

# Percussion Palm Cup: Safety and Usability of Newly Designed Products in Infants and Children with Cystic Fibrosis

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## Abstract

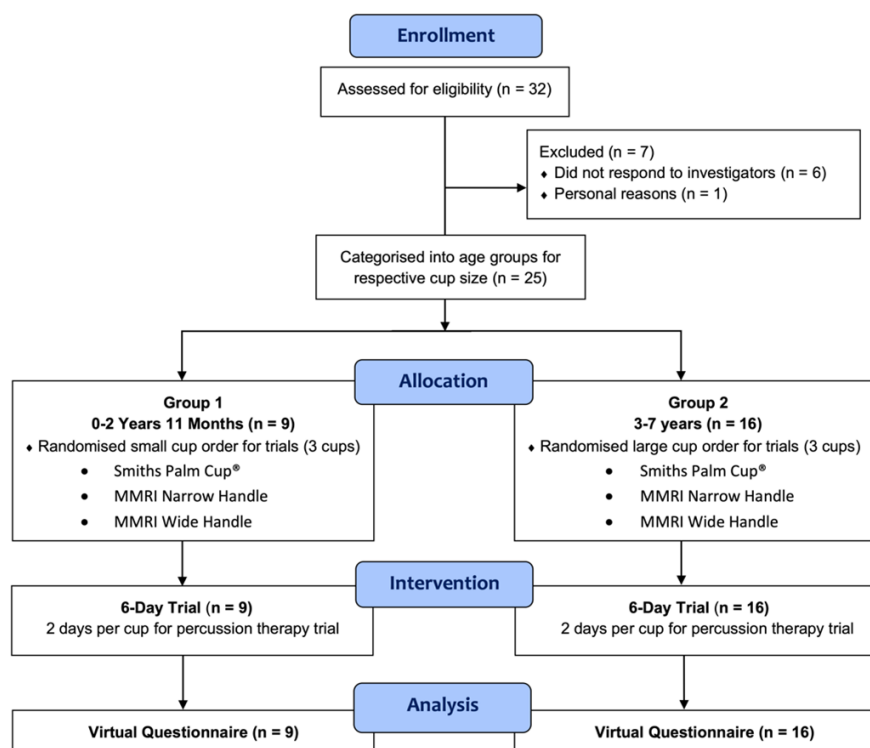
Background: Manual percussion is used during airway clearance sessions for children with cystic fibrosis. Use of percussor cups can assist manual chest physiotherapy percussion when the treatment is too taxing, or the adult hand is too large. The Canadian distribution for the usual commercial percussor was recently discontinued. The McMaster Manufacturing Research Institute (MMRI) was approached to produce two percussor cup prototypes as potential alternatives. The objective of this study was to evaluate the useability, satisfaction, preference, and safety of the MMRI percussor cups compared to the Smiths Palm Cup® Percussor. Methods: Participants were allocated to two groups based on age. Order of percussor cup use was randomized; caregivers used each percussor cup for 2 consecutive days. Data collection included: demographics, the Quebec User Evaluation of Satisfaction with assistive Technology 2.0, the Pictorial Single-Item Usability Scale, adverse effect report, overall satisfaction ratings and top percussor cup ranking. Results: Twenty-five caregivers and their children enrolled in and completed the study. The MMRI narrow handle percussor prototype, regardless of cup size, was comparable in usability, safety and effectiveness. This can be a locally sourced, innovative solution in Canada for a pediatric percussor cup. Conclusions: All percussor types were favourably reported across metrics examining usability, safety, and effectiveness, apart from the MMRI small cup, wide handle prototype. Overall, the MMRI wide handle prototype was the least preferred, regardless of cup size, while the MMRI narrow handle prototype was comparable to the Smiths Palm Cup® Percussor across all metrics, regardless of cup size.

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**Small**

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