



## KNOWLEDGE OF NURSES WORKING IN BENGHAZI CHEST HOSPITAL REGARDING HAND WASHING

\*Mailud El Amari, \*\*salah mursi, \*HadirGawili, \*\*\*NaemaBargathy, \*\*\*Huda Mohamed, \*\*\*Aisha alferjane  
University of Benghazi- \*Faculty of public health, \*\*faculty of medicine, \*\*\*Faculty of Nursing

### Abstract

Proper hand hygiene is the most important techniques to reduce transmission of pathogen and an effective measure to prevent the incidence of health care associated infection. The paper starts and aims with exploring the knowledge and practice of hand washing hygiene among nursing staff at Kuwefya chest hospital, Benghazi, Libya. The study was conducted including 45 nursing staff in Kuwefya chest hospital were asked to answer a hand washing and hygiene questionnaire developed by WHO (2009). In this context, the questionnaire comprises two sections regarding hand washing knowledge and practice. The collected data was analysed using the SPSS software program. The study has shown that the knowledge on hand hygiene was positive in general, among the total study population. Most of nursing staff had poor attitudes about hand hygiene. As the results show, hand hygiene influenced knowledge, attitude and practice of nurse workers awareness and encourages them to comply with hand hygiene situations. This paper proposes regarding hand hygiene, the staff had good knowledge but overall poor attitudes and practices. The present study underscores the need to improve the existing training programs in KCH to address the gaps regarding hand hygiene.

**Key words:** Hand washing, awareness, nursing.

## Knowledge of nurses working in Benghazi chest hospital regarding hand washing

\*Mailud El Amari, \*\*salah mursi, \*HadirGawili, \*\*\*NaemaBargathy, \*\*\*Huda Mohamed, \*\*\*Aisha alferjane

University of Benghazi- \*Faculty of public health, \*\*faculty of medicine, \*\*\*Faculty of Nursing

### Introduction

Hand hygiene is the most important tool in preventing the transmission of nosocomial infections and to reduce the risk of transmission of blood borne and other pathogens. All of which make the hands to be constantly contaminated. The frequency of contaminated hands that are central to many of our daily activities like cooking, handling objects etc, suggest that hand hygiene is one of the most important element of infection control activities. There is enough scientific evidence supports the observation that if properly implemented, hand hygiene alone can significantly reduce the risk of cross transmission of infection in healthcare facilities (*Mathur, P. 2011*).

Hand washing is the most effective way of preventing the spread of infectious diseases. But despite a Joint Commission requirement that Centers for Disease Control and Prevention hand hygiene guidelines be implemented in hospitals, compliance among health care workers remains low. The reasons of lack of compliance to hand washing include: lack of appropriate equipment, low staff to patient ratios, allergies to hand washing products, insufficient knowledge among staff about risks and procedures, the time required and casual attitudes among healthcare workers (HCWs) towards bio-safety (*Pittet 2006*).

To address this problem, continuous efforts are being made to identify effective and sustainable strategies. This concept has been aptly used to improve understanding, training, monitoring, and reporting hand hygiene among healthcare workers. The importance of hands in the transmission of hospital infections has been well demonstrated, and can be minimized with appropriate hand hygiene. However, compliance with hand washing is frequently suboptimal.

Health care workers especially nursing staff are at risk of acquiring infection through occupational exposure. To prevent nosocomial infection, the maintenance of a high degree of hygiene in hospital settings is necessary. Effective hand hygiene is the simplest proven method to reduce the prevalence of health care-associated infections. Unfortunately, the prevalence of these infections continues to rise, and it is estimated that annually about hundreds of millions of patients suffer from health care-associated infections the world over. Therefore, infection control is necessary to reduce the high levels of health care-associated infections, and the importance of hand hygiene in the control of infection cannot be overemphasized of hand cleansing by using water and detergent and/or the use of alcohol-based hand sanitizers for the removal of transient microorganisms from hands (*Pittet D, 2009*).

Although many communities have guidelines on hand hygiene for health care settings, many researchers have found that measuring adherence to the hand hygiene guidelines is not a simple task. Experts in quality improvement have suggested that a multidisciplinary strategy is necessary to improve hand hygiene, including protocols, training, engineering controls and equipment, and routine observation and feedback. Most would agree that hand hygiene is of critical importance, but numerous studies have shown that adherence to hand hygiene recommendations remains low and that improvement efforts frequently lack sustainability. This is may be due to several constraints such as heavy work load, high number of clinical procedures, and skin conditions of health care workers (*Nabavi, M, 2015*).

