satisfies

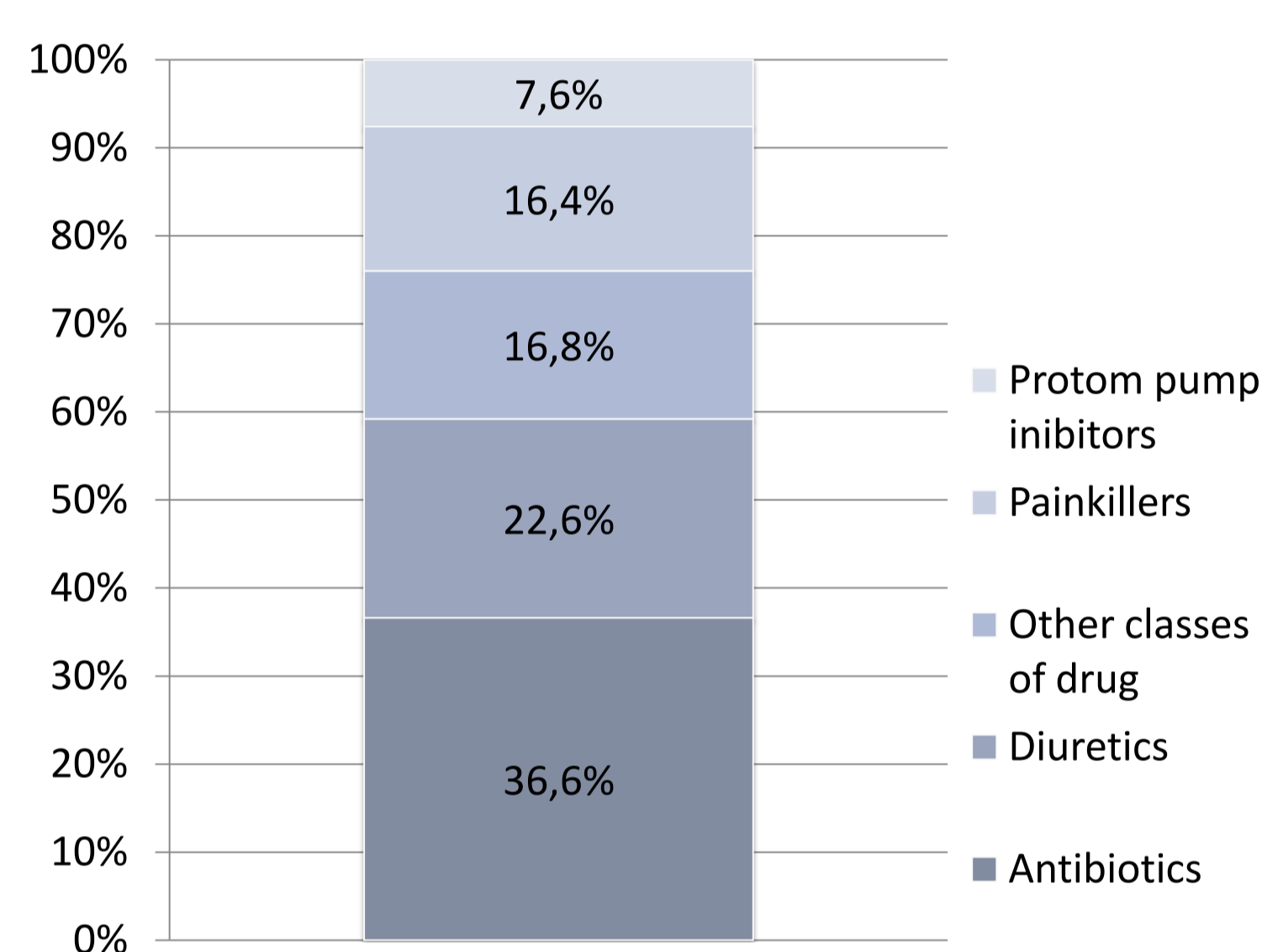
the quality and safety requirements of sterile medications, is a key solution developed to improve the safety of this process. This work represents a preliminary study to investigate the prescribing habits of different departments as a first step in the goal to centralize and automate the IV production process.

