INFECTION CONTROL ASSOCIATION (SINGAPORE)

National Infection Control Week 2006 – A Workshop on Hand Hygiene

25 November 2006, 2 pm to 6pm
Changi General Hospital, Lecture Theatre

Speakers:

1. Prof Seto Wing Hong, President, Asia Pacific Society of Infection Control (APSIC)
2. Ms Patricia Ching, Treasurer, APSIC
3. Dr Ling Moi Lin, President, Infection Control Association (Singapore) and Secretary-General of APSIC

1. Clean Care is Safer Care: The Global Patient Safety Challenge - Prof Seto Wing Hong, President of APSIC

The Global Patient Safety Challenge, "Clean Care is Safer Care", aims to raise global and national awareness about the importance of health care-associated infections. The Global Hand Hygiene initiative from the World Health Organization (WHO) is one of the focus in improving hand hygiene standards and practices in health care.

In May 2002, the World Health Assembly passed a resolution to urge countries to pay the greatest possible attention to patient safety and requested the Director-General of WHO to carry out a series of actions to promote patient safety:

i. Development of global norms and standards.
ii. Promotion of evidence-based policies.
iii. Promotion of mechanisms to recognize excellence in patient safety.
iv. Encouragement of research.
v. Provision of assistance to countries in several key areas.

The World Alliance for Patient Safety was proposed in November 2003, with a fundamental purpose to facilitate the development of patient safety policy and practice in Member States. The core functions of the World Alliance for Patient Safety include:

i. Supporting the development of patient safety policy and practice.
ii. Enabling countries to assess their progress on patient safety.
iii. Global reporting.
iv. Solution development.
v. Research and development.

In 27 October 2004, the World Alliance for Patient Safety was launched. The six action areas of the World Alliance for Patient Safety are:

i. Global patient safety challenge. The first Global patient safety challenge covering 2005 and 2006 is health-care associated infection.

ii. Patients advancing patient safety – Aims to mobilize patient groups worldwide, identify and train patient safety champions.

iii. Developing an international taxonomy – Taxonomy for patient safety is to develop high level of international taxonomy, to promote acceptable data standards and to facilitate global exploration of data.

iv. Promoting and coordinating research – Aims to measure patient harm in developed, transitional, and developing countries.

v. Developing solutions – Establish WHO collaborating centers, disseminate and adapt existing solutions and foster international collaboration on new solutions.

vi. Reporting and learning – Produce international guidance, establish compendium of reporting systems, encourage and facilitate reporting and learn from existing information sources.

Healthcare associated infection (HAI) affects millions worldwide every year. As a result of HAI, there remains a concern as; (i) Severity of illness with excess deaths increases, (ii) Prolonged hospital stay, (iii) Long term disability, (iv) Endanger healthcare workers, (v) Massive additional financial burden as a result of HAI, (vi) High costs on patients and their families, and, (vii) Increase in antibiotics resistance.

To help combat the problems of HAI, the Global Patient Safety Challenge 2005-2006, Clean Care is Safer Care aims to develop solutions to improve safety and reduce risk by focusing on five action areas, these are:

i. Clean hands.
ii. Clean practices.
iii. Clean products.
iv. Clean environment.
v. Clean equipment.

Clean hands

Hand hygiene remains the single most important practices to prevent the transmission of infection. It is the most effective way to prevent HAI. In a cluster-randomized study by [1]Luby et al., on the Impact of Hand Hygiene Education in the Community in a Developing Country (rural community in Pakistan), the study revealed a decreased in diarrhea, skin infections, respiratory infections and mortality in children after hand hygiene education and distribution of soap.

Hence the "World Alliance for Patient Safety, Global Patient Safety Challenge 2005-2006. Clean Care is Safer Care" aims in targeting implementation of whole or part of the WHO strategies, one of which being Clean Hands, in the prevention of HAI.

The "WHO Guidelines on Hand Hygiene In Health Care (Advanced Draft) summarizes the following 5 main sections in implementing the WHO Guidelines on Hand Hygiene:
Part 1: Review of scientific data.
Part 2: Consensus recommendations.
Part 3: Outcome measurements.
Part 4: Promoting hand hygiene on a large scale.

[1] Luby et al. Lancet 2005; 366: 225-233

Part 5: Information to the public.

