Proceedings

# **Conference on Infection Prevention and Control in Greifswald 2010**

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## PROGRAMME

Oral Session Chairpersons : Kramer A, Kobayashi H

## 1. The interaction between alcoholic antiseptics and chlorhexidine

Yoshiro Sogawa<sup>1)</sup>, Hiroyoshi Kobayashi<sup>1)</sup>, Takumi Kajiura<sup>1)</sup>, Hirohisa Endo<sup>1)</sup>, Nobutaka Tsurushima<sup>1)</sup>, Etsuko Okazaki<sup>1)</sup>, Tomoko Takemoto<sup>1)</sup>, Noriko Kuruno<sup>1)</sup>, Yuhei Saito<sup>2)</sup>, Masashige Sasaki<sup>1)</sup>, Erisa Sugawara<sup>1)</sup>, Chie Takeuchi<sup>1)</sup>.

- 1) Division of Infection Prevention and Control, Tokyo Healthcare University Postgraduate School
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- 2. The expenses of items used for infection prevention and control in a tertiary university hospital. Rika Yoshida, Hiroyoshi Kobayashi, Takashi Okubo.

Division of Infection Prevention and Control, Tokyo Healthcare University Postgraduate School

### 3. A study on the efficacy of alcoholic hand-rubbings in clinical settings.

Erisa sugawara<sup>1)</sup> Hiroyoshi Kobayashi<sup>1)</sup> Takumi Kajiura<sup>1)</sup> Yoshiro Sogawa<sup>1)</sup> Hirohisa Endo<sup>1)</sup> Chie Takeuchi<sup>1)</sup> Yuhei Saito<sup>2)</sup>

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Poster Session Chairpersons : Okubo T, Kajiura T

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Division of Infection Prevention and Control, Tokyo Healthcare University Postgraduate School

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#### Masashige Sasaki, Hiroyoshi Kobayashi

Division of Infection Prevention and Control, Tokyo Healthcare University Postgraduate School

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## 5. A surveillance on loan instruments in Japan

## Etsuko Okazaki, Hiroyoshi Kobayashi

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## 6. A study on hand hygiene with alcoholic hand rub including fluorescence agent

Tomoko Takemoto, Hiroyoshi Kobayashi, Takashi Okubo, Takumi Kajiura Division of Infection Prevention and Control, Tokyo Healthcare University Postgraduate School

## 7. A study on event-related sterility failure of the sterilization bag

Nobutaka Tsurushima, Hiroyoshi Kobayashi, Takashi Okubo, Takumi Kajiura Division of Infection Prevention and Control, Tokyo Healthcare University Postgraduate School

## 8. Comprehensive review of prion guidelines

Yuhei Saito<sup>1)</sup>, Yushi Uetera<sup>1)</sup>, Toshihiko Obayashi<sup>1)</sup>, Takami Komatsu<sup>1)</sup> Kazuhiko Fukatsu<sup>1)</sup>, Hiroshi Yasuhara<sup>1)</sup>, Takashi Okubo<sup>2)</sup>, Hiroyoshi Kobayashi<sup>2)</sup>

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## ABSTRACTS

#### **Oral Session**

## 1. Interaction between alcoholic antiseptics and chlorhexidine

Yoshiro Sogawa<sup>1)</sup>, Hiroyoshi Kobayashi<sup>1)</sup>, Takumi Kajiura<sup>1)</sup>, Hirohisa Endo<sup>1)</sup>,

Nobutaka Tsurushima<sup>1)</sup>, Etsuko Okazaki<sup>1)</sup>, Tomoko Takemoto<sup>1)</sup>, Noriko Kuruno<sup>1)</sup>,

Yuhei Saito<sup>2)</sup>, Masashige Sasaki<sup>1)</sup>, Erisa Sugawara<sup>1)</sup>, Chie Takeuchi<sup>1)</sup>.

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**Background and Objectives:** One of the major benefits of chlorhexidine (CHG) products in the health care environment is that they demonstrate persistent antimicrobial activity on the skin. After publication of guidelines for hand hygiene in healthcare settings by HICPAC/SHEA/APIC/IDSA, alcoholic hand-rub antiseptic has became widely used for preoperative hand preparation concurrently with CHG scrub products in Japan. However, it has been reported in the US that some alcoholic products containing thickener showed inhibitory action on persistent antimicrobial activity of CHG. Since it had not been investigated whether Japanese alcoholic products had similar effects, we checked the interaction between commercially available Japanese alcoholic antiseptics and CHG when used concurrently.

