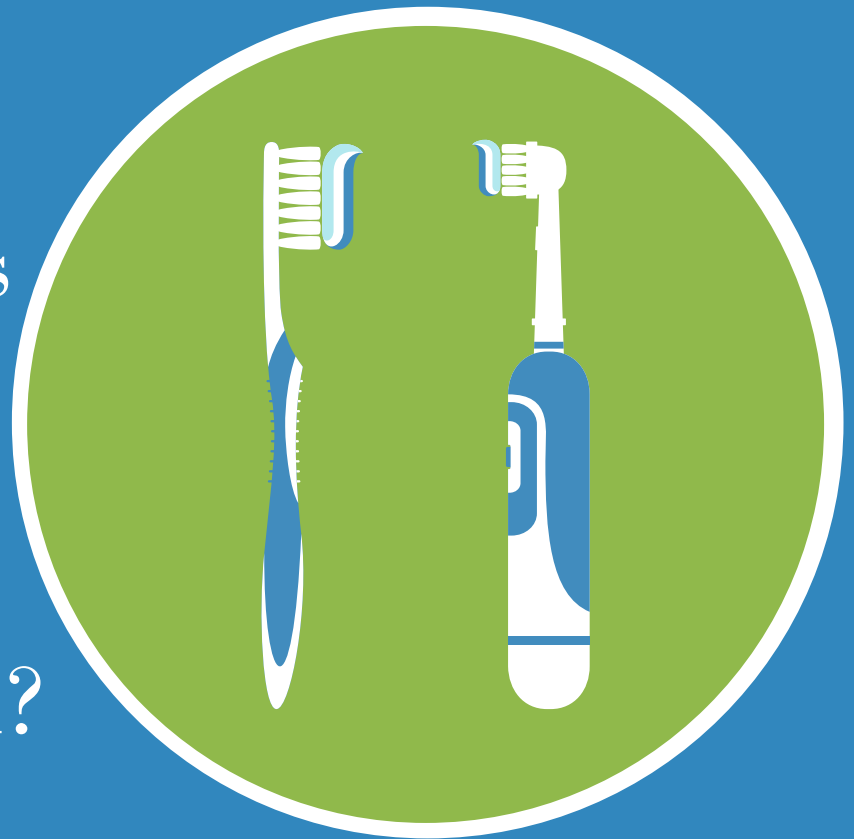


Should five to eleven-year-olds use manual or electric toothbrushes to clean their teeth?



For the first time, *BDJ Team* is sharing content from sister publication *Evidence-Based Dentistry (EBD)*. *EBD* delivers the best available evidence on the latest developments in oral health. In this paediatric dentistry summary review, **Amanda Gallie**¹ provides a commentary on the paper *Evaluation of the ability of five- to 11-year-olds to brush their teeth effectively with manual and electric toothbrushing (Pediatr Dent 2019; 41: 20-24)* written by Kerr R, Claman D, Amini H, Alexy E, Kumar A and Casamassimo P S in the USA.

Practice points

To assess a child's potential toothbrushing ability the dental team should ask questions such as:

1. Is the child's handwriting good?
2. Can the child cut up food/cut out complex shapes?
3. Can the patient play a musical instrument well?

If these specific activities are being carried out well, then a child can potentially brush independently.

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Abstract

Design A cohort study design was used. One hundred and twenty healthy children were randomly assigned to a manual group and an electric tooth brushing group. Plaque scores plus a post-brushing questionnaire examining executive function/motor skills using indices from the occupational and developmental sciences (eg shoelace tying), was completed by the parents.

Sample selection One hundred and twenty subjects were recruited from a single site, the Nationwide Children's Hospital in Columbus, Ohio. The entire research project was carried out in the dental department there. All children were fit and healthy and presented with:

- No caries
- No disability that would affect the task completion

- No injury to the dominant hand
- Adequate parental literacy to complete a questionnaire
- Teeth present to score.

All ages were evenly represented in the final sample.

Data analysis Two hygienists and one dentist were calibrated and trained in the use of the OHI-S plaque scoring system. Reliability was determined using the Cohen's kappa. Teeth were disclosed and pre-brushing plaque scores were obtained. A set of brief brushing instructions were delivered orally to the patient. The children were given a brush and were asked to brush at a sink with no toothpaste or mirror. The minimum brushing time was 30 seconds but the children were unaware that they were being timed. Post-



brushing plaque scores were measured.

Results The response rate to the questionnaire was 100%. A chisquare test was carried out on the data. The results showed that if a child can exhibit the following skills/ characteristics they were more likely to perform well in the brushing task:

- Never has poor handwriting
- Always writes their address
- Always ties their own shoes
- Always cuts food into bite-sized pieces
- Can cut out complex shapes.

There was a positive correlation between pre-brushing scores and post-brushing scores.

Conclusions Good handwriting and other motor/cognitive skills were linked to good tooth brushing and manual and electric toothbrushing were equally effective at removing plaque. If a child was able to play a musical instrument well, they were likely to have less plaque. The study also demonstrated that parents are good judges of their children's abilities and motor skills.

Commentary

The objective of this study was to help develop a set of characteristics that could help parents, care givers and health professionals determine when a child is ready to brush

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their own teeth in an effective way. Ideally, a child should brush for two minutes to ensure adequate plaque removal. A second objective was to determine the effectiveness of manual and electric toothbrushing and to compare them. Which toothbrush technique the child had been taught was not taken into account in this study and the fact that the child was only observed brushing on one occasion diminishes the impact of the findings of this study. The children in the study were from low socioeconomic backgrounds and if socioeconomic status is associated with motor skillsets and function the results may not be generalisable to the population at large. There has been very little work carried out globally on exact proficiency sets linked to the skill

of tooth brushing and the question of ‘when can my child brush alone?’ can be a difficult question to answer. As the age sets of children here were broad with children aged from 5–11 years, further work needs to be carried out to ascertain age specific motor skillsets. The strengths of this study were, however, the use of motor skill markers from other fields of child development and the relatively large sample size.

This summary review was originally published in *EBD* on 27 September 2019: <https://www.nature.com/articles/s41432-019-0038-1>.

<https://doi.org/10.1038/s41407-019-0205-4>