

## ■ Proceedings

# The 10th East Asian Conference on Infection Control and Prevention EACIC 2011

Busan, 13-14 Oct 2011

## The contamination of Loan Instruments detected by Adenosine Tri-Phosphate quantitatively

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### Abstract

**Background :** A practical guideline of the perioperative care was published in 2008 by Japanese Association for Operative Medicine. Eleven recommendation on loan instruments(LI) are shown in it, which includes decontamination and sterilization in clinical setting before and after use ,and decontamination by supplier after receiving LI from hospital. One year after publication of the guideline, surveillance by questionnaire was carried out, and 57 institutions replied. In the result, 37% of them decontaminated and then sterilized before surgical use and others reconfirmed the soil on LI only by visual check. On 63% of the supplied institutions soils were recognized by hospital personnel .

**Methods :** Adenosine Tri-Phosphate (ATP) detector (LuminometerUNG3® 3M) was employed for the detection of soil on LI. Before clinical detection, the relationship between protein soil and ATP value was experimentally studied. And then flexible reamers after returned to suppliers were tested by ATP detector.

**Results :** Protein and ATP value were well correlated experimentally. 347 flexible reamers were detected. ATP levels were lower among almost all instruments among which the lowest was 10RLU and the highest was 436,254RLU. From twenty-two higher than four Log10 value of ATP were detected. However on the fifteen of twenty-two instruments the soils could not be recognized visually, though soils of them were demonstrated by ATP detector.

**Conclusion :** Visual check of the soil on LI is not fully reliable, and chemical detection of them should be necessary.

**Keywords :** loan instruments, contamination, ATP

## The quantitative evaluation of alcohol hand rubbing reflecting busy healthcare setting

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### Abstract

**Objective :** Compliance of hand hygiene is international problem to improve. Even fifteen seconds is not easy to take at the timing to be required to have hand hygiene during busy daily work in clinical setting. Lesser time with adequate volume of alcoholic hand rub have to be studied for the compliance improvement.

**Methods :** On nine healthy adults their hand rubbings according to WHO method were studied with alcoholic hand rubbing agent including 1% fluorescent (HRA). Their hand rubbing results were evaluated to take pictures with black light at 3, 7, 15 and 30 seconds after the rubbing. The pictures were copied on the thick paper and the colored parts were cut to measure the weight to evaluate proportion covered by HRA.

**Results :** The proportion of covered area on palms was higher compare to the backs through the study. The proportions of HRA covering on hands tend to be in proportion in length of rubbing time. The proportion with a 3 seconds rubbing was significantly lower than one with a 15 seconds rubbing, but the proportion with a 7 seconds rubbing was same as one with a 15 seconds rubbing. When the proportions of HRA of both hands were added up in same condition, backs always showed lower proportion than palms did. The lowest proportion was confirmed on backs with 3 seconds rubbing (Both of right and left: an average of 0.34) followed by interdigital area under distal interphalangeal joints on a back with 3 seconds rubbing (an average of Right 0.24, Left 0.49).

**Conclusion :** No differences were confirmed between the proportions of HRA covering on hands with hand rubbing which reflected the situation at busy healthcare settings (for 7 seconds with HRA in small volume ) and the one with hand rubbing which was recommended as a regular method (for over 15 seconds with HRA in regular volume). Dividing evaluation area randomly made it possible to know the condition of each coating area after hand rubbing with short time and small volume of HRA which reflected busy healthcare settings. Moreover, it enabled us to detect areas which were difficult to disinfect. This method, visualizing the proportion of HRA coating on hands with HRA with 1% fluorescent object and a black light installed in fluorometer, made it possible to evaluate the level of HRA in hand hygiene quantitatively.

**Keywords :** fluorescence, short time rubbing, cover ratio, quantitative evaluation

## Microbial Flora Recovered from Surgical Instruments used in Abdominal Surgery

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**Background/Objective :** Despite of many attempts to prevent surgical site infection (SSI), the route of microbial transmission is still unclear. Surgical instruments can be suspected as vehicles of microbes since they have direct contact with organ and tissue of surgical patient. We studied microbial flora recovered from surgical instruments used in abdominal surgery.

**Methods :** One-hundred-forty forceps were obtained from 24 operations aseptically. The cases were selected randomly from five types of abdominal surgical procedure performed during the period between November and December, 2008. Three types of forceps were chosen as test instruments, and collected at the end of surgery.

For microbiological investigation, each forceps was immersed in phosphate buffered saline with 0.05% polysorbate 80 solution in sterilized plastic bag made by polyethylene. They were agitated on a shaker at 150 rpm for 30 minutes. Then the fluid was filtered through membrane filter (Milliflex®, Millipore,  $\phi 0.45\mu\text{m}$ ). The filter was cultured on trypticase soy agar at 32.5°C for 3 days. Colonies were counted and identified using microbial identification kit.

**Results :** Microbes were recovered from 33% of 140 forceps. They were classified into 66 strains. The frequency of strains detected was 80.3%, 9.1%, and 6.1%, in gram-positive cocci (*Staphylococcus* spp, *Kocuria* spp, *Micrococcus* spp, *Enterococcus* spp, *Streptococcus* spp), gram-positive rods, and gram-negative rods (*Stenotrophomonas* spp), respectively. The strains derived from skin flora were dominant.

**Discussion :** It is important to identify the route of microbial contamination. In this study, resident microbial flora of the skin and that of digestive tract were recovered from surgical instruments. So, it is suggested that surgical instruments were microbially contaminated during abdominal surgery.

**Conclusion :** Forceps were contaminated by microbes during they were used in abdominal surgery. They might act as vehicles of microbes, which may become pathogen of SSI.

## A respiratory protector to use when a disaster occurred

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**Objective :** When the earthquake in New Zealand occurred in 2011 just before that in north-east of Japan, Japanese fire rescue task forces had worked hard for lifesaving in the disaster area. After coming back to Japan, they visited Tokyo Metropolitan Health and Medical Treatment Corporation Ebara Hospital for medical examination. They experienced heavy dusty exposure that enforced them to use respiratory protection. The information regarding respiratory protector is useful for the lifesaving activity in those environment.

**Method :** The information on the respiratory protector used and medical symptoms are analyzed by twenty-five task force members are included.

**Results :** The information common to all the members are as follows:

- 1) Continuous long labor through day and night.
- 2) The short rest in temporary tent.
- 3) The sleep disturbance by significant rise and fall of environmental temperature in the night.
- 4) Operation of the heavy industrial machine needed close attention.
- 5) In convenience from temporary installed rest room.

One of two members who operated heavy industrial machine using only surgical mask developed respiratory disorder and received the medical care near the spot. Three of twenty-two members used N95 respirators had light respiratory symptoms such as sore throat. N95 respirators they used are not suitable for long hard labor they performed because of the poor air penetration. Because they were too much concentrated on the mission, they tended to ignore their own safety.

**Conclusion :** When one engaged in lifesaving labor in the disaster area, the choice of respirator with high quality and easy to breathe is one of the important factors for self-saving.

**Keywords :** respirator education