**Materials and Methods:** After treating with 4% CHG scrub product, three commercially available alcoholic hand gels, one commercially available 76.9-81.4 v/v% ethanol solution, and one experimentally produced alcoholic hand gel containing nonionic thickener were examined. Left forearm of healthy volunteers was scrubbed for 60 seconds with 4% CHG scrub formulation. CHG scrubbing was repeated 5 times. Three circular test sites (2.4cm diameter) were set on the anterior skin of left forearms, and test alcohol gels were applied on two of three test sites. Right forearm was treated in the same manner as left forearm without CHG treatment. After 20 minutes, *E. coli* K 12 (NBRC 3301) suspension was applied on each test site. After 5 minutes, specimens were collected using cup scrub technique from each test site, and were diluted and smeared on trypticase soy agar plates. Colony forming units of each plate were counted after being cultured for 24 hours.

**Results and Discussion:** CHG-treated test sites showed clear persistent antimicrobial activities. However, results from the test sites applied with commercially available alcoholic hand gels showed a complete or partial inhibitory effect on antimicrobial activity of CHG, whereas the test sites applied with the experimentally produced alcoholic hand gel and 76.9-81.4v/v% ethanol solution did not. The commercially available alcoholic hand gels contained an anionic charged polymer as a thickening agent, whereas the experimentally produced alcoholic hand gel contained a nonionic thickener. The results obtained in this study strongly suggest that Japanese commercially available alcohol hand gels also negatively influence persistent antimicrobial activity of CHG, similar to what has been reported in the US. Thus, alcohol products without anionic substances should be chosen for preoperative hand preparation when used concurrently with CHG products.

## 2. Expenses of the items used for infection prevention and control in a tertiary university hospital.

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**Background**: Risk management including infection prevention and control is one of the important strategies for healthcare of good quality, and now in every hospital an effective strategy for infection prevention and control based on the evidence is strongly required. However, the cost-benefit also have to be considered.

**Objective** : To know the expenses of the routine strategies for infection prevention and control.

**Method**: In a tertiary university hospital, during 2007 and 2008 retrospectively, and for two weeks in a ward prospectively in 2009, all the items investigated for infection prevention and control include hand rubs, paper towels, gloves, masks, aprons, gowns, <del>etc</del> and other items used in the hospital have been counted and the average cost has been calculated in each ward for a patent day.

**Results**: The average cost for a patient per day revealed to be greater in 2008 than that of 2007. It suggests that most hospital personnel have become conscious of the precaution procedures.

## 3. Study on the efficacy of alcoholic hand-rubbings in clinical settings.

Erisa sugawara<sup>1)</sup> Hiroyosi Kobayashi<sup>1)</sup> Takumi Kajiura<sup>1)</sup> Yoshiro Sogawa<sup>1)</sup> Hirohisa Endo<sup>1)</sup> Chie Takeuchi<sup>1)</sup> Yuhei Saito<sup>2)</sup>

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**Introduction :** The duration of rubbing has not been established using an alcohol based hand rub, and it is regarded as the drying time for the manufacturer's recommended amount of rub. In clinical settings, smaller amounts of rub and shorter durations are often used for hand hygiene. In this study, we established the optimal amount of rub based on the actual durations of rubbing in clinical settings. We also performed a microbial examination to determine the efficacy of alcoholic hand rubbing.

**Methods :** General hand hygiene practices of healthcare workers were observed for a period of time. The durations of rubbing were set for 3, 7, and 15 seconds based on the results of the observation. The hand sizes were classified into either large (men's glove size: 7.5) or small (women's glove size: 6.5). The amounts of alcohol were determined which evaporated in the aforementioned durations. For large hands, the evaporated alcohol was 0.35 ml for 3 seconds, 1.0 ml for 7 seconds, and 2.0 ml for 15 seconds. For small hands, it was 0.2 ml in 3 seconds, 0.75 ml in 7 seconds, and 1.5 ml in 15 seconds. Alcohol was ethanol for antisepsis with 0.5% glycerin (80% ethanol). The same rubbing method was used for all subjects. The subjects were five healthy adults (two of whom were healthcare providers). They washed their hands with a non-antibacterial soap and evenly applied *Serratia marcescens* ATCC14756 (10<sup>7</sup>/mL, 0.5mL) on their hands and then they were dried. After that, they were told to use the designated amount of the 80% alcohol rub for the designated duration using the same rubbing method. A modified glove juice method was used for bacterial collection, and the bacterial count in each hand was determined. The bacterial count before rubbing was also determined by the same method. The reduction factors (RFs) were calculated and compared among individuals with different durations of rubbing.