The hands are central to many of our daily activities like handling objects, eating, cleaning etc, makes possible to transmit the contaminants microorganism pathogens into body through food, thereby causing illness.

There are two types of microbes colonizing hands; the resident flora, which consists of microorganisms residing under the superficial cells of the stratum conium and the transient flora, which colonizes the superficial layers of the skin, and is more amenable to removal by routine hand hygiene. Transient microorganisms survive, but do not usually multiply on the skin. They are often acquired by healthcare workers during direct contact with patients or their nearby contaminated environmental surfaces and are the organisms most frequently associated with health care associated infections (HCAIs) (*WHO, 2010*).

The hands of healthcare workers are commonly colonized with pathogens like methicillin resistant *S. aureus* (MRSA), vancomycin resistant enterococcus (VRE), multi-drug resistant (MDR)-germ negative bacteria (GNBs), candida spp and clostridium difficile, which can survive for as long as 150 hours. Skin epithelial cells containing viable microorganisms are shed daily from the normal skin, which can contaminate the gowns, bed linen, bedside furniture, and other objects in the patient's immediate environment. Hand carriage of resistant pathogens has repeatedly been shown to be associated with nosocomial infections (Magiorakos AP, 2009).

The highest rates of hand contamination are reported from critical care areas, which also report most cases of cross transmission. The hands may become contaminated by merely touching the patient's intact skin or inanimate objects in patients' room or during the cleaning procedures like recording blood pressure (*WHO, 2010*).

The aim of this study is to explore the knowledge of nursing staff regarding hand washing practice. However, the objectives of study were; the personal characteristic of nurses in Kuwefya chest hospital, the importance of hand washing practice to reduce common infectious among nursing staff and environmental knowledge of nurses practice regarding hand washing.

Hand hygiene practice of healthcare workers has been shown to be an effective measure in preventing hospital acquired infections. It has been the practice, which keeps the hands free from pathogens or decrease the amount prior to any procedure or touching the patient. Hand hygiene prevents cross infection in hospitals, but HCWs adherence to hand hygiene is poor. Easy, timely access to both hand hygiene and skin protection is necessary for satisfactory hand hygiene behaviour (pittet, 2011).

The significance of hand washing in patient care was pictured in the early 19<sup>th</sup> century. According to *Labarraque* the first evidence that hand decontamination can markedly reduce the incidence of puerperal fever and maternal mortality.

Hand hygiene compliance rates among HCWs rarely exceeds 50% contact precaution are thought to increase HCWs hand hygiene awareness (*Gilbert, 2010*). Health Care Associated infections (HCAIs) are the major cause of morbidity and mortality. Hand hygiene is an effective preventive measure (*Gould, 2010*).

Hospital acquired infections possess a very real and serious threat to all who are admitted in hospitals. Pathogens are readily transmitted through the hands of HCWs, and hand hygiene substantially reduces the chance this transmission. Evidenced based guidelines for HCWs, hand hygiene practice exists, but compliance with these are internationally low (*Creedon, 2005*).

Transmission of microorganisms from the hands of HCWs is the main source of cross infection in hospital and can be prevented by hand washing. Compliance with hand washing is moderate. Variation across hospital wards and types of HCWs suggests that targeted educational programme may be useful. The association between non-compliance and intensity of care suggest that under staffing may decrease the quality of patient care. (Pittet, 1999). Nosocomial infections are a leading complication in ICUs. Although hand hygiene is the single most efficient preventive measure, compliance with simple action remains low. Nosocomial infection can be transmitted from microorganisms on the hand of HCWs to patients. Hand Washing has a proven benefit in preventing transmission of infection, yet compliance with hand washing, especially in intensive care unit is very important (Lipsett, 2011)

In 1950s, study showed that direct contact was the main mode of transmission of *S. aureus* in nurseries. They also demonstrated that hand washing by patients' contacts reduced the level of *S. aureus*. In 1975 and 1985, the CDC published guidelines on hand washing practices in hospitals, primarily advocating hand washing with non-antimicrobial soaps; washing with antimicrobial soap was advised before and after performing offensive procedures or during care for high risk patients. Alcohol based solutions were recommended only in situations where sinks were not available (Rotter ML, 1997).

Health care associated infections (HAIs) affect 1.4 million patients at any time worldwide, as estimated by the World Health Organization. In Intensive Care Units, the burden of HAIs is greatly increased, causing additional morbidity and mortality. Multidrug resistant pathogens are commonly involved in such infections and render effective treatment challenge. Proper hand hygiene is the single most important, simplest, and least expensive means of preventing HAIs.

