Determining the Influence of Washing on the Aerosol Performance of an Anti-Static Valved Holding Chamber

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Introduction

Figure 1. The OptiChamber Diamond VHC can be used to optimize delivery from pMDIs.

The valved holding chamber (VHC) has been designed to help improve and optimize delivery for those using pressurized metered dose inhalers (pMDIs).[1] The OptiChamber Diamond VHC (Figure 1; Diamond; Philips Respironics, Respironics New Jersey, Inc., Parsippany, NJ) is a compact, anti-static VHC designed to facilitate effective aerosol delivery to respiratory patients. This study compared the aerosol characteristics of an unwashed ('out-of-the-box') and prewashed preproduction Diamond VHC using three pMDI drug formulations.

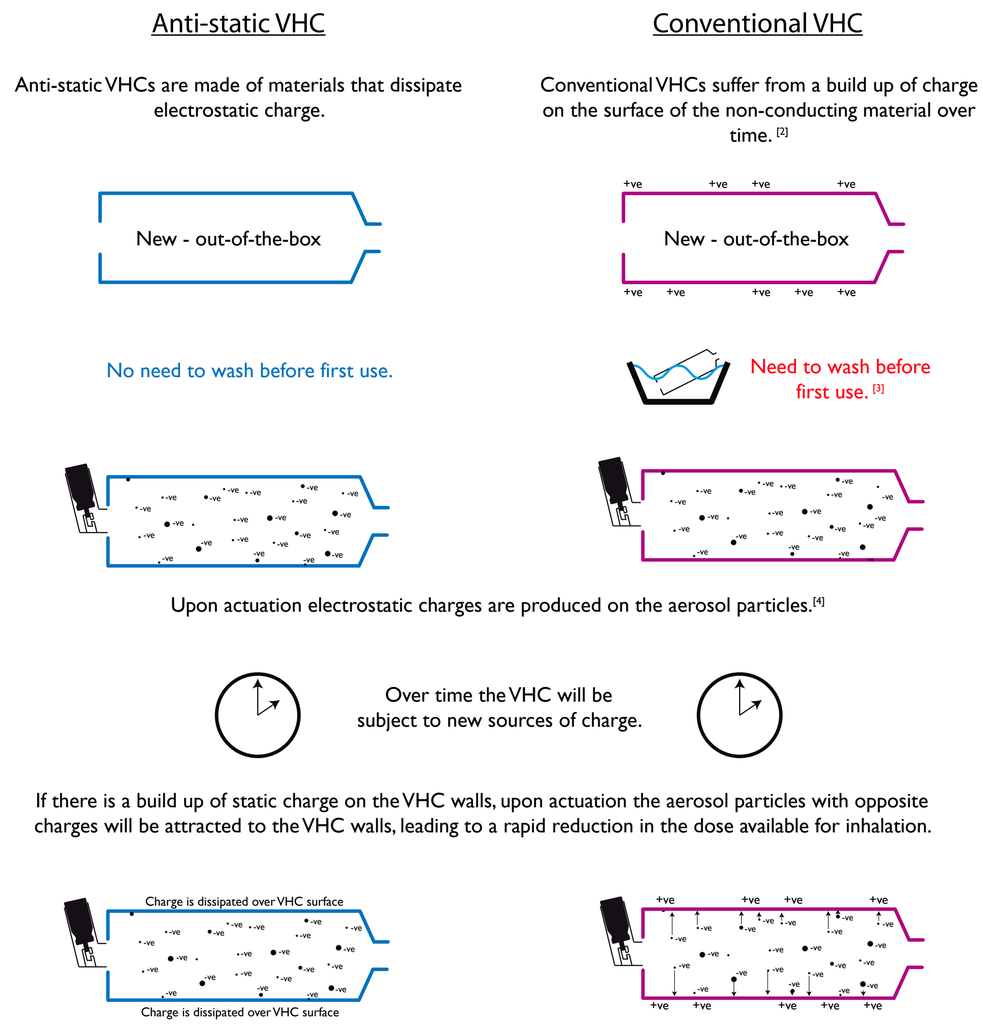

Figure 2. Rationale behind the use of an anti-static VHC

Method

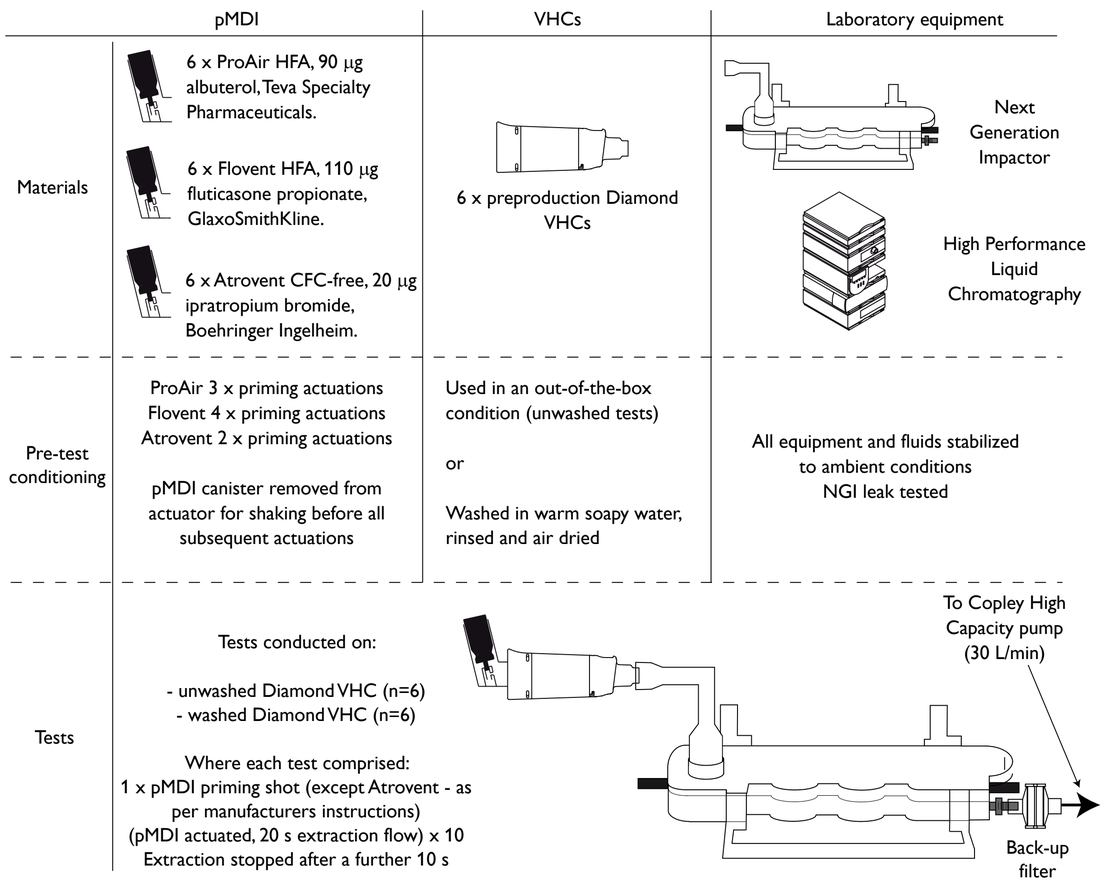

Figure 3. Experimental test method.

After each test, the induction port, back-up filter, NGI cups and VHCs were processed using the relevant HPLC assay diluent. CITDAS V3.10 software was used to generate the aerosol characteristics data. The fine particle dose (amount of drug in NGI ≤ 4.7 µm), and Mass Median Aerodynamic Diameter (MMAD) were calculated.

