

MEDICATION DISCREPANCIES AT THE TIME OF ADMISSION TO AND TRANSFER FROM THE INTENSIVE CARE UNIT (ICU) AND THE ROLE OF A CLINICAL PHARMACIST.

Van Kemseke S.¹, Huyghens L.², Collier H.¹, Cortoos P-J.¹, Ligneel C.¹

¹: Pharmacy Department, University Hospital Brussels, Brussels, Belgium; ²: Intensive Care Unit, University Hospital Brussels, Brussels, Belgium

BACKGROUND AND OBJECTIVE

- **Medication discrepancies** (differences between actual and documented therapy) often **arise at patient transfer** between wards: **50% of medication errors (ME)** occurs at the time of admission or discharge [1].
 - Intensive Care Unit (ICU) patients are at **increased risk** for MEs and Drug Related Problems (DRPs) [2], because of:
 - ✓ Polymedication
 - ✓ Frequent therapy changes
 - ✓ Sedation, impaired consciousness
- ➡ Increased morbidity, mortality and cost
- **Objective:** to determine the **type and frequency of medication discrepancies and DRPs** on time of admission, during stay on ICU and on transfer to the ward.
- ➡ **What is the potential role of a clinical pharmacist?**

SETTING AND METHODS

Setting

- **Prospective before-after study**
- **Tertiary care university hospital**
- **General & cardiology ICU:** 12 beds in total
- **Inclusion criteria:** adult patients with informed consent



Methods

- A clinical pharmacist conducted:
- **On admission:** standardized **medication reconciliation and review**
 - **During ICU stay:** **twice weekly drug review**
 - **Upon transfer:** **final review** of patient therapy
- Statistical analysis: Graphpad Prism®



Observation

- **8 weeks:** 10/2015 – 01/2016
- Pharmacist: **passive observation** on ICU
- **Defining and documenting DRPs** (interactions, wrong route, wrong dose, lack of information...) and **discrepancies** between physicians' notes and prescriptions



Intervention

- **16 weeks:** 01-05/2016
- Pharmacist: **active participation** in multidisciplinary team on ICU
- **Entering compiled drug histories** in patient file
- **Participation in clinical rounds**
- **Proactive feedback**



RESULTS

1. Population

- **111 patients** were included (observation period: 50; intervention period: 61).
- There was **no significant difference** between both groups (Table 1).

Table 1. Patient characteristics

	Observation period (n=50)	Intervention period (n=61)	P-value
Gender (male)	29 (58%)	35 (57.4%)	0.95*
Median (IQR) age (years)	67 (59-77)	64,3 (57.3-75,1)	0.67**
Patients included	50 (40%)	61 (37%)	0.93*
Median (IQR) length of stay ICU (days)	3 (2-8.25)	5 (3-11.5)	0.062**
Median (IQR) length of stay hospital (days)	15 (7-34.5)	15,5 (9-26.25)	0.97**

*Chi² - test, **Mann-Whitney test

2. Admission & stay on ICU

- **Medication reconciliation of patient home therapy:** significant difference in number of drugs when performed by the **physician compared to the pharmacist** (observation vs. intervention period; both $P < 0.0001$, Table 2).

Table 2. Medication reconciliation of patient home therapy.

	Observation period (n=50)		Intervention period (n=61)	
	Doctor	Pharmacist	Doctor	Pharmacist
Total number of drugs	295	421	401	501
Median (IQR) drugs/patient	5.5 (2-9)	8.5 (5-12.25)	6 (4-9.5)	8 (4-9.5)

- **7,6% of all medication** (32/421) in patients' home therapy contained a **DRP** during observation and **8,1%** during intervention (41/501).
- For both observation- and intervention period, **56,3% of all medication** in patients' home therapy (255/453 vs. 311/552), performed by the physician, contained a **discrepancy**. Most important type of discrepancies (Figure 1):