## MATERIAL AND METHOD

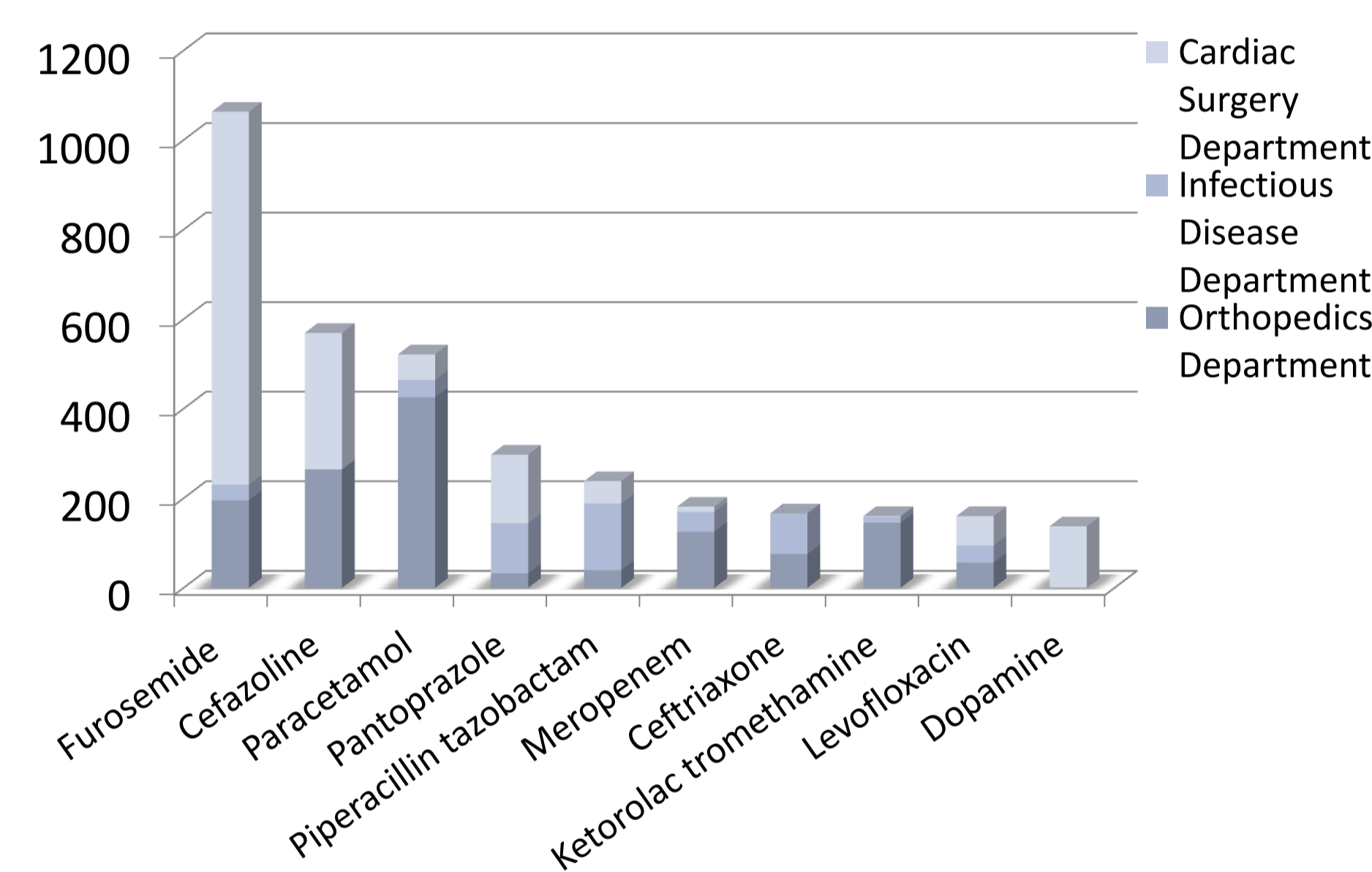
All medical records of patients admitted in June 2014 to different clinical departments (Orthopaedics, Infectious Diseases Division, Cardiac Surgery Department) were inspected. All the intravenous therapies were examined, focusing on class of drug, molecules prescribed, related dosage, dilution, posology and chemical stability.

