

Factors involved in the safety of reused paper/plastic sterilization pouches in a clinical setting

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Description

Paper/plastic sterilization pouches are commonly used packaging material for steam sterilization. Reuse of these pouches is a general practice in Thailand despite a single-use recommendation. This study aimed to determine microbial contamination after reusing paper/plastic sterilization pouches in a dental clinic and storage in a closed environment for 6 months. Three hundred and twenty pouches underwent 3 times of clinical use in terms of packaging, autoclave sterilization, handling, and unpacking. A mouth mirror was packed in each pouch to be used in a clinic. After each use, a pouch would be carefully inspected for reusability and undergone packaging, sterilization, handling again. In all steps, sterilization monitoring was rigorously applied. After 3 times of use, a piece of filter paper was placed inside each pouch (instead of a mouth mirror), the pouch was autoclaved and stored in a closed environment for 6 months. Then the filter paper was retrieved for microbial cultivation. A negative control group comprised new pouches containing filter paper without storage and a positive control group comprised pouches with impaired integrity. All samples in both the reuse and the negative control groups had no microbial contamination. All samples in the positive control group showed contamination. These results suggested that reusing paper/plastic sterilization pouches could be a safe practice provided careful monitoring and inspection were employed.

Survey on the Reuse or Resterilization of the Packaging

In a general dental practice, adequate supply of sterile dental instruments is a vital part of every dental procedure with packaging and sterilization as important processes to prevent infection. Steam sterilization using an autoclave is the most commonly used method of sterilization due to its simplicity, effectiveness, and practicality. Packaging helps preserve the sterility of sterilized instruments in storage before use by preventing microbial contamination from the external environment after the sterilization process. A number of studies on infection control cover various aspects including personal hygiene and personal protective equipment such as wearing

gloves, disinfection and sterilization methods, sterilization monitoring, as well as knowledge of infection control. Few studies focus on packaging, though. Previous studies found closed environments such as closed cabinets or drawers to be preferable to open environments such as open shelves or corridors and that safe storage time of sterile packages was at least up to 30 months. The most commonly used packaging material for steam sterilization is paper/plastic sterilization pouch due to its convenience of use, content visibility, and efficacy. These paper/plastic sterilization pouches are disposable and recommended to be used only a single time. However, a survey on autoclave dental packaging in Thailand found that such pouches were routinely reused in more than 80% of the private clinics and in about 30% of the hospital clinics surveyed. Moreover, the pouches were used most frequently 3 times but could be up to 5 times. This is the only survey on the reuse or reesterilization of the packaging. Moreover, there is no study on the impact of reuse/resterilization of packaging in actual practice.

Incidence of Contamination in Reused Pouches in Actual Clinical Settings

These studies agreed that contamination was inadvertent and was not time-related; however, all these observations were from single-use pouches. There is no study on the incidence of contamination in reused pouches in actual clinical settings. The objective of this study aimed to assess sterility maintenance of reused pouches in practice. This study could provide information regarding the factors involved in the safety of reused paper/plastic sterilization pouches in a clinical setting. Currently, there is no study on the reuse practice on how this process is actually done in various clinical settings or what the incidence of contamination is. Our study demonstrated that reusing paper/plastic sterilization pouches can be safe provided certain factors are carefully applied and monitored. The limitations that need to be considered are the tearing of the pouch and careful inspection before re-packaging. These issues require the operator to clearly understand the procedure and realize the importance of each step in advance. For convenience and safety,

single-use of a paper/plastic sterilization pouch is still a recommended practice.