Results

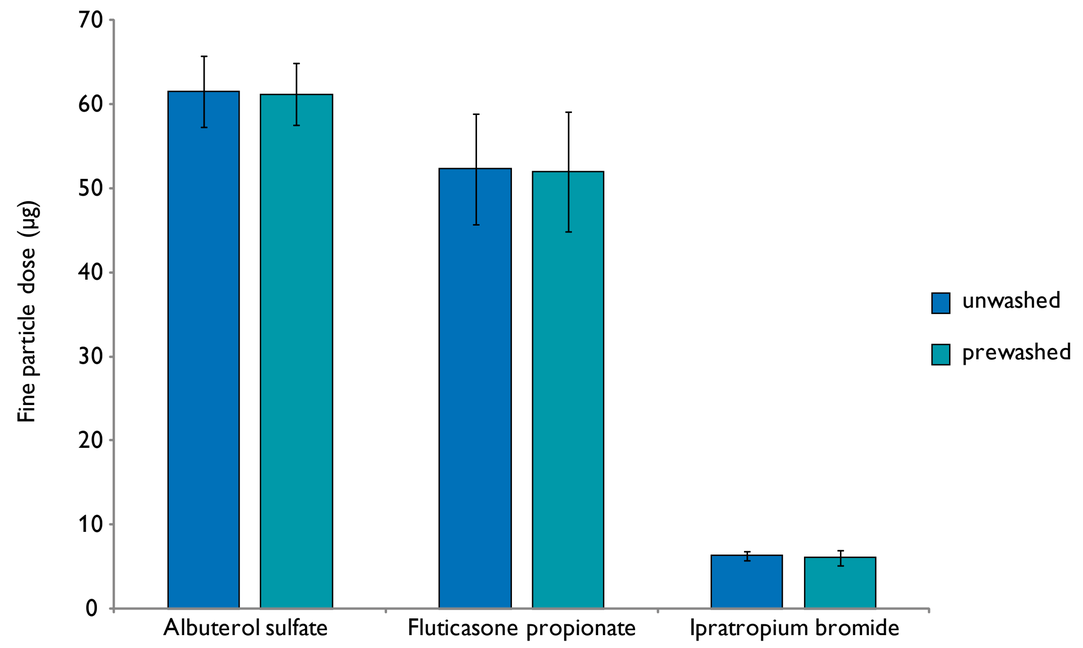

Figure 4. Mean fine particle dose (amount of drug in NGI ≤ 4.7 µm) from the unwashed Diamond VHCs and prewashed Diamond VHCs. Error bars denote standard deviation about the mean.

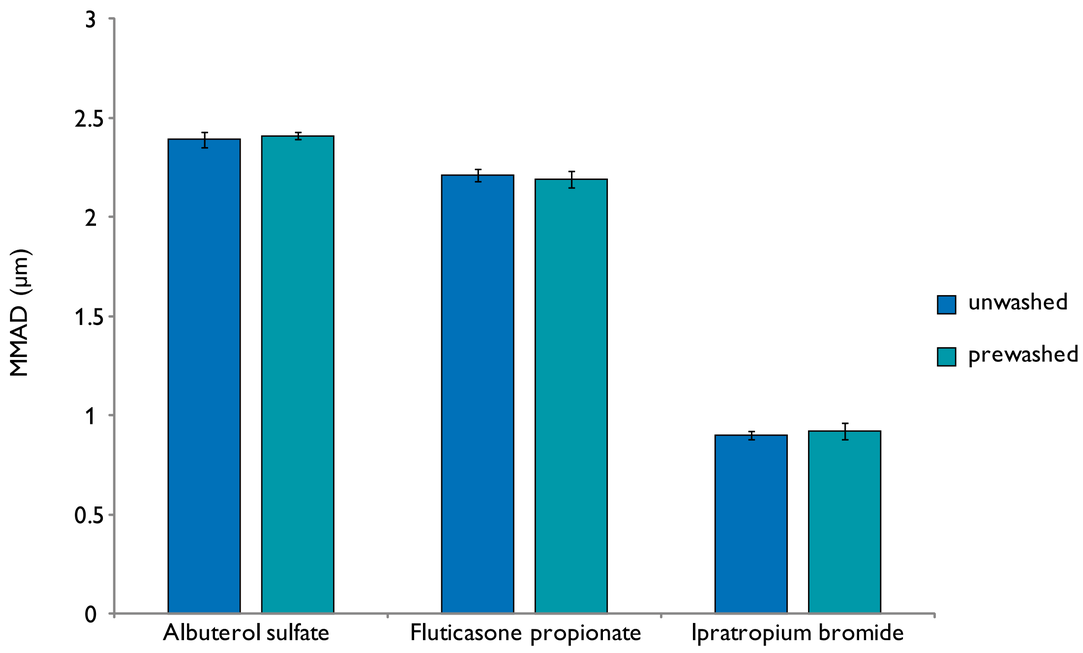

Figure 5. Mean MMAD (mass median aerodynamic diameter) from the unwashed Diamond VHCs and prewashed Diamond VHCs. Error bars denote standard deviation about the mean.

Discussion

Both the fine particle doses and MMADs for the three pMDI drug formulations were similar from unwashed and prewashed Diamond VHCs. The practical benefit of these results is that they show that users and care givers can use a new Diamond VHC for treatment as soon as it is removed from the packing without having to wash the device first, as is the case with conventional VHCs.

Conclusions

- There were minimal differences in the aerosol characteristics between the unwashed and prewashed pMDI VHC combinations with all of the drugs tested.
- The results indicate that the aerosol performance of the Diamond VHC is the same when used in either unwashed or prewashed states.

References

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