

# Bulletin de veille n° 66

**1<sup>er</sup> mars 2024 – 30 avril 2024**

## **Surveillance biologique de l'exposition professionnelle aux médicaments cytotoxiques.**

### **Etude de terrain.**

Objectif : *Disposer d'une connaissance actualisée du sujet en accompagnement des demandes d'assistance qui découlent de la valorisation de l'étude sur la surveillance biologique de l'exposition aux médicaments cytotoxiques en milieu hospitalier.*

*La validation des informations fournies (exactitude, fiabilité, pertinence par rapport aux principes de prévention, etc.) est du ressort des auteurs des articles signalés dans la veille. Les informations ne sont pas le reflet de la position de l'INRS. Les éléments issus de cette veille sont fournis sans garantie d'exhaustivité.*

*Les liens mentionnés dans le bulletin donnent accès aux documents sous réserve d'un abonnement à la ressource.*

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- **Articles de périodique (PREPRINT)**

Sharp L., Fransson P., Fowler M., Ullgren H.

**Aspects of occupational safety: a survey among European cancer nurses.**

European Journal of Oncology Nursing, 18 avril 2024

Résumé : *PURPOSE: Nurses are particularly at risk for occupational exposure to hazardous cancer drugs, risking both acute and chronic health effects. Knowledge on the implemented safety precautions into minimizing these risks is limited. METHODS: The European Cancer Nursing Index (ECNI) was developed by the European Oncology Nursing Society (EONS) to illustrate the development and status of this profession. In this study, anonymous online survey data on occupational safety reported by European cancer nurses as part of the ECNI 2022, was analysed. RESULTS: A total of 630 cancer nurses from 29 countries responded to the survey. A majority reported that written guidelines (n = 553, 88%) on safe handling and administration of hazardous drugs, personal protection equipment (PPE) and cytotoxic spillage kits (n = 514, 82%) were available at their workplaces. 130 (21%) nurses reported that wipe testing to assess any residual hazardous drugs on workplace surfaces were conducted systematically at their workplaces. 185 (29%) nurses reported that nurses sometimes or always continued with their regular tasks (including handling hazardous cancer drugs) during pregnancy and breast feeding. 185 (29%) also responded that nurses at their workplaces did not receive an introductory education program before handling hazardous drugs. In total, 346 (55%) of the nurses reported that their workplace had a freedom to speak-up guardian or whistle blower policy for members of staff. CONCLUSIONS: Even if most nurses report that there are safety routines in place at their workplaces, the results reveal several serious occupational risks for European nurses handling hazardous cancer drugs. Actions are needed to improve and optimize occupational safety for nursing staff.*

<https://doi.org/10.1016/j.ejon.2024.102595>

- **Articles de périodique**

Lamarque V., Swierczynski G., C. Verdun-Esquer C., Léger C., Canal-Raffin M., Garrigou A., Nascimento A.

**Exposition professionnelle aux médicaments anticancéreux : vers la prise en compte de l'activité pour repenser les actions de prévention.**

Archives des maladies professionnelles et de l'environnement, Volume 85, Numéro 1, janvier 2024, Article 101945

Résumé : *Malgré les efforts réalisés en prévention pour réduire l'exposition professionnelle aux médicaments anticancéreux (MAC), ce problème reste d'actualité. La littérature à ce sujet pointe le besoin de caractériser et d'évaluer les risques et les dangers et de former les professionnels. Grâce à l'ergotoxicologie, mêlant des prélèvements d'essuyages de mains et des entretiens d'autoconfrontation, nous chercherons à savoir comment la poly-exposition et les moyens de protection associés se manifestent dans l'activité des soignants. Les essuyages de mains, réalisés avant/après des actions déterminées comme potentiellement exposantes, montrent la présence de MAC sur l'ensemble des prélèvements (n = 20). La molécule manipulée le jour du prélèvement ne se retrouve que sur 25 % des prélèvements. Deux prélèvements (sur 9) montrent une augmentation du niveau de contamination des mains après une action potentiellement exposante. Les données d'entretiens montrent que malgré le manque de formation, les soignants sont capables d'identifier des sources et des espaces d'exposition potentielle. Nos résultats*

ne montrent qu'une partie de l'énigme de l'exposition aux MAC et ne permettent pas, encore, de la caractériser. Néanmoins, ils montrent des déterminants de la contamination à différents niveaux de l'activité qu'il reste à approfondir. Aussi, nos résultats nous laissent penser que, par nos méthodes, les soignants sont rentrés dans une « zone potentielle de développement », où une partie de leurs connaissances sur les risques biologiques pourraient leur servir de ressources pour mieux gérer le risque chimique et penser une prévention propre aux spécificités des MAC. En effet, au vu, des voies d'exposition et des modes de transmission des contaminations aux risques biologiques, les actions de protection développées pour ce risque pourraient permettre l'élaboration d'une nouvelle forme d'intervention pour les MAC. Cette dernière considérerait les soignants comme agissant face aux poly-expositions et producteurs de leurs actions de protection, qui vont au-delà des équipements de protection prescrits.