Extracts of the consensus recommendations from the WHO Hand Hygiene Guidelines On Hand Hygiene in Health Care are as follow:

i. Indications to "Perform Hand Hygiene":
   a) Before and after having direct contact with patients ([2]IB).
   b) After removing gloves.
   c) Before handling an invasive device (regardless of whether or not gloves are used) for patient care (IB).
   d) After contact with body fluids or excretions, mucous membranes, non-intact skin, or wound dressings ([3]IA).
   e) If moving from a contaminated body site to a clean body site during patient care (1B).
   f) After contact with inanimate objects (including medical equipment) in the immediate vicinity of the patient (IB).
   g) Wash hands with either plain or antimicrobial soap and water and rub hands with an alcohol-based formulation before handling medication and preparing food (1B).
   h) When alcohol-based hand rub is already used, do not use antimicrobial soap concomitantly ([4]II).

ii. Summary on hand hygiene procedures

Routine care	Aseptic Care of infected patient	Surgical scrub
Hand washing with (non-) antiseptic soap.	Hand washing with soap (e.g. one minute).	Hand / forearm washing with antiseptic soap (3-5 minutes).
Quick hand disinfection with alcoholic hand rub.	Quick hand disinfection with alcoholic rub.	Disinfection with alcoholic rub after hand washing (1x only).
		Note: - Do not do this sequentially.

[2] Category IB. Strongly recommended for implementation and supported by some experimental, clinical, or epidemiological studies and a strong theoretical rationale.
[3] Category IA. Strongly recommended for implementation and strongly supported by well-designed experimental, clinical, or epidemiological studies.
[4] Category II. Suggested for implementation and supported by suggestive clinical or epidemiological studies or a theoretical rationale or a consensus by a panel of experts.

iii. WHO formulation

Formulation 1	Formulation 2
To produce final concentrations of ethanol 80% (V/V), glycerol 1.45%, hydrogen peroxide 0.125%.	To produce final concentrations of isopropyl alcohol 75% (V/V), glycerol 1.45%, hydrogen peroxide 0.125%.
Pour in a 1000ml + 1.0ml graduated flask: • Ethanol 95% V/V 842.0ml • Humectant-like substance: Glycerol 14.5ml • Hydrogen peroxide 3% 41.7ml Top up to 1000.0ml with distilled or boiled water.	Pour in a 1000ml + 1.0ml graduated flask: • Isopropyl alcohol (with a purity of 99.8%) 751.5ml • Humectant-like substance: Glycerol 14.5ml • Hydrogen peroxide 3% 41.7ml Top up to 1000.0ml with distilled or boiled water.

iv. Guide to skin care

a) Select less irritating products.
b) Reduce skin irritation.
c) No provision of antimicrobial soap and alcohol rub concomitantly.
d) Do not hand wash and alcohol hand rub at the same time.
e) No wearing gloves while hands are still wet.
f) Provide alternatives.

v. Guide to use of gloves

a) Does not replace hand cleansing (IB).
b) Wear gloves when contact with blood or other potentially infectious materials, mucous membranes, and non-intact skin ([5]IC).
c) Remove gloves after caring for a patient. Do not wear the same pair of gloves for the care of more than one patient (IB).
d) Change or remove gloves during patient care if moving from a contaminated body site to a clean sit body site within the same patient or to the environment (II).
e) Avoid reuse of gloves (IB). If gloves are reused, implement an adequate reprocessing method to ensure glove integrity and microbiological decontamination (II).

Educational and motivational programmes for health care workers

Focus should be place specifically on factors currently found to significantly influence behavior, and not solely on the type of hand hygiene products. Strategy must be multifaceted and multimodal and include education and senior executive support for implementation (IB).

In summary, the key parameters for success need to include; (a) System change, (b) Education of health care workers, c) Monitoring and feedback of performance, (d) Administrative support, (e) Change in behavior, (f) Associated with reduction in cross transmission and infection rates.

[5] Required for implementation and supported by suggestive clinical or epidemiological studies or a theoretical rationale or a consensus by a panel of experts.

2. WHO Hand Hygiene Implementation In Hospitals: Tools and Evaluation - Ms Patricia Ching, Treasurer of APSIC

Healthcare-associated infections may be caused by pathogen transmission by hands of personnel between two patients or within a same patient.

Proper hand hygiene is the single most effective mean of preventing the transfer of potential pathogen from staff to patient and vice versa. Hand Hygiene promotion is a difficult task as it involve behavioral change, cognitive change – internalization and cultural change.

