

Technical note: Simple and Effective Way to Alleviate Cross-Infection During Taking Intraoral Radiography

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A number of infected diseases such as AIDS, hepatitis B & C as well as tuberculosis are hazardous to dental practitioners [1]. For this reason, the chance of cross-infection when taking intraoral X-ray radiography should be critically alerted in dental clinics. Chain of infection consists of (i) virulence; (ii) susceptible host; (iii) portal of entry; (iv) amount; and at least one part must be removed in order to break the chain of infection [2]. Hence, the fundamental principle behind cross-infection control is to prevent contaminated or polluted materials from transmitting disease cross-infected between patients and oral health workers (dentists/technicians) [3, 4].

Standard infection-control protocols have been adopted for intraoral radiography and are summarized as: 1. Prepackage X-ray film and sterilize film-holding instruments; 2. Disinfect environmental working surfaces; 3. Disinfect the apron; 4. Disinfect and cover X-ray head and support; 5. Cover disinfected environmental working surfaces; 6. Process contaminated X-ray films; 7. Remove all barriers & respray or wipe all working surfaces and apron [5, 6]. However, such procedures are found to be expensive and tedious and not easily to be performed. Here, we present an alternative method to lessen the risk of cross-infection during intraoral X-ray taking of dental patients.

MATERIALS AND METHODS

Our recommended procedures to reduce cross infection for routine intraoral radiography are described detailly as below:

Before taking intraoral radiography

The operator first prepares two

medium-sized plastic bags and double-face scotch tapes (Fig. 1A). Then, he/she has to presterilize these two plastic bags using ultra-violet light (Fig. 1B). Subsequently, the operator attaches the two medium sized

ultra-violet light-treated plastic bags on the wall where double-face tape was pretaped (Fig. 1C).

Taking intraoral radiography

The operator puts on the latex gloves and starts to take X-ray film for patient intraorally (Fig. 1D).

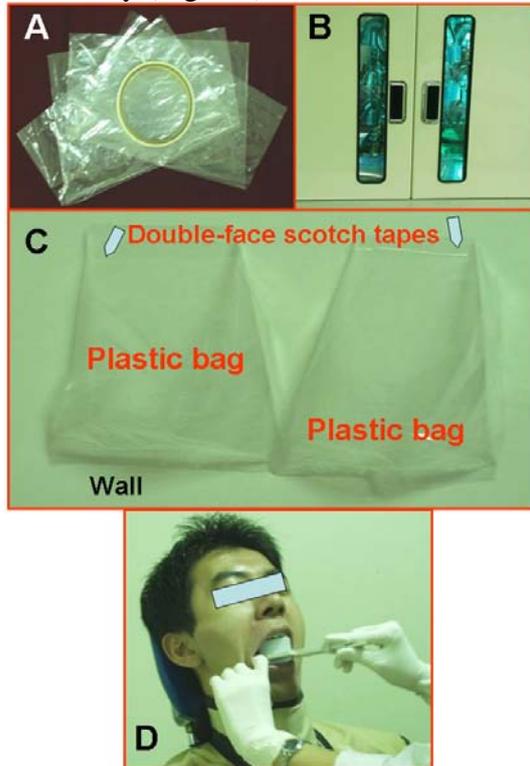


Figure 1 Two medium-sized plastic bags and double-face scotch tapes (A) are sterilized using ultra-violet light (B). The two ultra-violet light treated plastic bags are then put on the wall with double-face tape was pretaped (C). The operator wears the latex gloves and commences to take intraoral radiography (D).

Then, importantly, the operator inserts both hands (with latex glove) into the plastic bags when he/she needs to adjust the tubehead (Fig. 2A). Always with the gloved hands covered by plastic bags, the operator moves the tubehead to the accurate position and adjusts the kVp (Fig. 2B-C). The operator leaves the X-ray room, closes the door and presses the X-ray button (always with the gloved hands covered by plastic bags!) (Fig. 2D).