According to Centers for Disease Control and Prevention and WHO guidelines on hand hygiene in health care, alcohol – based hand rub should be preferred means for routine hand antisepsis (Tschudin-sutter et al. 2010)

The WHO save lives clean your hands programme reinforces the 'My 5 moments for hand hygiene' approach as key to protect the patients, healthcare workers and healthcare environment against the spread of pathogens and thus reduce HAIs. This approach encourages healthcare workers to clean their hands; before touching the patient, before clean/aseptic procedures, after body fluid exposure, after touching the patient and the surrounding area.

## Methods:

This is a cross-sectional descriptive study conducted between 2016 and 2017 among nursing staff in Kuwefya chest hospital (KCH), designed to explore the knowledge, attitude, and practice of hand washing including hand drying methods as well as identify factors that motivate and/or work against hand washing practices by nurses.

The study was conducted among 45 nursing staff in Kuwefya chest hospital were working as full time who agree to participate at the time of data collection.

A self – administered regarding hand hygiene practice among nursing staff were asked to answer a questionnaire developed by WHO (2009) with additional demographic and educational questions. The questionnaire comprises two sections regarding hand washing knowledge and practice. One consisted of demographic data including age, marital status, educational level and the years of experience. The other section contains information regarding hand washing knowledge and practice among nursing staff in KCH.

Ethical approval for the study was obtained from the hospital after directing a permission letter from the faculty of nursing with agreement of each nurse participating immediately and distribution of the questionnaire after describing about the purpose of the paper.

The collected data was entered into the computer and analysed by using SPSS version 22 software program and percentages were used to express the results. To maintain anonymity, the names and the personal identification of the participants were not mentioned or even analysed.

## Results:

Table (1) The main general characteristics of participants (n = 45)

Characteristics of participants	No.	%
<b>Gender</b>		
Male	1	2.2
Female	44	97.8
<b>Age</b>		
20-29	15	33.3
30-39	19	42.2
40>	11	24.4
<b>Marital status</b>		
Single	22	48.9
Married	20	44.4
Divorce	2	4.4
No answer	1	2.2
<b>Educational level</b>		
University	8	17.8
High Institute	16	35.6
Short courses	4	8.9
Intermediate	15	33.3
No answer	2	2.2
<b>Experience of nursing work</b>		
Less than 10 years	19	42.2
10-20 years	21	46.7
More than 20 years	5	11.1

The present study included 45 nursing staff participants of *Kuwefya chest hospital* who agreed to participate in this study. Most of them are females 97.8% were of age less than 40 years.

Marital status, 48.9% of the participants were single with high diploma education 35.2% and 2.2% of the sample population did not answer about their educational level. Most of participants 46.7% have work experience of 10-20 years in nursing practice.

## Knowledge

Table (2) Show knowledge of study participant regarding hospital infection and infection transmission.

Knowledge		No.	%
Knowledge of nosocomial infection	Yes	39	86.7
	No	6	13.3
Knowledge of nosocomial infection control in hospital	Yes	38	84.4
	No	7	15.6
Measurements of infection control in the hospital	Yes	39	86.7
	No	6	13.3
Did you receive a formal training in hand hygiene last year?	Yes	39	86.7
	No	6	13.3
Which of the following is the main route of cross-transmission of potentially harmful germs between patients in healthcare facility?			
• Healthcare workers when their hands not clean		17	37.8
• Air circulation in the hospital		4	8.9
• Patients exposure to colonized surfaces		15	33.3
• Sharing non-invasive objects i.e. Stethoscopes		9	20

The of nursing hand practice and nosocomial shows that good

knowledge staff about washing related to infection, all have knowledge.

84.6% - 86.7% of the participants have knowledge about nosocomial infection in hospital and measurements of how to control. 86.7% of sample members have attended last year training course about hand hygiene as a job training program. However, 13.3% - 15.6% have a lack of knowledge about nosocomial infection out and those who did not attend the training course last year.