Implementing the WHO test site and methodology

i. <u>The following criteria to consider when choosing test and control wards</u>
- Type of patients
- Type of care setting
- Intensity of care
- Professional category
- Location
- Representation
- Cooperativeness

ii. <u>Unobtrusive hand hygiene observation</u>
- Trained observers
- Observation for 20-minute sessions
- Include opportunities within visual field
- May observe up to 3 health care workers simultaneously
- May include more health care workers sequentially during one observation session
- Locating a convenient place to observe
- Moves if needed to follow action
- Do not interfere with the observed health care workers during the session.

iii. Recommendations on percentage of auditees based on 200 opportunities per ward, stratified according to ranks

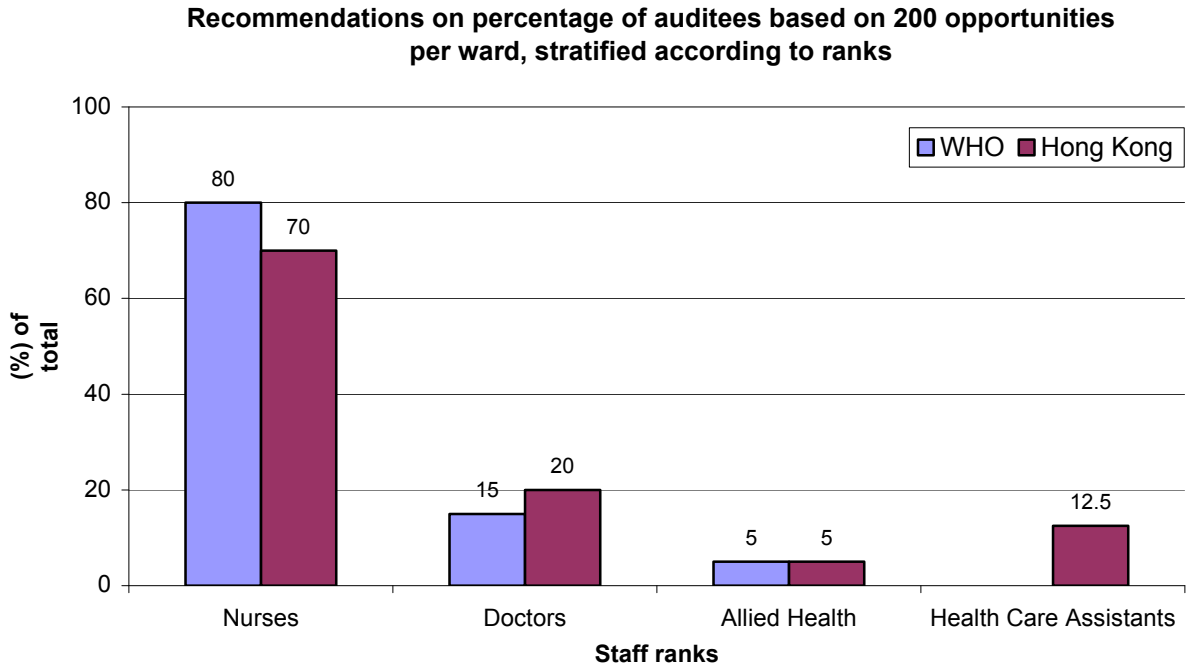

Figure 1 Recommendations on percentage of auditees based on 200 opportunities per ward, stratified according to ranks.

iv. The 5 indications to monitor hand hygiene compliance

1. Before contact with a patient when coming from the hospital environment, figure 2. Examples include; medical examination, helping the patient in his bed, taking blood pressure, dress and undress, shaking hands.

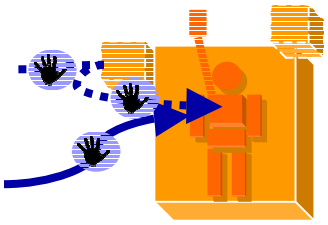

Figure 2 Before contact with a patient.

2. After last of a series of uninterrupted contact with a patient when leaving for the hospital environment, figure 3. Examples include; medical examination, helping the patient in his bed, taking blood pressure, dress and undress, shaking hands.

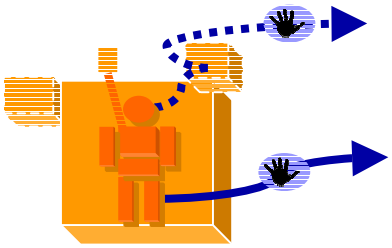

Figure 3 After contact with a patient.