## RESULT

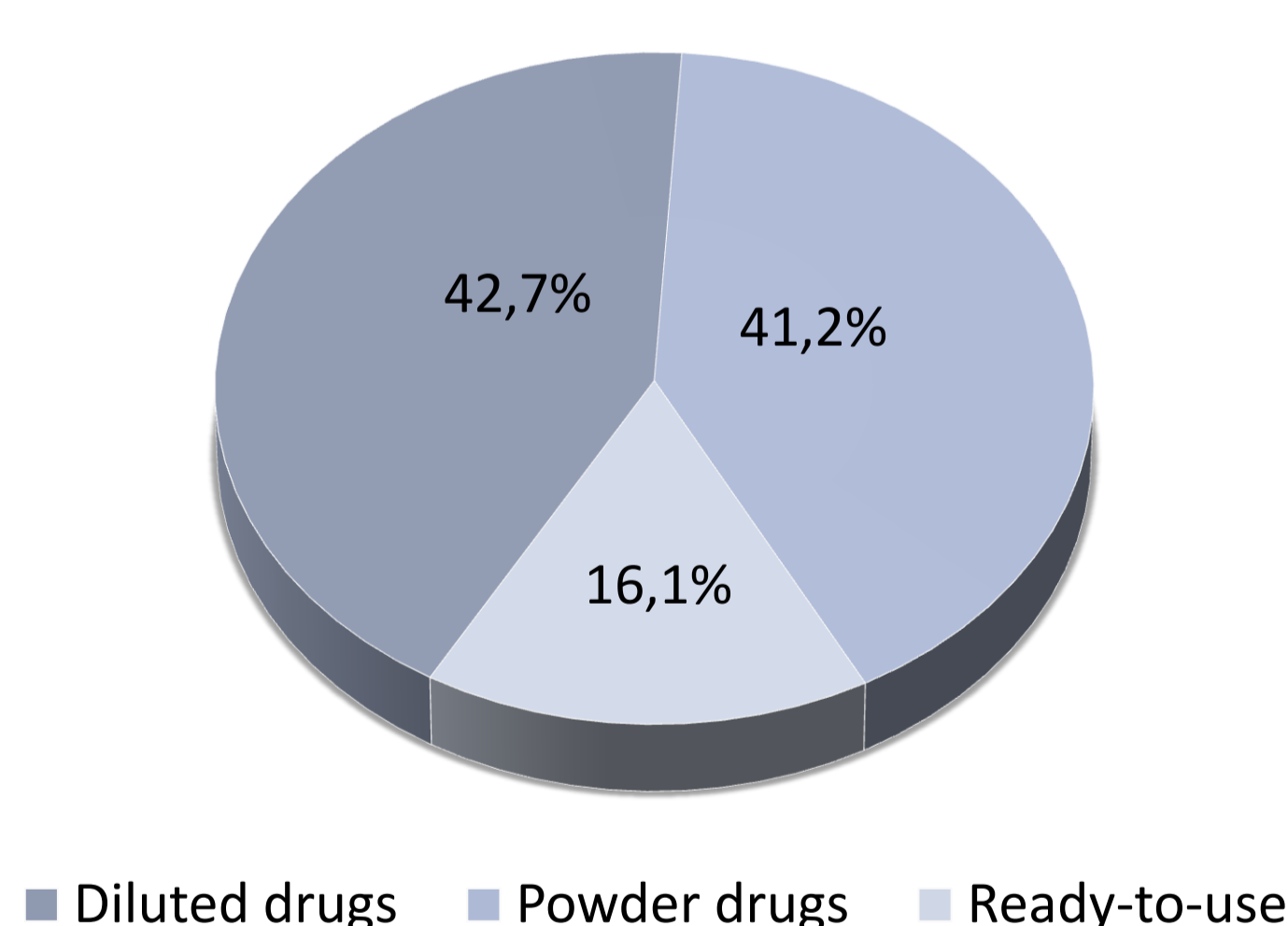
Within this sample 5285 intravenous administrations were prescribed to 266 different patients (144 Orthopedics, 38 Infectious Disease, 84 Cardiac Surgery). Antibiotics were the most commonly prescribed class (36.6%), followed by diuretics (22.6%), painkillers (16.4%) and proton pump inhibitors (7.6%). Of these administrations, 16.1% were commercially available in ready-to-use formulations, while 42.7% were available in solution for injection, and 41.2% as powder drugs for reconstitution. Most of these drugs are compounded before the administration with a bag as a final container (90.9%), while the remaining 9.1% were administered in a syringe. The medications consisted of 84 different active ingredients. Of these, 20 molecules represented 83% of total administrations with Furosemide (20.1%) being the most utilized, followed by Cefazoline (10.7%) and Paracetamol (9.8%). Dosages are mainly standard and single with some exceptions. For example, Furosemide is available in 4 different dosages. Comparing international scientific studies and official data, the ten most common medications show a stability longer than 24 hours, ranging from 24 hours to 10 days.



The most used class of drugs prescribed



The most used active ingredients in the three departments



Drugs dilution

Drugs	Strenght	Stability	Reference
Furosemide	10 mg/ml	84days (protect from light)* 7days (not protect from light)*	Stabilis
Cefazoline	100mg/ml	30days (protect from light, 5°)	Stabilis
Paracetamolo	10mg/ml	84hours	Stabilis
Pantoprazole	0,4mg/ml	3days (20°-25°) 28days (2°-8°)	Stabilis

\* Data considering: 1.2-3.2 mg/ml as strenght

## CONCLUSION

The goal of centralizing and automating the IV production is reasonable and promising given that the most used molecules are

limited in number and utilized in a standard way. Moreover, drug stability demonstrate the feasibility of centralized production

in advance and creating a dedicated storage. Next steps include the evaluation of economic aspects.