- 1) Omission
- 2) Aberrant dose
- 3) Addition/aberrant frequency

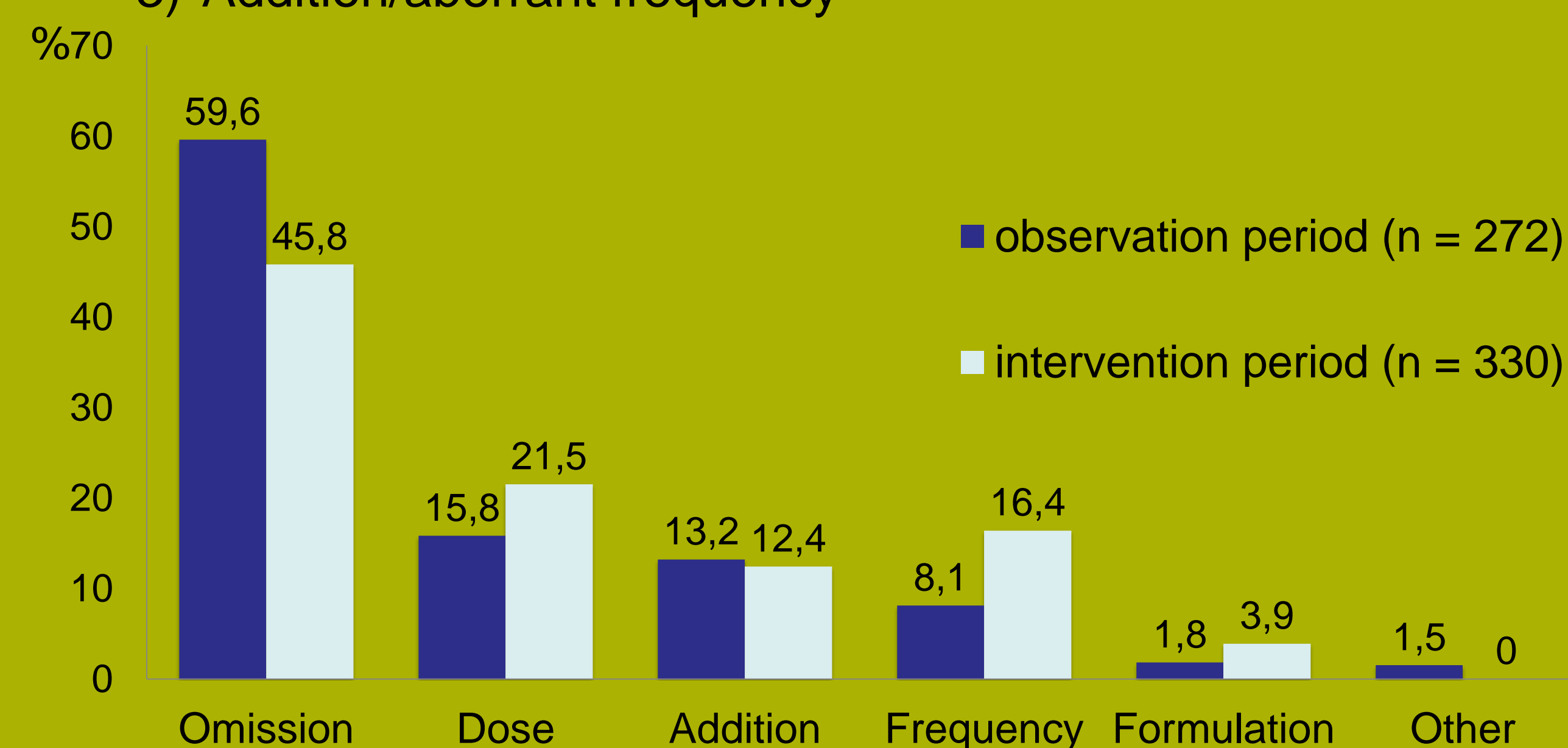


Figure 1. Type of discrepancies in the patients home therapy

- During the intervention period we saw a non-significant reduction in DRPs during stay on the ICU (5/patient vs. 3/patient; $P = 0.06$).

3. Transfer

- During the intervention period, there was a **drastic reduction in median number of discrepancies** (1(0-2) vs. 0(0-1); $P = 0.0067$). Most important **type** of discrepancies were (Figure 2):

