

## Cleaning Efficacy of Evacuation Line Solutions

### Purpose:

To investigate the cleaning capabilities of two evacuation system cleaners in a clinical practice.

### Materials and Methods:

#### Phase 1.

Used evacuation lines were replaced with new lines in four dental operatories of a busy practice. Each of the four new installed lines were assigned a test evacuation cleaner. Lines 1 and 2 – *Monarch Cleanstream Evacuation System Cleaner* with the *Monarch Cleanstream Dispenser System* (Air Techniques), and Lines 3 and 4 – *PureVac Evacuation System Cleaner* with the *PureVac Auto Walkabout Dispenser* (Sultan Healthcare) were cleaned every work day as per manufacturer's instructions for a six-month period. Visual analyses were done at two and six months of the study.

#### Phase 2.

A mixture of sheep blood, human saliva, artificial test soil, and tooth, zirconia, and lithium disilicate powders was created and flushed through new clear tubing multiple times a day for two weeks. After the accumulation of organic debris within the lumens of the evacuation lines was established, experimental evacuation line cleaners were used, as per manufacturer's instructions, to treat lines 10 times over a period of four days. Following the conclusion of treatments, evacuation lines were visually analyzed and microscopically photographed.

### Results:

#### Phase 1.

Following two months of treatment with test cleaners, very little accumulation was demonstrable and no notable difference between cleaning solutions was observed (Figure 1). At six months, an increase in the accumulation of organic debris was observed in all of the four test lines that resulted in a thin layer on the surface of the lumens. For each experimental evacuation treatment tested, one line of the two lines tested produced slightly less build-up of contaminants (Figure 2). This could be due to the quantity or types of dental procedures performed. Overall, each of the evacuation cleaners tested demonstrated similar final results.

#### Phase 2.

Heavily contaminated, clear evacuation lines (Figure 3) underwent 10 cleaning treatments within a four-day period. After three treatments, about 80% of the lumen surfaces were cleaned with use of both test solutions. Following the tenth and final treatment, both cleaners were able to remove >90% of the accumulated debris.

**Figure 1a,b.** New evacuation lines after two months of treatment.

a) Line 1, Line 2; b) Line 3, Line 4

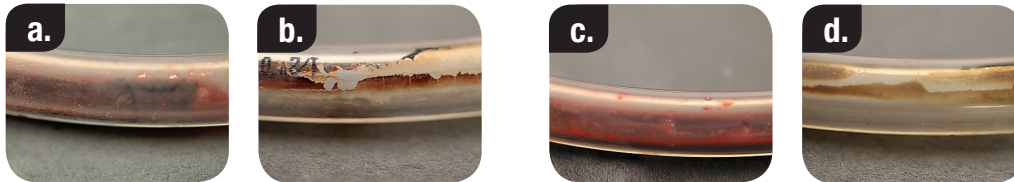


**Figure 2a, b.** Treated evacuation lines after six months of treatment.

a) Line 1, Line 2; b) Line 3, Line 4

**Figure 3.** Simulated contamination of evacuation lines before and after treatment.

a) Monarch before b) Monarch after c) Purevac before d) Purevac after



## Conclusion:

In this study evacuation lines used in an active clinic and those contaminated in a laboratory were treated with two test cleaning solutions. Both test cleaners had the ability to maintain unobstructed lines throughout the entire six-month period of clinical use, while also having the ability to remove a substantial amount of accumulated contamination created in a laboratory. **Monarch Cleanstream Evacuation System Cleaner** (Air Techniques) performed comparably to **PureVac Evacuation System Cleaner** (Sultan Healthcare).

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