3. After touching objects in the immediate vicinity of the patient, before returning to the hospital environment (without touching the patient). (Apply this only if patient is not touched during the sequence), figure 4. Examples include; adjustment of bedside table, adjustment of infusion, touching the patient monitor.

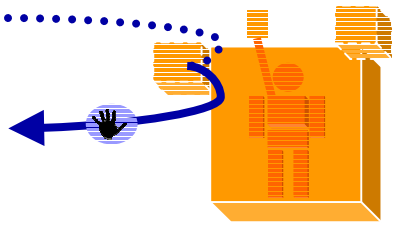

Figure 4 After object.

4. After contact with body fluids. Care tasks with risk of body fluid exposure, independently if an exposure actually occurs or not; often an invasive task; independently of whether gloves are worn or not; Independently of whether there was a prior contact with the same patient or the hospital environment, figure 5. Examples include; emptying a bedpan, blood drawing, tracheal suctioning, wound care, injections (i.m. s.c. i.v.).

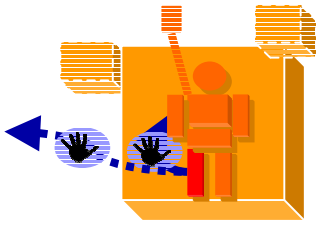

Figure 5 After contact with body fluids.

5. Before clean/invasive procedures, figure 6.

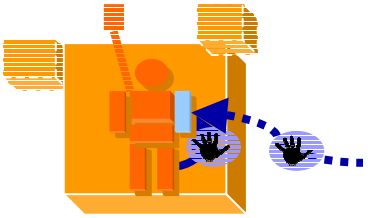

Figure 6 After contact with body fluids.

<u>Other opportunities for hand hygiene include direct transition between 2 patients, figure 7 and 8</u>

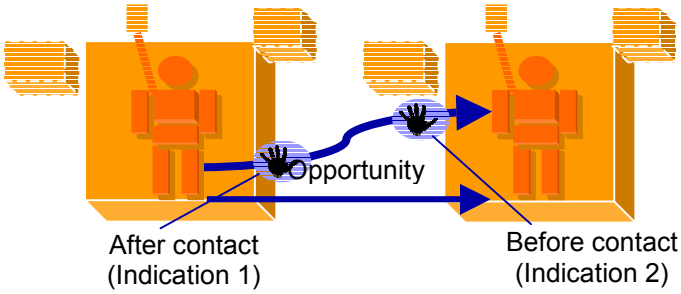

Figure 7 Direct transition.

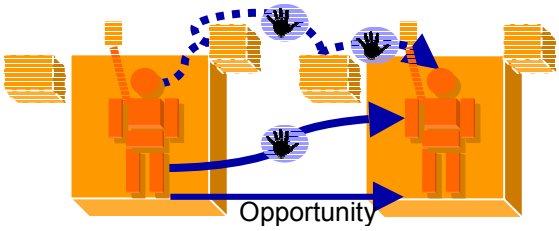

Figure 8 Direct transition.

Additional hand hygiene actions, figure 9

Hand hygiene actions that take place at moments in time when there is no indication for it (according to the 5 indications for hand hygiene). Examples include; hand hygiene action in the corridor.

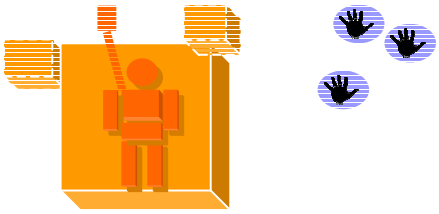

Figure 9 Additional hand hygiene actions.

v. Calculation on hand hygiene compliance

Compliance (%) = (hand hygiene actions / opportunities)*100

vi. Test of hand rub

The following recommended criteria for evaluating hand rub:

- Double-blinded, cross over study.
- At least 40 participants
- Use at least 30ml of product/day
- 3 hand hygiene products: formula A, B and C
- Health care workers will then be:
- Assessed by observer on the 1st and last day.
- Use the product for at least 3 consecutive days.
- Return the bottle to the observer to ascertain usage. Complete a questionnaire.
- Not to use hand lotion or cream during the test periods.