- 1) Drug omission
- 2) Wrong dosing frequency
- 3) Drug addition/wrong dose

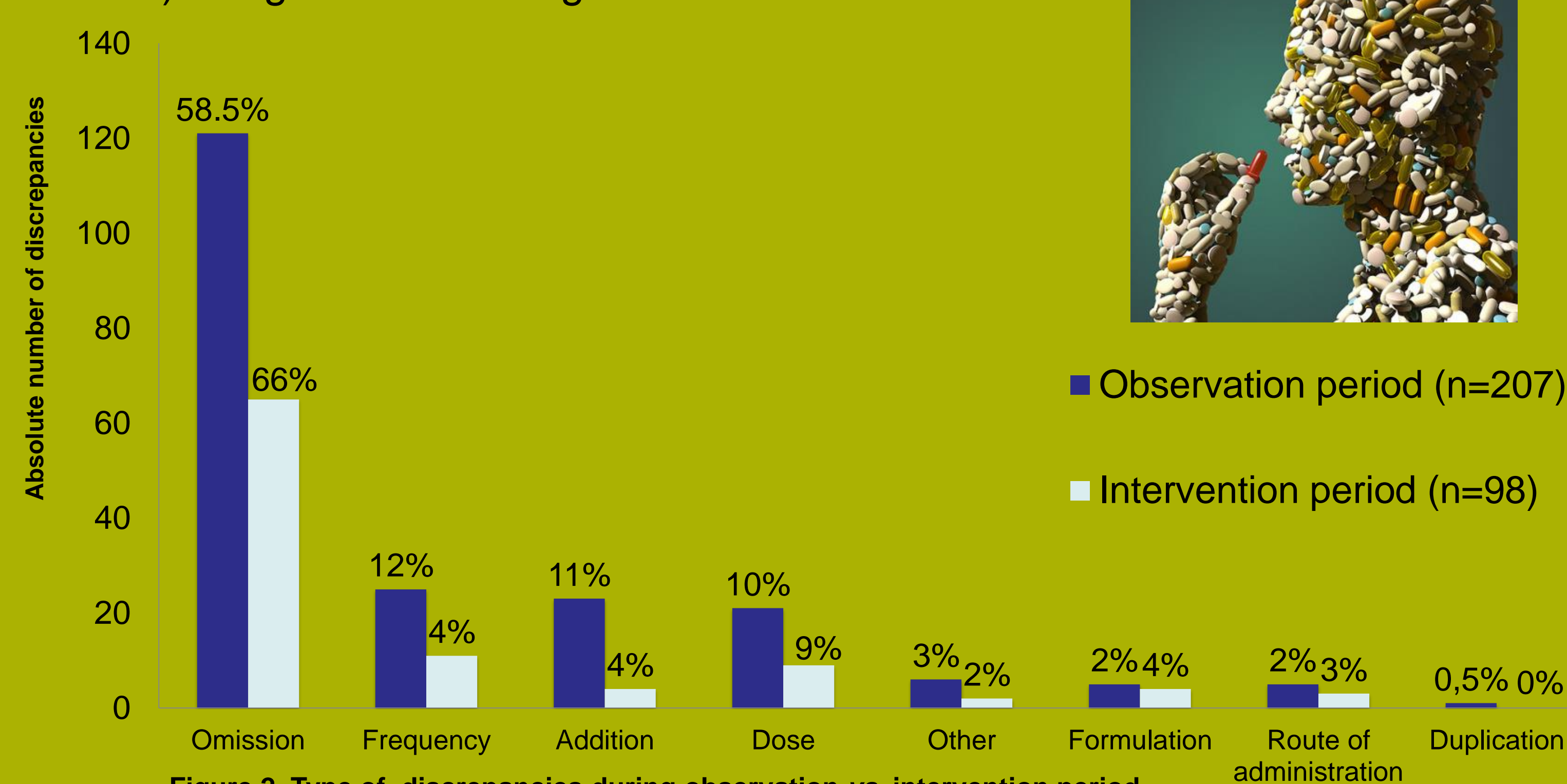


Figure 2. Type of discrepancies during observation vs. intervention period.

- During the intervention period, there was also a **reduction in median number of DRPs** (3 (1-5) vs. 1 (0-2.5); $P = 0.0009$) at the moment of transfer. There was a similar reduction of transfer discrepancies due to **incomplete drug reconciliation** (17.9% vs. 5.1%; $P = 0.0061$), which was the most important **DRP** during the observation period.
- Other important DRPs were **absent therapy duration** (23 vs. 30%), an **improper route of administration** (21 vs. 19%) and the **lack of information** in patient file (10 vs. 4%)

4. Interventions

- During the intervention period, the pharmacist performed a total of **683 interventions** out of which **92,7%** were **accepted** by the physician.
- A median of **6 (IQR 3-10.5) interventions per patient** were done.
- Most important intervention (**48,8%**) was **medication reconciliation** where the pharmacist corrected discrepancies in the home therapy of the patient (Figure 3).

