RAPID TECHNOLOGY REVIEW

Oral Health Division
Ministry of Health Malaysia

Title	**Extra-Oral Vacuum Aspirator / Suction**
Requestor	**Principal Director of Oral Health** **Ministry of Health Malaysia**
Reason For Request	**To provide scientific evidence on the effectiveness and safety of Extra-Oral Vacuum Aspirator / Suction for the use in the dental clinics**

1. INTRODUCTION

Extra-Oral Vacuum Aspirator / Suction is a device designed to absorb the aerosol generated during the dental treatment process to prevent cross-infection in the dental clinics. The dental aerosols are produced from dental instruments like ultrasonic scalers, dental handpieces, three-way syringes and other high-speed instruments. Aerosols produced are contaminated with saliva, blood, plaque, calculus, bacteria, fungi, viruses of the oral cavity and micro-particles from grinding of the teeth.[1] These aerosols are air suspended in the clinical environment and can pose risks to the clinician, staff and other patients as well.[2]

Coronavirus disease 2019 (COVID-19) is a highly infectious disease transmitted through droplet spray, direct contact, aerosol and fomite (indirect contact).[2] Dental team members are considered to be at increased risk of COVID-19 as they work in close proximity to patients and conduct aerosol generating procedures.[3] As such, many countries have suspended routine dental treatment for the time being and limit their scope to emergency dental treatments only.

Resuming general dental services after limitation of treatment due to COVID-19 should be done cautiously. The dental team's and patient's safety are the highest priority to be taken into consideration when forming the related guidelines or protocol. A device to eliminate or reduce the aerosol generated during dental procedures will help to minimize cross infection in the dental clinics.

2. EVIDENCE ON EFFECTIVENESS AND SAFETY

The systematic search for new evidence from the scientific databases such as MEDLINE, EBM Reviews, EMBASE via OVID, PubMed and from general search engines were performed. Additional articles were identified from reviewing the reference of retrieved articles. The search strategy used these terms either singly or in various combinations: extra-oral, vacuum suction and vacuum aspirator. Only one study evaluating the effectiveness of extra-oral vacuum aspirator was retrieved.

Teanpaisan et al (2001)[4] conducted a case-control study using a modified Extra-Oral Vacuum Aspirator (EOVA) to eliminate bacteria. The production and removal of aerosols of oral bacteria during dental treatment procedures on human subjects were investigated. Twenty-four separate procedures were performed on different days. Fourteen procedures involved restorative work on teeth in different areas of the mouth. In the other ten procedures, scaling was performed with an ultrasonic scaler. The control was the same number of procedures but without running the EOVA device.

Blood agar culture plates were placed on the chest of subjects and left in position for two minutes during each procedure. The plates were then incubated under anaerobic conditions in an anaerobic chamber for 48h at 37°C, and resultant colonies were counted. Results from this study showed that the mean recoverable counts of oral bacteria were significantly lower when using EOVA.

3. CONCLUSION

There was no retrievable evidence from scientific databases regarding safety and cost-effectiveness of the EOVA. Only one study shows the effectiveness of EOVA in reducing the mean recoverable counts of oral bacteria. More evidence-based studies are needed to further investigate this matter.

Reference:

1. Harrel, Stephen K.; Molinari, John (2004-04-01). "Aerosols and splatter in dentistry: A brief review of the literature and infection control implications". *The Journal of the American Dental Association. 135 (4): 429–437.*
2. Miyu Moriyama, Walter J. Hugentobler and Akiko Iwasaki. Annual Review of Virology Seasonality of Respiratory Viral Infections. March 16, 2020
3. Scottish Dental Clinical Effectiveness Programme. Resuming General Dental Services Following COVID-19 Shutdown. A guide and implementation tools for general dental practice. For Phase 2 of dental services remobilisation 25 May 2020.
4. R. Teanpaisan, M. Taeporamaysamai, P. Rattanachone, N. Poldoung and S. Srisintorn (2001). The usefulness of the modified extra-oral vacuum aspirator (EOVA) from household vacuum cleaner in reducing bacteria in dental aerosols*. International Dental Journal (2001) 51, 413-416.*

Based on evidence up to 1st Jun 2020

Disclosure: The authors of this report has no competing interest in this subject.

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