3. Issues - Dr Ling Moi Lin, President of ICA (S) and Secretary-General of APSIC

The following issues relating to hand hygiene were discussed:

- Use of alcohol agent as surgical hand agent.
- Selection of product.
- Glove use and re-use.
- Global implementation of the WHO hand hygiene formulation.
- Religious, cultural and behavioral aspects of hand hygiene.
- Patient involvement in infection prevention, and hand hygiene in particular.
- Communication and campaigning.

i. Surgical hand agent

The objectives in the use of surgical hand agent are to eliminate transient flora and reduce the resident flora. Surgical hand agent also acts in inhibiting the growth of bacteria under gloved hands.

The common agent for surgical hand agent is chlorhexidine gluconate or povidone iodine. Recommended effective formulations consist either 60% to 95% alcohol alone or 50% to 95% alcohol with Quaternary Ammonium Compound (QAC), chlorhexidine gluconate, and hexachlorophene.

As scrubbing frequently may lead to skin damage, alternative such as alcohol agent can be used so long as the product has been tested and proven. When substituting surgical hand scrub with alcohol agent:

- Follow the manufacturer's instructions. Apply the product on dry hands only (IB)
- Do not combine surgical hand scrub and surgical handrub with alcohol-based products sequentially (II)
- Use sufficient product to keep hands and forearms wet with the handrub throughout the procedure (IB)
- After application, allow hands and forearms to dry thoroughly before donning sterile gloves (IB)

ii. Selection of product

When selecting a product, the aim is to choose one with low irritancy potential (1B). Involve a multidisciplinary team, which includes, infection control professionals, administrative staff, pharmacists and behavioral scientists. Feedback should be obtained with regards to the antimicrobial profile of the product and user acceptance. A pilot testing period of 2 to 3 weeks is recommended.

Selection checklist:

- Dermal tolerance and skin reactions.
- Fragrance, color, texture and ease of use.
- Availability, convenience and functioning of dispenser, and ability to prevent contamination.
- Cost issues.
- Global policy for the use of soap and alcohol-based handrubs.
- Relative efficacy of antiseptic agents.
- Selection of products for hygienic hand antisepsis and surgical hand preparation.

iii. Glove use and re-use

It is important that gloves do not replace hand hygiene. Frequent wearing of gloves can increase risk of skin problems and health care workers who wear gloves are less likely to clean their hands. In addition, some health care workers may have allergic reactions with powder.

iv. Global implementation of the WHO hand hygiene formulation

- Final concentrations of ethanol 80% (V/V), glycerol 1.45%, hydrogen peroxide 0.125% (V/V).
- Final concentrations of isopropyl alcohol 75% (V/V), glycerol 1.45%, hydrogen peroxide 0.125% (V/V).

Recommendations to global implementation of the WHO hand hygiene formulation:

- Encourage local production to reduce cost (Current cost approximate S$3.50 to S$4.00).
- Avoid the term ”alcohol” and refer as handrub with antimicrobial properties.
- Pilot in a limited number of sites to evaluate feasibility and acceptability.

v. Religious, cultural and behavioral aspects of hand hygiene

In the Sikhism religion, alcohol is prohibited or considered an offence a penance.

Alcohol Is considered to cause mental impairment in the Hinduism, and alcohol is prohibited in ordinary life but no objection is raised against the use of alcohol-based products for environmental cleaning, disinfection, or hand hygiene (example, the fundamental Hindu textbook, *Shantiparvan*, explicitly stated that it is not sinful to drink alcohol for medicinal purposes).

Buddhism, according to the Law of *Kamma*, the act of the intention to kill living creatures is considered an unskillful act or even a sin. As microorganisms are living beings, killing them with an alcohol-based handrub may lead to demerit[6]. It is, however, not heavy consequences when considering that health care workers for the most part have good intentions in doing what they do, namely to protect patients from pathogen transmission. That is, comparing a human patient’s life with a bacterium’s life, most people adhering to the Buddhist *Kamma* agree that a patient’s life is more valuable.

In Islam, alcohol is clearly designated as *haram* (forbidden) because it is a substance leading to *sukr*, or intoxication leading to an altered state of mind. Taboo has become associated with alcohol for all Muslims; some Muslim health care workers may undoubtedly feel that applying alcohol-containing solutions to their hands may defile their own cleanliness, because they think they have touched a spiritually unclean, *haram* substance. Abstinence from alcohol can have significant benefits on health, however, alcohol as a medicinal agent is clearly permitted with Islam. Any substance that man can manufacture or develop in order to alleviate illness or contribute to better health is permitted by Islam, which is substance is not being used as an agent of *sukr*. For example, cocaine is permitted as a local anesthetic (*halal*, allowed) but is inadmissible as a recreational drug (*haram*, forbidden).

