Bulletin de veille n° 71

1er mars 2025 – 30 avril 2025

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 founis sans garantie d'exhaustivité.

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- ***Articles de périodique***

Favier B., Simonin C., Tokatian S., Guitton J., Darnis S., Basset M., Chabaud S. and Gilles L. (Préprint dans Bulletin n° 69)
Cytotoxic surface contamination in hospitals: Current practices, challenges and perspectives.
Journal of Oncology Pharmacy Practice, Volume 31, Numéro 2, mars 2025, page305-314

Résumé: *ObjectiveDespite significant advances in cancer treatment with targeted therapies and immunotherapies, cytotoxic chemotherapies are still extensively used. Potential cytotoxic contamination in preparing and administrating cytotoxics is still a major source of concern. Besides advanced protections including biological safety cabinets, work surface contamination needs to be continuously controlled to ensure that handling procedures and cleaning were appropriate. Contamination monitoring needs to be standardized.Data SourcesThe study searched Pubmed/Medline and Embase with"hazardous drug", "cytotoxic drug", "surface contamination", "environmental contamination", "wipe sample", "pharmacy", "care unit", and selected studies reporting contamination results in work environment for pharmacy technicians and nurses, from 1 January 2017 to 31 December 2022.Data SummaryThe 29 studies totalized 16,196 samples and 189,571 assays. Contamination results showed 39.8% sample positivity, and 8.2% assay positivity. Multicentric studies gathering at least 500 samples or up to 800 samples would limit heterogeneity in sample positivity. In addition, monitoring of an appropriate tracer selection including at least the 7 tracers with the highest contamination frequencies (cyclophosphamide, gemcitabine, fluorouracile, ifosfamide, platinum derivatives, paclitaxel and methotrexate) would facilitate contamination comparisons amongst studies and local results. Most recent studies reported thresholds for cyclophosphamide close to 0.1 ng/cm² at the 90(th) percentile.ConclusionsThe overall risk of exposure for healthcare professionals is a major concern. Sample size in multicentric studies would require at least 500 samples; quantification of all tracers with the highest contamination frequencies need to be quantified. This approach would provide a basis to develop guidelines to appropriately monitor contamination in pharmacies and patient care area managers.*

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Swierczynski G., Canal-Raffin M. and Tuduri L.
Gloves Standards and Occupational Exposure to Antineoplastic Drugs in the European Context.
Health Science Reports, Volume 8, Numéro 3, mars 2025, Article e70592

Résumé: *BACKGROUND AND AIMS: Over 12 million healthcare professionals in Europe are exposed to hazardous medicinal products, including antineoplastic drugs. Dermal route is recognized as the primary route of exposure to antineoplastic drugs, emphasizing the critical importance of skin protection provided by gloves, which necessitates a careful and specific selection process. This study aims to compare the current European standard EN 16523-1:2015 + A1:2018 with the ASTM D6978-05(2023) standard used in the United States. METHODS: Firstly, the three main performance parameters to consider when selecting gloves are described: standardized breakthrough time, standardized permeation rate, and cumulative permeation. Subsequently, the current European and American standards are compared based on the following criteria: part of the glove tested, substances tested, standardized permeation rate, test duration, test temperature, and the information provided on the glove packaging. Additionally, and with a focus on safety, clear examples of how to interpret graphical symbols and indications available on glove packaging are provided to enhance the transferability of the information*

contained in this study to healthcare settings. RESULTS: There is a significant disparity between the requirements of the two standards. Indeed, the only European standard applicable in the context of glove permeation by antineoplastic drugs requires a standardized permeation rate 100 times less stringent than the American standard and does not include any hazardous drugs in its list of substances to be tested. By proposing a list of 24 antineoplastic drugs to be tested, a test temperature of 35 ± 2°C (compared with 23 ± 1°C in the European standard), and by specifically targeting the thinnest part of the glove, the American standard is closer to real-world conditions of use compared to its European counterpart. CONCLUSION: This study underscores the limitations of current European standard, advocating for regulatory updates to better protect healthcare professionals, while emphasizing the complexity of selecting appropriate gloves for antineoplastic and hazardous drug exposure. CLINICAL TRIAL REGISTRATION: Not concerned.

