

Background and objectives

In December 2023: a study evaluating **professional exposure** to systemic anti-cancer drugs (SACDs) was conducted:

- Participants: pharmacist of the Cytotoxic drug Reconstitution Unit (CRU), pharmacy technician, occupational health department
- Location: hospital pharmacy
- Results: **environmental contamination** with SACDs, both inside and outside the CRU
- Assumption: contamination during the **disposal of waste** outside the CRU

The objective of this study was to reduce the risk of environmental contamination by SACDs using the **FMECA** (Failure Mode, Effects, and Criticality Analysis) method.

Materials and methods

This study was conducted in 5 steps:

1. Reviewing the CRU’s waste disposal procedures
2. Observing current practices
3. Conducting the **Five Whys** checklist (Who, What, When, Where, Why) to assess current practices
4. Collectively reviewing the checklist with a **Multidisciplinary Discussion Group** (MDG) consisting of the concerned staff members
5. Conducting a **FMECA** method to :
  - Identify high-risk practices
  - Prioritize them → calculating criticality: Severity x Frequency x Controllability (value [1 ; 64], determined in the MDG)
  - Establish **corrective action plans** with the MDG

Results

- An assessment of practices regarding the CRU’s waste disposal was conducted:  
→ We identified **high-risk practices** of environmental contamination

Results of FMECA :

| Process | Subprocess | Failure modes | Causes of failure | High-criticality causes ( <u>≥ 12</u> ) | Corrective action plans                         |
|---------|------------|---------------|-------------------|-----------------------------------------|-------------------------------------------------|
| 3       | 11         | 18            | 23                | 17                                      | 6 (target 100% of causes with criticality ≥ 12) |

Example :

| Process         | Subprocess             | Failure modes                    | Effect                                                                                                                                                                                               | Criticality | Corrective action plans                                                                                                                                                                     |
|-----------------|------------------------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Waste logistics | Disposal of DASRI bags | DASRI bag handled without gloves | Risk of hand contamination by SACDs: <ul style="list-style-type: none"><li>- Pharmacy technician exposure</li><li>- Risk of pharmacy’s surfaces contamination (inside and outside the CRU)</li></ul> | 12          | <ul style="list-style-type: none"><li>- New practices (appropriate wearing of gloves...)</li><li>- New trolley better suited to logistics</li><li>- Pharmacy technician awareness</li></ul> |

- New practices for waste disposal from the CRU were implemented, and existing procedures were revised
- **Posters** (image 1) now remind staff of the handling rules to follow, and new equipment (adapted cart...) has been made available to the staff.

Discussion and Conclusion

Following the identification of a **potential risk exposure to SACDs** for hospital pharmacy workers, an analysis of the CRU’s waste disposal process was conducted as part of the continuous quality improvement initiative. This analysis, carried out in collaboration with a **multidisciplinary team**, led to changes in practices and increased awareness on this issue. Now that the new measures are implemented, it will be necessary to reassess staff exposure risks (using the FMECA method) and the **environmental contamination** through new sampling campaigns.



Image 1 : Poster available in the CRU reminding people of the rules for handling waste