**Results :** The RFs (mean<u>+</u>STD) were  $0.59\pm0.44$  for 3 seconds and  $1.85\pm0.45$  for 7 seconds, and  $2.51\pm0.64$  for 15 seconds. When comparisons were made using multivariate analysis which accounted for individual differences, the RF difference between the 3- and 7-second rub was  $1.27\pm0.19$  and between the 7- and 15-second rub was  $0.66\pm0.19$ . These differences were significant using a level of significance of 5%.

**Discussion :** The RF for 15 seconds was expectedly the highest among the rubbing durations of 3, 7, and 15 seconds. It is important to note that the RF difference between 7 and 15 seconds was smaller than that between 3 and 7 seconds. Although the RF difference could have resulted from the difference between healthcare workers experienced in hand rubbing and general subjects, further investigation with a greater number of subjects is necessary.

## ABSTRACTS

#### **Poster Session**

## 1. Contact skin diseases due to ethanol

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**Objectives**: This present study aims to compare Orientals and non-Orientals in the characteristics of contact skin diseases due to ethanol in the previous studies.

Methods : Cases of contact skin diseases due to ethanol were collected from the previous literature. The search involved databases of Ovid MEDLINE(R): 1950 to Sept. Week 2, 2008, CINAHL: 1982 to Sept. Week 3, 2008, and Japana Centra Revuo Medicina: 1983-Sept. 16, 2008. The examination of this study involved 16 reports on 59 Oriental cases and 8 reports on 11 non-Oriental cases.

**Results :** Many cases of the contact skin diseases were occurred among medical personnel, especially among females. Among the Oriental personnel, thirty-eight cases with contact urticaria, eighteen cases with allergic contact dermatitis, and two cases with both of contact urticaria and allergic contact dermatitis were reported. A case with contact urticaria and irritant dermatitis was found. In every eleven cases among the non-Oriental, allergic contact dermatitis was reported. For skin reaction to alcohol intake, the Oriental cases were all positive1 (twenty one / twenty one cases ) but only 37.5% (three / eight cases) of the non-Oriental cases were positive. **Conclusion :** It is considered that many cases of the contact skin diseases due to ethanol were sensitized by high-frequency of contact with ethanol. In the Oriental cases, many non-immune skin reaction due to deficiency of aldehyde dehydrogenase 2 may be included.

## 2. A trial of the "care bundles" in smaller hospitals and clinics

Masashige Sasaki, Hiroyoshi Kobayashi

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The care bundles are simple and easy to utilize in smaller hospitals and clinics. Four care bundle sheets newly developed have been used in forty-nine hospitals. And then they have been clinically studied again in one hundred and fifty-six hospitals after improvement. We gathered data of compliance rate about healthcare worker's essential procedures by using care bundles.

## 3. Sterility assurance programme in Japan

Chie Takeuchi, Hiroyoshi Kobayashi

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**Objectives**: This study examines a change of the actual situation of the sterility assurance in the Japanese clinical settings during the past decade.

**Methods :** A national survey was conducted among 500 institutions with 300 beds or more in 1998, 2002 and 2007. The institutions which replied in both years of 1998 and 2007 were 89 institutions among them. This study has compared the responses of each institution and considered how the Japanese sterile supply department changed during the past decade.

**Results :** The results showed a tendency to entrust outside suppliers with sterile duties (P<0.0001). The ratio of traditional cast use decreased drastically and the ratio of new sterile container use increased gradually. The record of Bowie and Dick test for steam sterilization gradually increased (P<0.0001). It became apparent that the

frequency biological indicator increased after the guideline 2005 for the sterility assurance was published. **Conclusions :** The sterility assurance program in Japan was apparently improved after the publication of Guideline for Sterility Assurance in Clinical Settings.

