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CLINICAL SUMMARY

THE ROLE OF PACKAGING SIZE ON CONTAMINATION RATES DURING SIMULATED PRESENTATION TO A STERILE FIELD

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BACKGROUND

Hospital-acquired infections (HAIs) have been the cause of substantial pain and suffering to patients, as well as increased morbidity and mortality.[1] Based on 2007 data, Scott suggested that the overall annual direct costs to US hospitals alone resulting from HAIs was approximately between 28–45 billion US dollars.[1,2] There are few published studies on indirect contact transmission occurring via a contaminated, intermediate object or person. A potential source of indirect contamination is the result of package handling during opening and presentation of devices to the sterile field. The specific goal of this research by Trier et al.[3] was to assess the impact of a single packaging design factor, specifically pouch size in flexible peel packs, on rates of contact between package contents and the outside of the pouch or gloves of the circulator during aseptic presentation to a simulated sterile field.

OBJECTIVES AND METHODS

This study recruited ninety-seven (97) healthcare providers at three locations. Each participant opened and aseptically presented the contents of three sizes of pouch twice, for a total of six trials per participant. Each subject participated in a total of six trials (two trials with every pouch size), for a total of 582 trials. As a first step, the study coordinator coated the pouches and gloves with a simulated contaminant, prior to each opening trial. Then, the study coordinator examined the presence of the contaminant content of each pouch to the simulated field and data recorded for contact contamination. Data analyzed and estimated the probability of content contact and assessed the effect of pouch size.

RESULTS

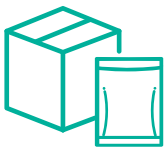
Data from 81 females and 16 males were available for analysis. Professional occupation frequencies were: 55 nurses, 40 surgical technologists, one doctor and one "other" healthcare provider. Results indicate evidence for an effect of pouch size on the probability of contact between the package contents and a non-sterile surface (P= 0.0108). More specifically, **larger pouches induced greater rates of contact of package contents than smaller pouches** (LSME*+/-SEM: 14.76+/-2.9% vs. 6.06+/-1.7%, respectively; P=0.0130).

CONCLUSION

This study provides evidence that pouch size has the potential to impact rates of contamination of package contents during aseptic presentation to the sterile field. Increased contamination rates are associated with larger pouches when compared to smaller pouches. The investigative team hypothesized that larger pouches manipulation occurs more frequently (i.e., required more repositioning of the hands) during the opening process as compared to the small pouch. Understanding the relationship of package size to contamination risk and the potential impact on HAIs is a rich area for future investigations which should include other packaging design factors and their role in contamination.

APPLICATION FOR PRACTICE

1



As a step towards the prevention of HAIs, consider smaller packet size when selecting sterile products that are presented on to the sterile field

2

Follow policies and guidelines for opening and presenting sterile supplies and equipment to a sterile field

3

Choose a recognized manufacturer that can provide a large variety of quality smaller packaged alternatives such as surgical gloves

*Least square mean estimates (LSME) and corresponding estimated standard errors (SEM).

Note: This clinical summary is written by clinicians at Ansell Healthcare Products LLC. Please refer to the actual study for full text information.

Trier T, Bello N, Bush TR, Bix L. The role of packaging size on contamination rates during simulated presentation to a sterile field. PLoS One. 2014;9(7):e100414. Published 2014 Jul 8. Link to access full text article: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4086713/

References:

1. *Monina Klevens R, Edwards JR, Richards CL, et al., Estimating Health Care-Associated Infections and Deaths in U.S. Hospitals, 2002. Public Health report; 2007; 12, 160-166.*
2. *Douglas Scott R., The direct medical costs of healthcare-associated infections in US hospitals and the benefits of prevention. (2009) https://www.cdc.gov/hai/pdfs/hai/scott costpaper.pdf. Accessed October 12, 2023.*

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