[6]According to Expositor (1:128), 5 conditions for the act of killing are: a living being, knowledge tht it is a being, intention of killing, effort and consequent death.

Quote from 16th meeting of Muslim Scholar Board of the World Muslim League:
"It is allowed to use medicines that contain alcohol in any percentage that may be necessary for manufacturing, if it cannot be substituted. Alcohol may be used as an external wound cleanser, to kill germs and in external creams and ointments."

Mecca, Jan 2002.

[7]Saudi Arabia is the accepted Custodian of the Two Holy Mosques (Mecca and Medina) and spiritual epicenter of Islam. There is no state policy or need for permission to be sought in implementing alcohol handrub. [7]Saudi Arabian National Guard Health Affairs hospitals have mandated the use alcohol handrub since 2003.

Alcohol skin absorption and its smell

There are concerns on potential systemic diffusion of alcohol or its metabolites following dermal absorption or airborne inhalation related to the use of alcohol-based handrub formulations. Quantity of alcohol absorbed in these situations is minimal and well below toxic levels for human beings.

vi. Patient involvement – new in JCAHO 2007 National Patient Safety Goals

The goal is to encourage patients' active involvement in their own care as patient safety strategy.

Requirements to this new initiative are to define and communicate the means for patients and their families to report concerns about safety and encourage them to do so.
Patients need to be fully informed and actively involved in care:

- Detailed information about their condition needs to be given
- They need to clearly understand diagnosis and treatment plan and know what to expect.
- Encouraged to keep doctors informed of any changes in condition, good or bad, such as allergic reaction to a drug.
- They are encouraged to speak up when they have a question about any aspect of their care.
- They are advised not to be afraid to remind friends, family and healthcare providers to wash and sanitize their hands before coming into direct contact with them.

As partners in the development of a safe care plan, they help us consistently do the right thing at the right time for the right person.

Collaborative help in improving compliance can be achieved through patient involvement, however obstacles may also occur as in the case of backfire. Practical actions, such as campaigns and education, can help encourage patient involvement.

[7] Lancet 2006: 367: 1025-7

vii. Responsibilities of the hospital administrators

Hospital administrators play a part in contributing to the success of hand hygiene implementation by:

- Providing health care workers with access to a safe, continuous water supply at all outlets and access to the necessary facilities to perform handwashing (IB).
- Providing health care workers with a readily accessible alcohol-based handrub at the point of patient care, for example, pocket size handrub or at bedside etc) (IA)
- Making improved hand hygiene adherence an institutional priority and provide appropriate leadership, administrative support and financial resources (IB).
- Assigning health care professionals with dedicated time and training for institutional infection control activities, including the implementation of a hand hygiene promotional program (II).
- Implementing a multidisciplinary, multifaceted and multimodal program designed to improve adherence of health care workers to recommended hand hygiene practices (IB).
- With regards to hand hygiene, ensuring that the water supply is physically separated from drainage and sewerage within the health care setting, and provide routine system monitoring and management (IB).
- Making improved hand hygiene adherence a national priority and consider provision of a funded, coordinated and implemented program for improvement (II).
- Supporting strengthening of infection control capacities within healthcare settings (II), such as through infection control professional staffing and funding for initiatives.
- Promoting hand hygiene at the community level to strengthen both self-protection and the protection of others (II). Such as through campaigns involving media, posters, agencies (examples: of anti-smoking, cancer screening, IHI “Save 100K Lives”).

4. Summary

In summary, the success factors to implement hand hygiene are:

- Hand hygiene must be part of an integrated approach with other factors such as environmental hygiene, crowding, staffing levels and education.
- Existence of guideline does not in itself improve hand hygiene. A national drive to assist in the local implementation can be a useful too.
- There is a need for a culture promoting hand hygiene at all levels of society in providing a foundation on which to establish a structure promoting compliance.

The critical success factors for a national program include:

- Drivers for improvement.
- Adaptability of the program.
- Political commitment.
- Policies and strategies that enable spread and sustainability.
- Availability of finance.
- Coalitions and partnerships.
- Local ownership.
- External support agencies.
- Capacity for rapid dissemination and active learning.

- Links to healthcare regulation.
- Economies of scale to be achieved through central production.
- Capacity for public-private partnership working.

What we can do:

- Each hospital and clinic is encouraged to include hand hygiene programs.
- Collaborative may be formed
- Infection Control Association (Singapore) will continue to provide educational programs, public posters.

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