Infection Prevention and Dental Impressions

General Information
Impressions from within the oral cavity are taken in order to create moulds upon which prosthesis can be manufactured. These dental impressions and their prosthesis are regarded as single use and then custom made devices. The oral cavity is a rich microbial environment and contamination of the impression by oral pathogens and commensal microflora is assumed. The risk of contamination with blood is not common but more frequently present than the attribution of “rare” as a description. The risk of blood borne viruses is therefore appropriate for consideration in this context. The Australian Government regulator for this area of Medical Devices is the Therapeutic Goods Administration (TGA).

Impression Material Issues
Impression materials and their mould are recognised as Medical Devices and are normally included for entry onto the Australian Register of Medical Devices (ARTG). A critical issue for these materials, particularly once an impression is made, any change of shape will cause the mould to be misshapen and destroy patient/client value. It is critical that any infection prevention intervention not compromise the integrity of the shape of the impression or the mould. The primary infection risk is to staff. A secondary risk is present for patients should aseptic technique be poor within the prosthetics laboratory. Guidance provided here is intended as a general advice only and specific advice on infection prevention may be required in individual circumstances. The reader should also refer to the NHMRC infection control guidelines (NHMRC 2010).

Hygiene
The materials carried within the oral cavity include saliva, enzymes and various other proteins. Bacteria and other microorganisms are also carried within these moist substances. Most of these materials are quite sticky and will dry to a residue which can protect and even nourish the bacteria which will aid in their survival. Studies have indicated that dental instruments pose a particularly difficult problem for cleaning due to the nature of the soils (Smith 2002). When an impression is taken from within the oral cavity, these various substances are transferred onto the impression as "soils". If these soils be allowed to dry out, they are quite difficult to remove, and thus bacteria may also persist on the impression material. The longer the time in which these soils are allowed to dry out, the greater the likelihood of bacterial or other microbial persistence within the soil on the surface of the impression. These soils also present an asepsis risk as the soil/bacteria/virus may be transferred (particularly whilst still moist) onto another surface such as the mould or via hands (with or without gloves) onto the surfaces around the work area. Thus the mould may also act as a fomite for potential infection. Once these microbial containing soils have left the index patient, they present an infection risk to anyone handling the impression or the mould. This is an occupational health and safety issue for staff working in prosthesis laboratories and dental laboratories.

Infection Risks
The oral cavity contains an array of microorganisms (Pye 2009). Most are not pathogenic. If the microbes are already carried within the oral cavity by a patient, then that patient is not at further risk of infection with their own germs via an impression taken from their own mouth. However, some microbes do pose an infection risk. Should blood be present in the saliva and oral cavity, then there is a heightened risk of transmission of blood borne viruses, such as Hepatitis Viruses and even HIV (the AIDS virus). In very rare cases, the impression may be contaminated by respiratory pathogens, which are coughed up into the mouth from the lungs. For example, impressions taken on a patient previously diagnosed with tuberculosis were found to harbour the causative agent Mycobacterium tuberculosis (Ray 1963). If there is a patient risk of mycobacteria, then a suitable High Level Disinfectant (AIDL Plus or OPAL) should be substituted for the Instrumax and the soaking time should be adjusted to the appropriate time and temperature conditions as recommended on the label.
Although the risk of transmission is low, many microbial pathogens have the capacity for long periods of survival on fomites (surfaces that act as hosts for germs). The survival period does vary substantially between different organisms, from seconds to weeks of time. Studies have shown that important multi-drug-resistant-organisms, such as MRSA can be transmitted in the context of the dental clinic between patients and staff (Roberts 2011).

**Infection Prevention Intervention**

The hazard posed by oral materials on impression materials, and subsequent moulds is dramatically reduced by thorough cleaning of the impression material or the mould. Cleaning is recommended using a Medical Grade Neutral Detergent (Sonidet or Mediclean) or Medical Grade Enzymatic Detergent (Medizyme or Zen). These products will not normally affect the shape or dimensions of impression materials. Cleaning should be completed as soon as possible after the impression material has “set” (i.e. assumed its hardened shape). If alginate based impression materials are used, the impressions should not be exposed to a liquid environment (cleaning, disinfection plus rinses) for longer than 1 hour.

Cleaning should be completed by following the instructions below as Part A:

**Part A: Cleaning**

1. Wear appropriate PPE (gloves etc);
2. Dilute the Whiteley Medical Product – as per the label instructions – into warm water (temperature below 35°C);
3. Immerse the impression or mould gently into the warm detergent solution. Allow to soak for no more than 30 – 60 seconds;
4. Gently brush the surfaces of the impression material with a soft cloth or brush to remove any adherent material;
5. Remove the impression or mould and rinse under a gentle stream of warm water;
6. Allow to dry.

Disinfection using an appropriate Instrument Disinfectant

Normally, thorough cleaning of dental impressions should be sufficient to remove soils and micro-organisms. However, where “Additional Precautions” are required then an appropriately TGA registered Instrument Disinfectant should be used (NHMRC 2010).

Under the requirements of Therapeutic Goods Order, Number 54, 1996 (TGO 54), only a registered Instrument Disinfectant can be used to disinfect another medical device. In fact, Hospital Grade Disinfectants are specifically excluded from use as Instrument Disinfectants under TGO 54. Instrument Disinfectants are fully registered Medical Devices under the Medical Devices Regulations (Clth) 2002. There are four classes of Instrument Disinfectants, being a Sterilant, or a High Level Instrument Grade Disinfectants, or a Medium Level Instrument Grade Disinfectants, or finally a Low Level Instrument Grade Disinfectants.

For applications such as Dental Impressions, only a Low Level Instrument Grade Disinfectant is required. We recommend our product Instrumax Pink [AUSTR 135544] as suitable for this task. Because these products are not for re-use per se (i.e. only the mouth of the index patient is implicated, and no other patient mouth will be entered), Instrumax is suitable for disinfection of dental impressions. Instrumax will not affect or distort dental impressions when used as directed. The use of Instrumax is recommended as follows:

**Part B: Disinfection (Additional Precautions)**

1. First clean the dental impression following part A above;
2. Pour the Instrumax into a clean container with a lid;
3. Place the dried or freshly cleaned dental impression or mould into the Instrumax in the container and close the lid;
4. Leave soaking for 10 minutes only (remove after no more than 15 minutes);
5. Rinse off Instrumax using a gentle stream of warm running water; Allow to dry.
Surfaces
Whiteley Medical recommends that all clinical surfaces be thoroughly cleaned using both a detergent or disinfectant wipe, followed by a compatible disinfectant. Studies have shown that V-Wipes and then Viraclean will aid in the control of MDRO via surfaces when used as directed (Freidman 2013) and will generally provide a more effective intervention than a three step process involving use of chlorine as a disinfectant.

Conclusion
Following these recommendations will provide a dental impression or mould that is clean and free from potentially infectious material.

Whiteley Technical Team
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References
Freidman et al., “The effectiveness of a single stage versus traditional three staged protocol of hospital disinfection at eradicating vancomycin resistant enterococci from frequently touched surfaces” : Am J Infect Control: 2013, (43, )227-231

Markovic et al., “Residual debris deposits on endodontic instruments after hygienic processing”: J Hosp Infection: 2009, 71, 190-192