## Attitude

Table (3) show the attitude of participants toward nosocomial infection

Attitude		No.	%
What is the most frequent source of germs responsible for healthcare associated infections?	Hospital's water system	2	4.5
	Hospital's air environment	8	18
	Germs already present on within the patient	21	47.7
	Hospital environment surfaces	13	29.5
Which of the following hand hygiene actions prevent transmission of germs to patient: • Before touching the patient	Yes	36	80
	No	1	2.2
	No answer	8	17.8
• Immediately after exposure to body fluid	Yes	24	53
	No	3	6.6
	No answer	18	40
• Immediately before clean/aseptic procedure	Yes	27	60
	No	2	4.4
	No answer	16	35.5
• After exposure to patient	Yes	24	53.3
	No	6	13.3
	No answer	15	33.3
• Hand washing and hand rubbing are recommended to be performed in sequence	Yes	31	73.8
	No	10	23.8
	No answer	1	2.3
Which of the following should be avoided as associated with increase colonization on hands with germs?			
• Wearing jewellery	Yes	27	71
	No	9	23.6
	No answer	2	5.2
• Damaged skin	Yes	34	87.1
	No	4	10.2
	No answer	1	2.5
• Artificial fingernails	Yes	32	86.4
	No	3	8.1
	No answer	2	5.4
• Regular use of hand cream	Yes	21	56.7
	No	14	37.8
	No answer	2	5.4

Most frequent source of germs present come from patients 47.7% of participants are aware. The attitude of doing hand washing before touching the patient 80% of the participants do it while before doing aseptic procedure about 60%.

Immediately after exposure to body fluid of patient, 53% doing hand washing practice. Almost all of sample members doing hand washing and hand rubbing as recommended to be performed in sequence were 73.8%.

Wearing jewellery during working time 71% consider it as should be avoided while about one fourth do not think so. Looking at the practice skills of these nurses, it appears that nearly half of participants do not go for hand rubbing /hand cleaning.

### Practice

Table (4) Show the practical skills of participants regarding methods of hand washing.

Practice		No.	%
Use the hand washing during work	Yes	37	84.09
	No	7	15.9
Hand rubbing is more rapid for hand cleansing than hand washing	Yes	27	61.3
	No	17	38.6
Hand rubbing causes skin dryness more than hand washing	Yes	33	80.4
	No	8	19.5
Hand rubbing is more effective against germs than hand washing	Yes	24	55.8
	No	19	44.18
What is the minimal time needed for alcohol based hand rub to kill most germs on your hands?	1 minute	20	46.5
	20 seconds	11	25.5
	10 seconds	5	11.6
	3 seconds	7	16.2
Which type of hand hygiene method is required in the following situations • Before palpation of the abdomen	Rubbing	20	47.6
	Washing	18	42.8
	None	4	9.5
• Before giving an injection	Rubbing	22	51.1
	Washing	15	34.8
	None	6	13.9
• After emptying a bed pan	Rubbing	12	28.5
	Washing	28	66.6
	None	2	4.7
• After removing examination gloves	Rubbing	12	28.5
	Washing	28	66.6
	None	2	4.7
• After making a patient's bed	Rubbing	13	30.9
	Washing	28	66.6
	None	1	2.3
• After visible exposure to blood	Rubbing	15	35.7
	Washing	26	61.9
	None	1	2.3



In comparison hand cleansing and hand washing, hand rubbing is more rapid for hand cleaning than hand washing 61.3% agreed and most of them says hand rubbing causes skin dryness more than hand washing with 80.4%. Hand rubbing is more effective against germs than hand washing with 55.8% say yes with minimal one minute needed for alcohol base hand rub 46.5%.

We recognize also in which type of hand hygiene method is required in most situation is hand washing than rubbing. In situation they prepare hand washing after emptying bed pan, after removing gloves, after making patient's bed with 66.6%, but in a situation need aseptic technique like giving medication hand rubbing is preferable by the participant with 51.1%.

## Discussion

Hand hygiene is the most important tool in preventing the transmission of nosocomial infections, especially if we consider the HCWs are the most common mode of transmission of pathogens to patients. However, factors that contribute to poor adherence to hand hygiene include poor access to hand washing facilities (sinks, soap, disinfectants), the time required to perform standard hand washing, irritant contact dermatitis associated with frequent exposure to soap and water, high workloads, knowledge deficits among HCWs, and the failure of administrative leaders to make hand hygiene practice an institutional priority.

In our study, analysis of the responses showed that nursing staff had a good knowledge on hand hygiene, though this was a positive finding and major gaps in the knowledge were identified. For instance, a 5.6% of the participants did not attain the last year training program in related subjects (Table 1), 13.3% - 15.6% of the sample were have lack of knowledge about nosocomial infection. This is like the finding in a previous study done by *Sasidharan et al.* where nursing students 52.1% showed better attitudes than medical students 12.9%. This major gap in the knowledge were identified which should be addressed during the future training sessions, especially for nursing staff.