https://doi.org/10.1002/hsr2.70592

Sreekumaran J., Goyal H., Sharma R. and Javeth A.
Educational intervention program regarding safe administration of chemotherapy: A quasiexperimental study among nursing personnel in a tertiary care hospital.
Journal of Education and Health Promotion, Volume 14, Numéro 1, mars 2025, Article 130

Résumé: *Chemotherapy is one of the major choices for treatment of cancer and closely controlling this fatal disease. A registered nurse is primarily responsible for administering chemotherapy with specific drug knowledge and expertise in preparation, administration, and toxicity management. One of the hazards in the healthcare settings is the occupational exposure to chemotherapeutic or cytotoxic drugs. Hence, the study was conducted aiming to evaluate the effectiveness of educational intervention programs in relation to safe administration of chemotherapy among nursing personnel. One group pretest post-test design with quasiexperimental design and the nonprobability purposive sampling technique was employed to select 38 nursing personnel in different chemotherapy units. The data were collected using a structured knowledge questionnaire consisting of 27 knowledge items from different areas like chemotherapy preparation, administration, management of side effects, management of extravasation, safe handling practices, and chemotherapy exposure. Descriptive and inferential statistics were utilized for analysis and interpretation of the obtained data. The overall mean of pretest knowledge score regarding safe administration of chemotherapy among nursing personnel was 16.21 ± 3.82, and the post-test knowledge score was 20.49±2.00. The educational intervention was beneficial in enhancing the knowledge score (P < 0.001). Moreover, after the educational intervention, 68% of the respondents had very good knowledge, 11% had excellent knowledge, and 21% had good knowledge (P < 0.001). The educational intervention program was beneficial in meliorating the knowledge of nursing personnel on safe administration of chemotherapy.*

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Campbell K., Dicksit D. and Polovich M. (Préprint dans Bulletin n° 70)
Predictor Factors Associated With Hazardous Drug Safe Handling Precautions Across a UK Oncology Nurse Sample and Implications for Novel Treatments.
Semininars in Oncology Nursing, Volume 41, Numéro 2, avril 2025, article 151817

Résumé: *OBJECTIVES: The development and use of novel systemic anticancer therapy (SACT) treatments are advancing rapidly. While cytotoxic drugs have traditionally been the cornerstone of treatment, they are increasingly used alongside novel agents. This study aims to assess factors affecting adherence to safe-handling precautions, enhance safety protocols, and minimize potential occupational exposure to hazards in clinical environments, increasing their capacity for novel treatments. METHODS: Cross-sectional, online survey of oncology nurses across the UK who handled SACT. Participants were asked to complete the Factors Predicting Use of Hazardous Drug Safe-Handling Precautions Questionnaire. Descriptive analysis, Spearman rank correlation coefficients, and regression analysis were performed to determine the predictors of precautionary use when handling HDs. FINDINGS: Analysis of (n = 675) participants revealed high knowledge of exposure, high self-efficacy, low perceived barriers, moderate perceived risks, high interpersonal influence, low conflict of interest and moderate safety climate in the workplace. The analysis of the data also indicated weak positive correlations between age and knowledge (rs = 0.093), self-efficacy (rs = 0.103) and safe-handling scores (rs = 0.082); the age of the participants has a weak negative correlation to perceived barriers (rs = -0.141), conflict of interest (rs = -0.116), and workplace safety climate(rs = -0.116). Notably, safe handling scores showed no significant correlation with other theoretical predictors. Comparison between government and private sector nurses (n = 76) demonstrated higher patient volumes F (15.807, 74), P < .001 and significantly lower safe handling scores in the government settings F (4.135, 74) P < .05. CONCLUSIONS: Nurse-patient ratios between government and private sector settings predict global safe-handling precautions. IMPLICATIONS FOR PRACTICE: Novel treatments for nurse-patient ratios are essential, as new therapies and schedules further create additional workload pressures that may reduce safe handling practices.*

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Garnier A., Bonnabry P. and Bouchoud L.
Using simulation to improve pharmacy operators' handling of cytotoxic spills.
Journal of Oncology Pharmacy Practice, Volume 31, Numéro 3, avril 2025, page 355-363