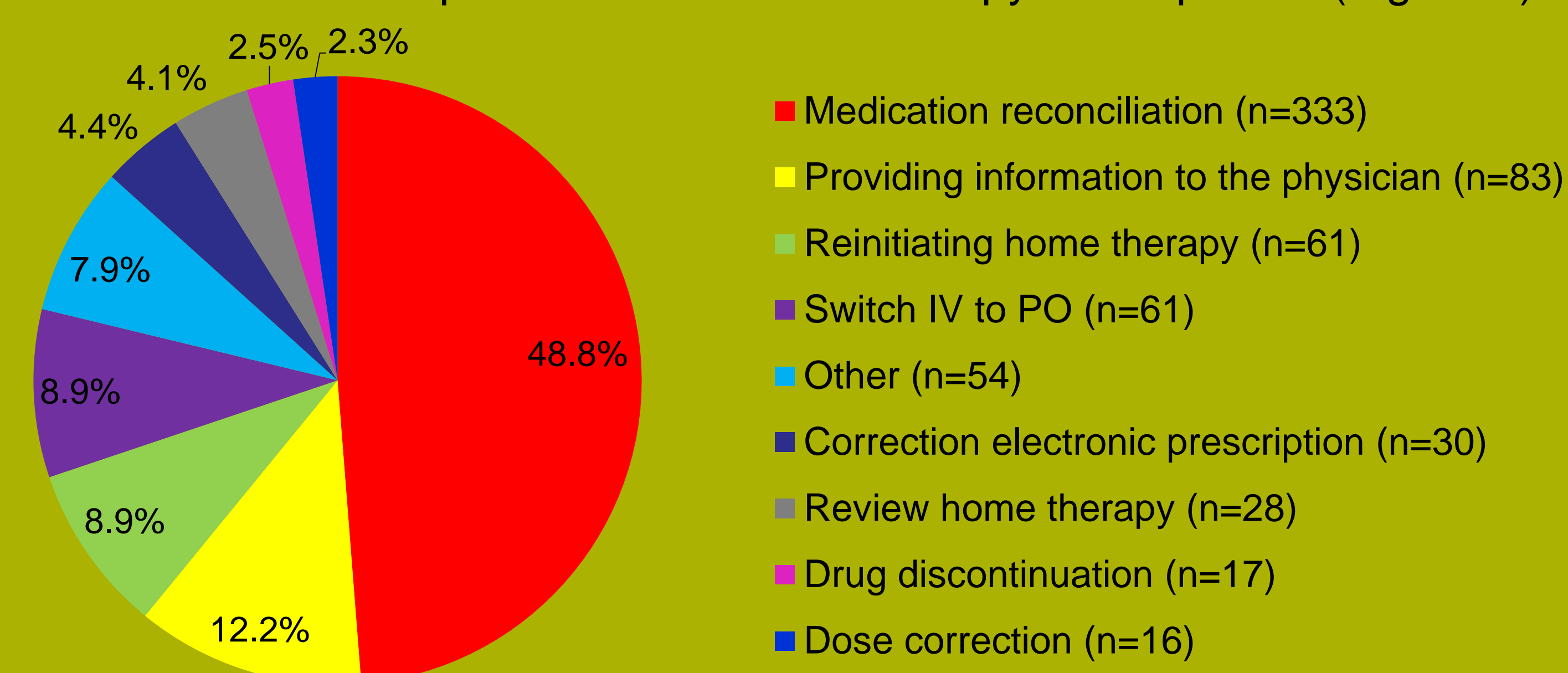


Figure 3. Type of interventions performed by pharmacist

CONCLUSION

A **clinical pharmacist**, integrated in a multidisciplinary ICU team, can make a **significant contribution to medication safety** by:

1. **Preventing discrepancies** in the chronic medication on admission.
2. **Identifying DRPs** and subsequently avoiding medication errors and/or ADEs.
3. **Reducing discrepancies** on transfer from ICU to a normal ward.



REFERENCES

- [1] Pronovost et al. J Crit Care 2003;18(4):201-205.
 [2] Lenander et al. Scand. J. Prim. Health Care 2014;32(4): 180-186.

Contact: Saskia.VanKemseke@uzbrussel.be

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