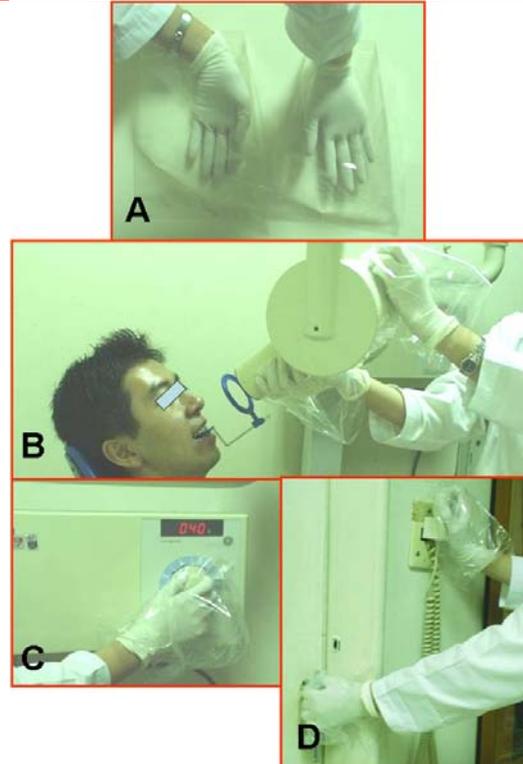


Figure 2 The operator with latex glove inserts both hands into the plastic bags (A) to locate the tubehead (B) and to adjust the kVp (C). The operator, with the gloved hands covered by plastic bags, closes the X-ray room door and pushes the X-ray button (D).

After finishing intraoral radiography

Again, always with the gloved hand covered by plastic bag, the operator takes off the apron (Fig. 3).



Figure 3 The operator, with the gloved hands covered by plastic bags, takes off the apron.

Then, the operator sticks the plastic bags back to the wall and, if necessary, continues to take the next film using the same way (Fig. 4); or, discard the used plastic bags after finishing the intraoral X-ray film taking.

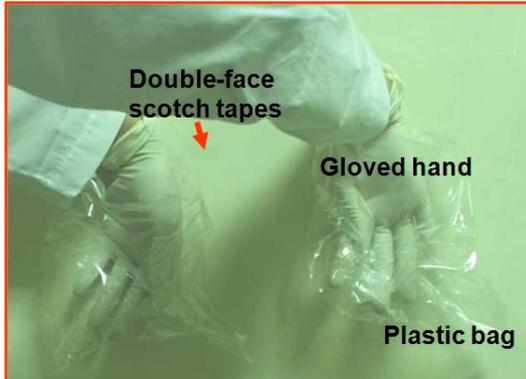


Figure 4 The operator sticks the plastic bags back to the wall.

Before processing the exposed film

First, washing off any saliva or blood stains, etc under running water (Fig. 5A) and then disinfect the exposed film thoroughly with surface disinfectant and blotting it with towel paper (Fig. 5B-C).

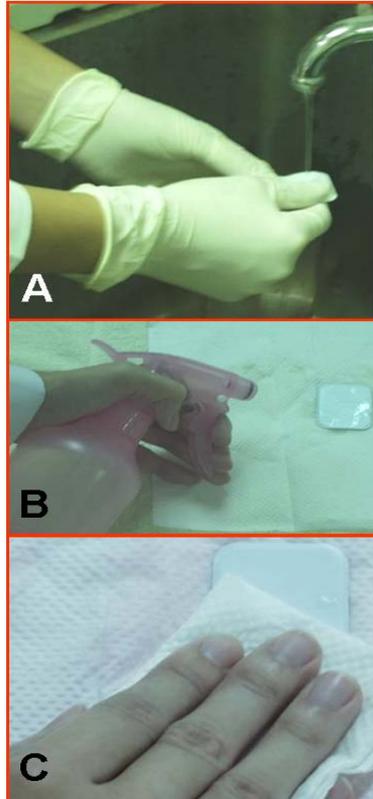


Figure 5 Wash (A), disinfect (B) the exposed film and then blotting it with towel paper (C).