## 4. A Quantitative evaluation of cleaning efficacy on reprocessed surgical instruments Takako Kami, Hiroyoshi Kobayashi, Takashi Okubo, Takumi Kajiura Division of Infection Prevention and Control, Tokyo Healthcare University Postgraduate School

Cleansing reusable surgical instruments are often difficult after use, and the evaluation of the cleanliness after the cleansing is necessary for the sterility assurance. This study investigates quantitative evaluation of cleaning efficacy of the reprocessed surgical instruments. Applying sheep blood on the surgical instruments, the residual protein is measured by coomassie protein Assay after washing. In some instruments with complicated structures, the residual protein was so often detected. The results of this study suggest that the evaluation of the cleanliness of reusable instruments is routinely necessary to obtain the high quality of sterility after sterilization.

### 5. A Surveillance on the loan instruments in Japan, 2009

Etsuko Okazaki, Hiroyoshi Kobayashi

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The Japanese Association for Operative Medicine (JAOM) published the practical guideline to achieve appropriate surgical operation in 2008. The guideline includes the recommendations on the usage, return, and reuse processes for surgical loan instruments. In order to clarify the current circumstances, second follow-up survey was performed. It was a questionnaire, and 57 institutions returned their response. Since 13 institutions among them responded to the first survey in 2007, statistical comparison was performed. Significant difference was not found in the average restitution duration. Since partial remediation was found in re-processing after usage in the current surveillance, a further investigation will be necessary for entire remediation.

## 6. A study on hand hygiene with alcoholic hand rub including fluorescence agent

Tomoko Takemoto, Hiroyoshi Kobayashi, Takashi Okubo, Takumi Kajiura Division of Infection Prevention and Control, Tokyo Healthcare University Postgraduate School

In clinical settings in Japan, smaller amounts of rub and shorter rubbing time are often used for hand hygiene. This study aim is to measure the applied area of actual hand rubbing using alcohol hand lotion including fluorescence agent.

The amounts of the alcohol hand lotion were assumed for 0.2, 0.5, 1.0, 1.5mL which reflected the actual hand hygiene in the clinical settings. The rubbing time were also assumed for 3, 5, 7, 15 seconds. After implementation of hand rubbing for each conditions using alcohol hand lotion including fluorescence agent, the emission area of each hands were investigated and evaluated.

The results showed that the applied area on hands expanded in response to the rubbing time and the amount of

alcohol hand lotion, it was suggested that this method would be easily evaluated the measurement of applied area on hand of alcohol hand rubbing.

## 7. A study on event-related sterility failure of the sterilization bag

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We can not assume the sterility of package by just looking at it even if it was labeled as "sterilized". In most of the Japanese medical facilities, sterility is guaranteed based on the elapsed time since it was sterilized. But the break of sterility does not occur on the very next day of "expiring date" and can happen way before the "expiring date". Now it is common belief that if some events strong enough to break sterility of the package occur, the sterility can be broken even within the period of guaranteed time span. We investigated variety of events that can jeopardize the sterility of the package such as poor sealing, making holes, and applying pressures.

## 8. Comprehensive review of prion guidelines

Yuhei Saito<sup>1)</sup>, Yushi Uetera<sup>1)</sup>, Toshihiko Obayashi<sup>1)</sup>, Takami Komatsu<sup>1)</sup> Kazuhiko Fukatsu<sup>1)</sup>, Hiroshi Yasuhara<sup>1)</sup>, Takashi Okubo<sup>2)</sup>, Hiroyoshi Kobayashi<sup>2)</sup>

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Creutzfeldt-Jacob disease is caused by a prion, which is strongly resistant to many sterilization and disinfection processes. Other Transmissible Spongiform Encephalopathies (TSEs) are also related to a prion. Preventing iatrogenic transmission of TSEs is a very important task for healthcare facilities. To integrate and summarize information about reprocessing policy of surgical instruments, we reviewed prion guidelines published in several countries.

We searched prion guidelines via internet and listed. We examined them and compared in the table. There are prion guidelines published in the United Kingdom, the European Union, the United States, Canada, and Japan. The World Health Organization has also its published guidelines. There are variations in recommended reprocessing policy or methods by published year. There seems to be transit to simple, available, and cost-effective ones keeping the risk of transmission in the same level. We can consider and organize reprocessing practice against prion diseases in healthcare facilities based on these guidelines. It is important to know prion and TSEs. These guidelines are very good source of information.