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Pirot C., Benoist H., Saint-Lorant G. (Préprint dans Bulletin n° 61)

**Impact of lack of knowledge on risk perception and protective practices of home nurses handling antineoplastic drugs.**

Journal of Oncology Pharmacy Practice, Volume 30, Numéro 2, mars 2024, Page 313-321

Résumé : *INTRODUCTION: Health care workers handling antineoplastic drugs (ADs) are at risk of carcinogenic, mutagenic and reproductive toxic risks (CMR). The aim of this study was to assess the impact of the lack of knowledge (K) on risk perception (P) and on protective practices (PP) related to the handling of home-based chemotherapy (HC) by home nurses. METHODS: This study was conducted in Normandy among home nurses. A questionnaire was developed to explore the K, P and PP related to handling ADs by home nurses working with four different providers from two hospitals. RESULTS: Among the 28 home nurses included, 25.93% had received initial training on the specific treatment of ADs, 48.15% scored below average on risk management K, 52.00% scored below average on personal PP. CONCLUSION: This study reveals the importance of adapted and regular training on the handling of ADs. It will help develop a climate of safety and reinforce adherence to wearing personal protective equipment to protect health care workers from contamination.*

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Caron G., Vasseur M., Courtin J., Masse M., Décaudin B., Stéphanie Genay S., Odou P., Simon N.

**Evaluation of cancer drug infusion devices prior to the implementation of a compounding robot.**

Journal of Oncology Pharmacy Practice, Volume 30, Numéro 2, mars 2024, Page 251-256

Résumé : *INTRODUCTION: Compounding robots are increasingly being implemented in hospital pharmacies. In our hospital, the recent acquisition of a robot (RIVA(TM), ARxIUM) for intravenous cancer drug compounding obliged us to replace the previously used infusion devices. The objective of the present study was to assess and qualify the new intravenous sets prior to their use in our hospital and prior to the implementation of the compounding robot. MATERIALS AND METHODS: The ChemoLock(TM) (ICU Medical) was compared with the devices used previously for compounding (BD PhaSeal(TM), Becton-Dickinson) and infusion (Connect-Z(TM), Codan Medical). The connection/disconnection of infusion devices to/from 50 mL infusion bags was tested with a dynamometer (Multitest-i, Mecmesin). Leakage contamination was visualized by a methylene blue assay and was quantified in simulated pump infusions with 20 mg/mL quinine sulfate (N = 36/group); after the analytical assay had been validated, quinine was detected by UV-spectrophotometry at 280 and 330 nm.*

Groups were compared using chi-squared or Mann-Whitney U tests. **RESULTS:** The connection/disconnection test showed that although all the devices complied with the current standard, there was a statistically significant difference in the mean  $\pm$  standard deviation compression force ( $51.5 \pm 11.6$  for the Connect-Z(TM) vs.  $60.3 \pm 11.7$  for the ChemoLock(TM);  $p = 0.0005$ ). Leaks were detected in 32 (29.1%) of the 110 tests of the ChemoLock(TM). The contamination rates were also significantly different: 13.9% for the BD PhaSeal(TM) versus 75.0% for the ChemoLock(TM);  $p < 0.0001$ ). **DISCUSSION/CONCLUSION:** Our results showed that the new infusion device complied with current standards. However, the presence of contamination emphasizes the need for operators to use the recommended personal protective equipment. Further studies of contamination with cancer drugs are required.

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Dugheri S., Cappelli G., Squillaci D., Rapi I., Fanfani N., Dori F., Cecchi M., Sordi V., Ghiori A., Mucci N.

**Evaluation of the risk of occupational exposure to antineoplastic drugs in healthcare sector: part II - the application of the FMECA method to compare manual vs automated preparation.**

Archives of industrial hygiene and toxicology, Volume 75, Numéro 1, mars 2024, Page 41-50

Résumé : Healthcare workers handling antineoplastic drugs (ADs) in preparation units run the risk of occupational exposure to contaminated surfaces and associated mutagenic, teratogenic, and oncogenic effects of those drugs. To minimise this risk, automated compounding systems, mainly robots, have been replacing manual preparation of intravenous drugs for the last 20 years now, and their number is on the rise. To evaluate contamination risk and the quality of the working environment for healthcare workers preparing ADs, we applied the Failure Mode Effects and Criticality Analysis (FMECA) method to compare the acceptable risk level (ARL), based on the risk priority number (RPN) calculated from five identified failure modes, with the measured risk level (MRL). The model has shown higher risk of exposure with powdered ADs and containers not protected by external plastic shrink film, but we found no clear difference in contamination risk between manual and automated preparation. This approach could be useful to assess and prevent the risk of occupational exposure for healthcare workers coming from residual cytotoxic contamination both for current handling procedures and the newly designed ones. At the same time, contamination monitoring data can be used to keep track of the quality of working conditions by comparing the observed risk profiles with the proposed ARL. Our study has shown that automated preparation may have an upper hand in terms of safety but still leaves room for improvement, at least in our four hospitals.

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