

Study of particle contamination in activity areas dedicated to the automated preparation of doses to administer (APDA)

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1 INTRODUCTION

Hospital Pharmacy of Verdun Saint-Mihiel carries out Automated Preparation of Doses to Administer (APDA) for approximately 80% of patients. Two previous studies have highlighted a potential risk of chemical exposure of personnel to medicinal dusts and the production of particles during PDAA activity. The rooms dedicated to this activity currently benefit from collective protection systems: dust extraction modules connected to the automatons and extractor hood for the deconditioning stage.

- To compare the particulate concentrations obtained in the APDA rooms with a reference value within the Hospital Pharmacy
- To assess the effectiveness of the collective protection systems installed in the APDA rooms

Dual purpose

2 METHOD

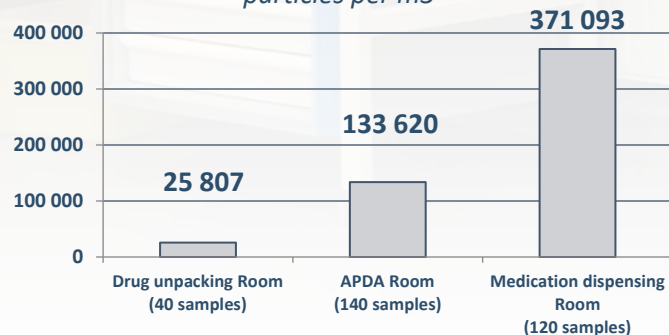
- Performing a particle count in accordance with standard NF EN ISO 14644-1
- Samples :
 - With a discrete particle counter «Lighthouse worldwide solutions HH3016» : 3 cycles of 1 minute per point
 - Number of sampling points per room = $\sqrt{\text{room surface}}$
 - APDA room : 7 points ; Drug unpacking room : 4 points ; Medication dispensing room : 8 points
 - During activity
 - With and without collective protection systems for APDA and Drug unpacking Rooms
- Result in number of suspended particles per m3: comparison of averages obtained by applying statistical tests



3 RESULTS

1st objective : comparison of average concentrations in different rooms

Average concentrations of suspended particles per m³



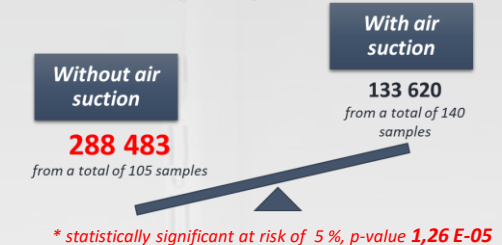
Significant differences between the dispensing room (= reference room, absence of unpacking and APDA activities) and :

- APDA room
 $\alpha = 5\%$, $p\text{-value} = 3,38 E-08$
- Drug unpacking room
 $\alpha = 5\%$, $p\text{-value} = 2,42 E-09$

2nd objective : comparison of concentrations obtained with and without an air suction

APDA	Comparison point per point with/without an air suction						
	1	2	3	4	5	6	7
Sample point							
Demonstration of a significant difference	✓	✓	✓	✓	✓	✓	✓

Comparison of the average concentration of suspended particles per m³ *



Drug unpacking	Comparison point per point with/without an air suction			
	1	2	3	4
Sample point				
Demonstration of a significant difference	✓	✓	✓	✓

Comparison of the average concentration of suspended particles per m³ *



4 DISCUSSION AND CONCLUSION

- ❑ Higher average concentration of suspended particles in the dispensing room
 - ➔ No overexposure to dust demonstrated in work rooms dedicated to APDA
- ❑ Lower average concentration of suspended particles when the systems are active: at any sampling point, the maximum particle concentration with the suction system remains lower than the minimum concentration without the suction system
 - ➔ Effectiveness of collective protective equipment
 - ➔ Healthy investment to improve staff safety