Processing the exposed film

Without wearing the latex gloves, the operator processes the exposed film, for instance using an automatic machine (Fig. 6A).

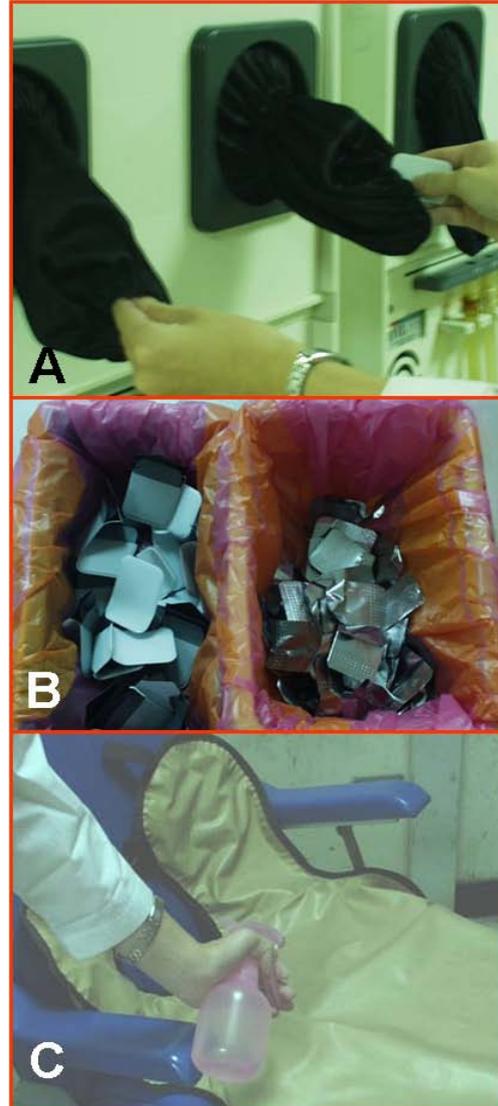


Figure 6 Processing the film with automatic machine (A). Discard the plastic bag and the lead foil separately (B). Disinfect the apron with surface disinfectant for the next patient (C).

After processing the exposed film

The operator must separate the plastic bag and the lead foil, and discard them separately in different baskets (Fig. 6B). Finally, disinfect the apron with surface disinfectant and prepared for the next patient (Fig. 6C).

COMMENTS

The use of proper infection control procedures in the dental office is essential to avoid the spread of infectious agents. The potential for cross contamination between dental personnel and the patient is considerable when taking and exposing intraoral radiographs. The basic idea for the present suggested procedures to decrease the chance of cross-infection during taking intraoral radiography is easy to understand and the underlying concept conforms to the fundamental principle for cross-infection control inhibiting contaminated materials to be cross-infected between patients and oral health workers.

Importantly, the latex glove, contacting the patients, is contaminated and should be blocked from touching other clean areas. The outside surface of the plastic bag inserted with gloved-hand, is clean and is allowed to contact other clean areas. However, it should be aware that the inside surface of the plastic bag contacting with the latex glove is always contaminated.

As aforementioned, the adopted standard procedures from literature [5, 6], though effective, do appear to be time consuming and high expenditure with squandering a lot of disposable materials. On the other hand, the regimen introduced in the present report are quite simple and of low cost. The only materials required are the double-sided tapes and plastic bags. Furthermore, our suggested procedures, most importantly, are effective to alleviate the opportunities of cross-infection during taking intraoral X-ray film for dental patients.

CONCLUSION

The potential for cross-contamination in dental radiology is extremely high, especially when intraoral radiographs are exposed and processed [1-4]. The current report recommends a modified infection control practices that can decrease the potential for cross-contamination in intraoral radiology and reduce the likelihood of disease transmission. It is emphasized that dental practitioners are encouraged to employ our suggested infection control regimens procedures for taking and processing intraoral X-ray films. □

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