

# ESTIMATION OF DISPENSING ERRORS MADE BY NURSES IN AN EXPERIMENTAL PHARMACY

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## INTRODUCTION

Medication error is a major problem source when dispensing drugs, with the eventual risk of causing harm to the patient and a possible increase in morbidity, length of stay and hospital costs. Drug dispensing is a complex manual process giving rise to numerous difficulties, such as ergonomic problems, reconstitution, look alike and sound alike products. Drug dispensing is also a critical stage because a final control of the prepared products is not always possible.

The **aim** of this study was to estimate the importance (frequency, type) of both dispensing and calculation errors made by nurses during the preparation of oral treatments in the ward pharmacy.

## METHOD



Fig. 1 : The experimental pharmacy

To simulate real conditions, an experimental pharmacy (Fig. 1) supplied with a standard stock was created in an empty ward. Thirty voluntary nurses (24 females and 6 males) from both the medical and surgical departments were enrolled in the study. The undisturbed experience, which lasted for one hour, was divided into two stages:

- \* Preparation of 20 pill boxes containing 4 different prescribed drugs with various administration regimens. (80 drugs, 146 doses) (Fig 2).
- \* Resolution of 10 straightforward calculations (conversions, dilutions ...) that are typical in this kind of work. (Fig 3).

D	8 h	12 h	16 h	20 h
Madopar 250 mg		1		1
Buspar 10 mg	1			1
Akineton 2 mg	1			1
Corgard 60 mg	1			

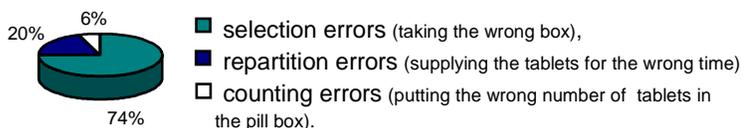
Fig 2: Example of prescription set

- Ciprofloxacin 0.2 g / 100 ml  
Prescription : 400 mg every 8 hours iv
  - How many ml do we need for one administration?
  - If the perfusion must pass over 2 hours, what is the flow in ml/h?
  - With 18 bottles, how many days can we continue the treatment ?

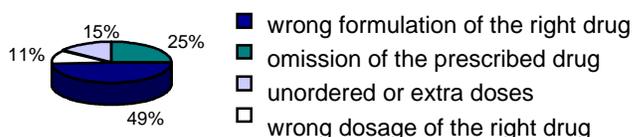
Fig. 3 : Calculation example

## RESULTS

The mean error throughout the **dispensing** was **3 %** (SD 2.4). The different kinds of errors were as follows :



➔ The **potential consequences** resulting from the administration of dispensed treatments to the patients would have been:

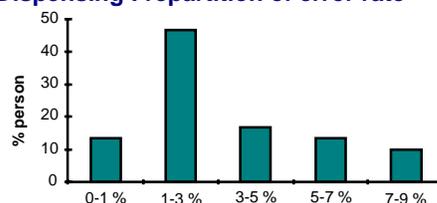


Wrong answers in the **calculation stage** were obtained in **22 %** of cases, right answers in 73 % and no answer in 5 %.

Half of the nurses made more than 23 % of wrong answers.

No significant differences were detected between male, female, medical or surgical nurses during the study period.

### Dispensing : repartition of error rate

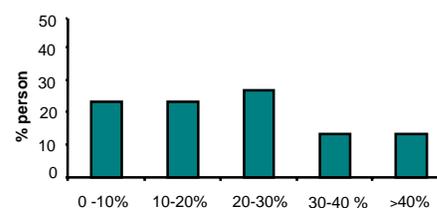


### Example of a selection error (look alike drugs)



Left : Madopar DR (levodopa/benserazide)  
Dual Release Form  
Right : Madopar (levodopa/benserazide)  
Normal formulation

### Calculation: repartition of wrong answers



## CONCLUSIONS

The results confirm a high error frequency during dose calculation and dispensing. These results are in agreement with other studies that evaluated the error rate during real observation in the wards (Schmitt E. Le risque médicamenteux nosocomial.1999). Even though the nurses considered that the experimental conditions were very similar to those habitually encountered in reality, a direct extrapolation of error rate is difficult. This is particularly due to the fact that the nurses were left undisturbed and this may probably lead to an under-estimation of the real situation. This pilot study permitted the validation of the experimental model. A large scale study will be carried out in the future to measure the influence of several factors including labelling, pharmacy structure and processes on the error rate.