Résumé: *IntroductionInternational Society of Oncology Pharmacy Practitioners guidelines recommend having standard operating procedures (SOPs) and initial and yearly retraining programs on cytotoxic spill handling for pharmacy operators (POs). This study aimed to create a simulation-based training (SBT) program on this subject and evaluate its impact on POs' real-life performance.MethodsRandomly formed pairs of POs underwent a 2.5-hour training program, including two simulation exercises (a broken cytotoxic vial on the floor and a leaking cytotoxic bag) in a simulated pharmacy production unit. Each participant applied the cytotoxic spill handling SOPs. The PO and trainer-pharmacist did a debriefing after each exercise. Satisfaction was recorded on a 0-to-100% scale. A 20-item questionnaire assessed general knowledge about cytotoxic spill handling before and after the training. One month before and one month after the training, the POs underwent a real-life test when the trainer broke a fake cytotoxic vial in the cytotoxic storage area. Their performance in applying the SOPs was assessed on a 20-point checklist, and the time to handle the spill was recorded.ResultsTwelve POs participated. Mean satisfaction score was 98.9%. Mean knowledge score improved from 10.8/20 (SD = 2.0) before training to 14.5/20 (SD = 1.6) after training (p < 0.05). Mean real-life SOP performance improved from 78.6% (SD = 7.4%) to 97.1% (SD = 5.2%) (p < 0.05). Mean time to handle cytotoxic spills decreased from 17.3 minutes (SD = 3.6 minutes) to 11.9 minutes (SD = 1.5 minutes) (p < 0.05).ConclusionPOs improved their knowledge and real-life competencies for handling cytotoxic spills. This training will be included in POs' initial and continuing training programs.*

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Walton A.L., Bush M.A., Sung A.D., Powell M.A., Jin H.J., Silva S.G. and Spasojevic I.
Assessing Etoposide and Cyclophosphamide Contamination and Current Cleaning Practices in Patient Bathrooms.
Clinical Journal of Oncology Nursing, Volume 29, Numéro 2, avril 2025, page e52-e59

Résumé: *BACKGROUND: Antineoplastic drug (AD) exposure presents severe risks to healthcare workers. Previous studies have demonstrated that patient bathrooms are highly contaminated and have led to concern for excreta as a source of environmental contamination with ADs. OBJECTIVES: This study assessed AD contamination and current cleaning practices to remove AD surface contamination in patient bathrooms. METHODS: Three surfaces in the bathrooms of patients who had received etoposide and/or cyclophosphamide were sampled and analyzed for contamination at three time points. Liquid chromatography-tandem mass spectrometry was used for analysis. Interviews and observations of daily and discharge cleaning were conducted to understand cleaning practices. FINDINGS: A significant reduction in etoposide contamination on toilets and floors was observed following discharge cleaning; however, no significant reduction was observed on walls for either AD or on floors for cyclophosphamide.*

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Yang L.H., Liu L.P., Jiang F.Y., Huang F.Z., Xie C.F., Lin X.Q., Wang P. and Feng X.L.
Application of a multifunctional chemotherapy infusion device for reducing antineoplastic drug extravasation.
Frontiers Oncology, Volume 15, 20258, Article 1539389

Résumé: *OBJECTIVE: This study aimed to address the challenges associated with antineoplastic drug extravasation during intravenous administration, through the development of a novel chemotherapy infusion device. A secondary objective was to mitigate associated risks to healthcare personnel, patients, caregivers and the environment. METHODS: A water-soluble fluorescent solution was used as a surrogate for antineoplastic chemotherapy agents to assess the potential for drug extravasation and the associated risks of occupational exposure during intravenous administration. The investigation identified risks related to drug extravasation, which informed the development of the novel infusion device. RESULTS: In experiment 1, conventional methods for replacing infusion bags resulted in drug extravasation during the second bag change across all procedures conducted by 9 operators. Specifically, extravasation was observed in 81 out of 90 procedures. In experiment 2, the newly designed multifunctional chemotherapy infusion device, which requires each infusion bag to be punctured only once, was used. Under these conditions, the same 9 operators performed 90 procedures, with extravasation occurring in only 2 instances. CONCLUSION: The multifunctional chemotherapy infusion device facilitates the efficient administration of intravenous chemotherapy while addressing the issue of drug extravasation associated with traditional infusion devices during the delivery of antineoplastic drugs. This device effectively reduces the risk of occupational injuries among healthcare workers, reduces harm to patients and their caregivers, and mitigates environmental contamination.*

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