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Disinfection of Dental Impressions

Closing the Loop on Infection Control

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Dental Laboratory Technicians, Denturists and Dental auxiliary staff tasked with model preparation, pouring impressions and preparing cases are highly vulnerable to cross contamination from pathogens commonly found in the dental environment. A comprehensive program of infection control for the Dental Laboratory must become an integral part of the Dental Professional's IC regimen. Infection control programs are only as effective as their weakest link.

While much attention has been directed toward proper surface disinfection, sterilization and instrument care in the dental office, one of the weakest links in the entire program continues to be how effective we are at addressing potential pathogens that are commonly transferred to dental impressions. When improperly addressed, these pathogens will go on to contaminate the dental cast (model), work areas throughout the dental laboratory and even finished cases which have been processed in the dental lab.

To quantify the issue at hand, a recent study by the International Journal of Prosthodontics found that only 30% to 40% of dental offices were aware of the possible persistence of MRSA or P aeruginosa on dental impressions and casts. These organisms will also contaminate dental pumice when allowed to flow freely into the dental laboratory. Cultures taken from dental casts grew a large number of visible bacterial colonies on all samples tested. Testing isolated the following pathogens that are known to be responsible for nosocomial and/or life threatening infections in immunocompromised hosts:

Streptococci.....100%
Candida.....46.2%
P aeruginosa 7.7%
Staphylococci.....65.4%
MRSA.....15.4%

It is safe to say that part of the reason for the lack of comprehensive infection control programs for dental impressions and pumice seems to be due to a lack of understanding among personnel in relation to what sort of disinfection is required, how disinfection products and techniques will affect the integrity of the impression itself and, how long impressions need to be treated to provide effective protection against the sort of pathogens named above.

Studies commissioned by the Journal of the American Dental Association reported that treatment of dental impressions ranged from a 30 minute soak in gluteraldehyde to 18 hours in gluteraldehyde to "home grown" treatments involving the use of solutions not approved by either the ADA or the product manufacturers. The JADA study supports the idea that the reason for this wide variety of approaches toward infection control lies directly in staff education. They report that almost half of Dental Laboratory directors feel their personnel receive inadequate infection control instruction. Manufacturers have an important roll to play in this matter.

In the past, it was believed that only soaking impressions in cold sterilants or bleach would provide the level of infection control required. The consequence of this however has been a distinct loss of critical detail in both hydrophilic and hydrophobic impression materials. Clearly, soaking a material known to absorb liquid in a liquid disinfectant for extended period of time seems counter intuitive but with no suitable alternatives in place, these procedures were either grudgingly followed – or in some cases ignored.

Throughout the past decade, manufactures of disinfectant products for the healthcare and dental industry have come to the plate with constantly evolving products that progressively raise the bar on the capacity of disinfectant agents to address common pathogens that populate the surface of impressions. The ADA has in the past recommended using properly registered disinfectant soaks for no more than 30 minutes, however, new broad spectrum disinfectants can easily destroy common dental pathogens in as little as 3 minutes using a liquid spray rather than a soak. A quick check with your dental supplier will prove to be fruitful in this effort. Use of low alcohol, high kill disinfectants that are labeled **Bactericidal, Fungicidal, Virucidal** and **Tuberculocidal** will allow personnel to effectively clean and disinfect impressions before they are dispatched to the dental laboratory. To ensure that all cases are properly disinfected, it is also strongly indicated that the laboratory should spray all impressions with the same level of broad spectrum disinfectant and leave for a minimum of 3 minutes before working on the case. By disinfecting the impression (the source of contamination) there should be no need to further disinfect the cast.

Infection control experts agree that it may be helpful for dental offices and laboratories to initiate a standardized tagging system for impressions to be sent to the laboratory. Dental staff members should place a sticker (see below) on all outgoing cases. The tag will indicate the manufacturer's recommended contact time, product used and the proven spectrum of germicidal activity for the product in use. It is possible to use products that do not feature the four key groups of pathogens as shown on the label but failure to do so will simply perpetuate the confusion that already currently exists.

This impression has been disinfected
for 3 minutes by:
GermiCide3
Bactericidal Fungicidal
Virucidal Tuberculocidal

By upgrading impression infection control to the latest, most advanced products available, the dental practitioner can ensure that they are doing all that can be done to protect themselves, their staff and their families from exposure to robust, hard to treat pathogens. By communicating this between the dental office and the dental laboratory, dental professionals can ensure that the same communications principles are used to communicate complex specifications such as shade, bite, mould etc and will apply for the mutual benefit of both parties with regards to infection prevention and control.