

# Does Your Evacuation Suck?

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*Alexander Bischoff*

The author has informally surveyed 180 dental assistants about evacuation cleaning, gaining a profound sense of how challenging a job it is to manage vacuum traps and suction systems.

Every practitioner and member of the dental team knows that a healthy suction is essential for all patient procedures. Regular evacuation cleaning is part of most practices' daily cleaning regimes, and its necessity is obvious when the traps are opened for cleaning. Unfortunately, most trap cleaning is done by hand, and often by the newest (and least experienced) hire in the office. The process of cleansing the evacuation system traps at various collection points is unpleasant, smelly, and tedious. It can be dangerous to the individual tasked with this job unless appropriate barriers (gloves and masks) are properly used. The

evacuation lines cannot be cleaned directly because their lumens are very inaccessible.

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It is far less known and obvious that this presents significant hygiene and patient health issues, as well. In chair side situations where slow or weak suction permit "back flow" (the reversal of

fluid flow from the suction tubing into the mouth), there is a real danger of cross infection. This is particularly problematic because on occasions when the suction is not clearing the oral liquids quickly enough, patients tend to close their mouths, inadvertently creating negative pressure and "back flow." This can have the undesired effect of drawing foreign saliva into their mouths!

## **WEAK SUCTION ISSUES**

A healthy evacuation system is one that efficiently sucks the patient's saliva and other oral liquids OUT of the mouth, without ANY risk of suction tube retained liquids or solids (and the bacteria lurking and breeding in them) accidentally "reversing" their direction INTO the patient's mouth.

Suction is measured in bars. The ideal suction level throughout the system is between 11-12 bars.<sup>1</sup>



**FIGURE 1** - Debris inside suction line builds over time.



**FIGURE 2** - Debris inside suction pipe after Bio-Pure Microbial Cleaning.

It is a good and important clinical exercise for every practice to accurately measure their suction power level as part of their annual evacuation pump service.

If suction power is too high (more than 14 bars), it is readily noticed by the dental team. The disposable high speed suction tip (and possibly the low speed one as well) will seize the tongue or cheek (or rubber dam), complicating clinical treatment. Excess pressure may actually leave a small hematoma where the tissue was pulled into the tip.

If suction power is too low (less than five bars), it may escape patient and dental team detection altogether. It will be somewhat inefficient for the dentist and the assistant, but unlikely to disrupt treatment. The patient experience may be acceptable, particularly if the saliva/water buildup in the mouth is slight and/or they can overcome the liquid pool by closing the

lips to increase the perceived pressure. It is, unfortunately, all too easy for the patient to “out suck” five bars, initiating “flow back” into their mouth. At best, this is highly unpleasant for the patient; at worst, the

“flow back” fluid may contain disease-causing bacteria from earlier patients. Highly unlikely, but possible, is the patient’s ingestion of highly infectious bacteria (such as Legionnaire’s disease) that tend to develop in uncleaned, neglected fluid evacuation systems.

#### WHAT CAUSES SLOW SUCTION

Slow suction indicates that an evacuation system is failing in its primary purpose of “safe oral evacuation”, and it is the typical the results of one or more of the

following issues:

1. The evacuation pump is undersized or not working to optimal capacity. The proper size of the pump is determined by the number of operatories and the number of

**If suction power is too low (less than 5 bars) the patient can “out suck” the evacuation system, initiating “flow back” from the suction tubing into their mouth**

high and low speed evacuation system in each operatory.

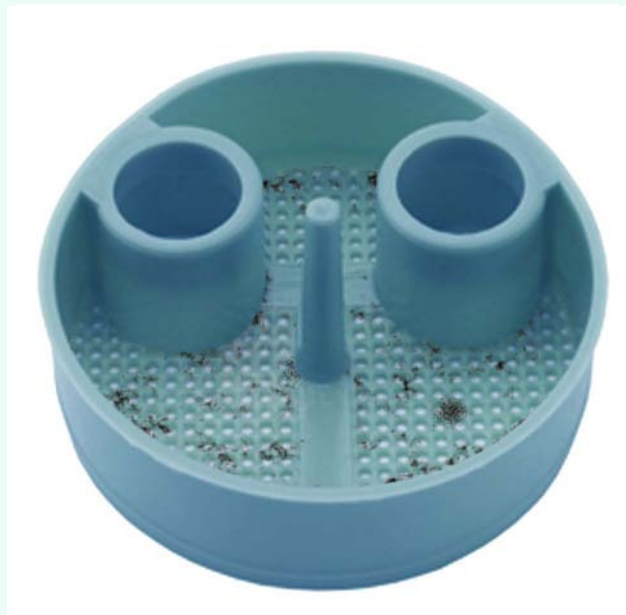
2. Pumps, much as any machine, age and decrease in efficiency over time (Fig. 1).

3. Regular prescribed evacuation system maintenance is an essential part of the practice routine. Any neglect of the systematic protocols risks the failure of the system.

4. There is a blockage of the line/pipe/filters in the evacuation



**FIGURE 3** - Sludge, bacteria and debris in operatory trap.



**FIGURE 4** - Operatory trap after Bio-Pure Microbial Cleaning.

system. The obstruction is most commonly an accumulation of material that has built up over time.

5. Each time the evacuation system is flushed with a chemical, traces of chemicals and other materials (biofilm plaque) are left clinging to the inside surfaces of the lines and pipes (Fig. 2).

**MICROBIOLOGICAL EVACUATION SYSTEM CLEANERS**

Microbiology-based cleansing products are typically safer than their chemical counterparts; they are organic and do not contain any materials that are harmful to people or the environment. They clean very differently from traditional compounds that dissolve accumulated waste, leaving it to settle elsewhere in the system such as traps, filters, pipe walls or amalgam separators; microbiology-based cleaners rely on living bacteria to eat/digest organic waste. The bacteria consume prophylaxis paste, organic tissues, and other waste materials. The more waste



**FIGURE 5** - Suction filter (before).



**FIGURE 6** - Suction filter (after).

there is, the more the bacteria digest (Figs. 3&4).

Sable Industries of Kitchener has introduced the Bio-Pure Evacuation System Cleaner, an innovative product that restores and maintains evacuation system flow and function by actively

breaking down and digesting organic waste. Designed to break down the vacuum line buildup enzymatically, the Bio-Pure Evacuation System Cleaner's specialized bacteria essentially digests any remaining organic waste. It has a proprietary, designer microbial formula that

returns vacuum line suction to the full pump capacity. Not only is the current trapping of sludge from blood, tissues, and most dental materials eliminated, but pre-existing debris is bacterially digested and eradicated as well (Figs. 5 & 6).

The Sable Bio-Pure Evacuation System Cleaner is comprised of 100 percent all-natural ingredients. Its neutral pH is safe for handling, and it is noncorrosive, safe for amalgam collectors and pump components. In the process of removing trap sludge and line biofilm, it also eliminates odor.

Sable's Bio-Pure does not require any additional equipment, or even a significant change to

### MICROBIOLOGY-BASED CLEANSING HISTORY

The concept of developing an evacuation cleaner based on "friendly" microbes that consume waste (not to be confused with chemical microbial cleaners for water lines that kill harmful bacteria) is not new. First developed in 2002 as a collaboration between Mark Cushman (Bio-Pure Products, Inc.) and Dr. Bernard, PhD, the intention was to develop new applications for powder-based microbe cleanser formulations that had originated in the farming industry. After four years of research, the dental formulation was ready. The product was validated in clinical practices, and has been adopted by increasing number of practitioners.

## Microbiology-based cleansing products require only two applications per week in contrast to the daily use of chemical cleaners

regular evacuation cleansing operations. Microbiology-based cleansing products require only two applications per week in contrast to the daily use of chemical cleaners (the bacteria continue to consume sludge after they have entered the evacuation system). Supplied in a convenient powder format, it is simply dissolved in water. Once the product is mixed, it is aspirated into the evacuation system using the high volume and saliva ejector lines, as for any other cleaner—only less often! There is no foaming.

### CHALLENGES IN THE DENTAL FIELD

There are three significant hurdles that microbiology-based cleansing products must overcome in the dental industry:

Microbiology is a new science to the dental industry. Busy practitioners and staff are slow to investigate product innovation in unfamiliar areas. Dental teams also tend to be conservative, sticking with known techniques and products unless significantly motivated otherwise.

Dental catalogues include more than 38,000 products. New product introductions that address potential long-term and invisible problems get limited attention.

Chemical cleansing compounds represent a profitable recurring consumable revenue. Both name and house brands abound. Manufacturers make significant marketing and incentive expenditures to maintain the status quo.

Trap and line cleansers are a minor sundry products, and receive little print or podium attention. The other side of the issue is that there are serious patient, personnel, and practice implications when and if evacuation cleanliness is neglected.

### CONCLUSION

The typical cost of a branded chemical evacuation cleaner (per operator, per year) is \$240.00. The typical cost of a microbiology-based evacuation cleaner (per operator, per year) is about 50 percent of that amount. While these positive financial differences do not make a major impact on the practice, the benefits of a healthy evacuation system to patients, staff, and practitioners, do. **OH**

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*Disclaimer: Alexander (Alex) Bischoff is Executive VP of Sales and Marketing at Bio-Pure. Bischoff's responsibilities as EVP of Sales and Marketing include product sales, training the dealer network, and educating the dental industry about the potential of microbial cleaning.*

*Oral Health welcomes this original article.*