Regarding the study nursing staff attitude toward hand hygiene. The attitude of doing hand hygiene before touching patients has 80% of participants do it, while before doing aseptic cleaning procedure for patient 60% only (Table 3). The gap was 20% of doing hand hygiene before touching patients. This could be due to the lack of facilities in our institution and could be overcome by setting up bedside hand rubs, maintaining the patient to sink ratio etc. The attitude is good but to fill up the gap of 20-40%, which still need to resolve. In a study done by *Sasidharan et al* where nursing students showed better attitudes (52.1%) than medical students (12.9%). Both the groups agreed that they missed out hand hygiene sometimes because they had more important works to attend, which showed that hand hygiene, was not in their priority. Such practical problems like inadequate supply of hand rub solutions, difficult access to wash basins, are to be considered as this could be one of the reasons for the gap.

**Conclusion:**

Washing hands can prevent the spread of germs, including those that are resistant to antibiotics and are becoming difficult, if not impossible, to treat. Practicing hand hygiene is a simple yet effective way to prevent infections. Nursing staff, clean their hands less than half of the times they should. Hence it is important that Healthcare facilities need special regular updates and training programs on skills for all their health care personnel on knowledge and prevention the transmission of nosocomial infections, with continuous monitoring and performance feedback to encourage them to follow correct hand hygiene practice.. To the best of our knowledge, there is currently no systematic study on hand hygiene promotion and evaluation in health establishments in Libya. As a developing country, Libya has yet to collect information to study, how hand hygiene compliance and the affects rates of health care-associated infections specially in hospitals. Previous, unpublished observations in hospitals have indicated that hand hygiene compliance is poor among hospital staff. Moreover, KCH should improve hand washing practices by improve training programs, to address the gaps in knowledge, attitude and practices, and provide adequate supply of hand rub solutions and access to wash basins needed for hand hygiene practice. Hand washing was higher after patient contact than before. Busy work schedule in between patient care was identified as a possible constraint.. Our emphasis on the importance of hand washing before and after contact with patients. Electric warm air hand dryers and single use disposable paper towels should be provided in the wards.



## References

- Allegranzi B, Storr J, Dziekan G, Leotsakos A, Donaldson L, Pittet D. (2007): The First Global Patient Safety Challenge “Clean Care is Safer Care”: from launch to current progress and achievements. *J. Hosp. Infect.* 65(Suppl 2):115–23.
- Boyce JM, Pittet D. Guideline for Hand Hygiene in Health-Care Settings. Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. *Morb Mortal Wkly Rep.* 2002;51:1–44.
- Centers for Disease Control and Prevention. Materials to promote hand hygiene in your healthcare facility. Accessed at [www.cdc.gov/handhygiene/materials.htm](http://www.cdc.gov/handhygiene/materials.htm).
- Centers for Disease Control and Prevention. Methicillin-resistant *Staphylococcus aureus* infections in correctional facilities—Georgia, California, and Texas, 2001–2003. *MMWR Morb Mortal Wkly Rep* 2003;52:2992–6.
- Daniels IR, Rees BI. Handwashing: simple, but effective. *Ann R Coll Surg Engl.* 1999;81:117–8.[PMC free article]
- Garner JS, Favero MS. CDC guideline for handwashing and hospital environmental control, 1985. *Infect Control.* 1986;7:231–43.
- Guide to implementation of the WHO multimodal hand hygiene improvement strategy. [accessed on August 24, 2010]. Available from: <http://www.who.int/patientsafety/en/>
- Hospital Infection Control Practices Advisory Committee (HICPAC) Recommendations for preventing the spread of vancomycin resistance. *Infect Control HospEpidemiol.* 1995;16:105–13.
- Kampf, G., & Kramer, A. (2004). Epidemiologic Background of Hand Hygiene and Evaluation of the Most Important Agents for Scrubs and Rubs. *Clinical Microbiology Reviews*, 17(4), 863–893. <http://doi.org/10.1128/CMR.17.4.863-893.2004>
- Kilpatrick C, Allegranzi B, Pittet D. The global impact of hand hygiene campaigning. *Euro Surveill.* 2009;14:ii–19191.
- Labarraque AG. Instructions and observations regarding the use of the chlorides of soda and lime. In: Porter J, editor. New Haven, CT: Baldwin and Treadway; 1829.

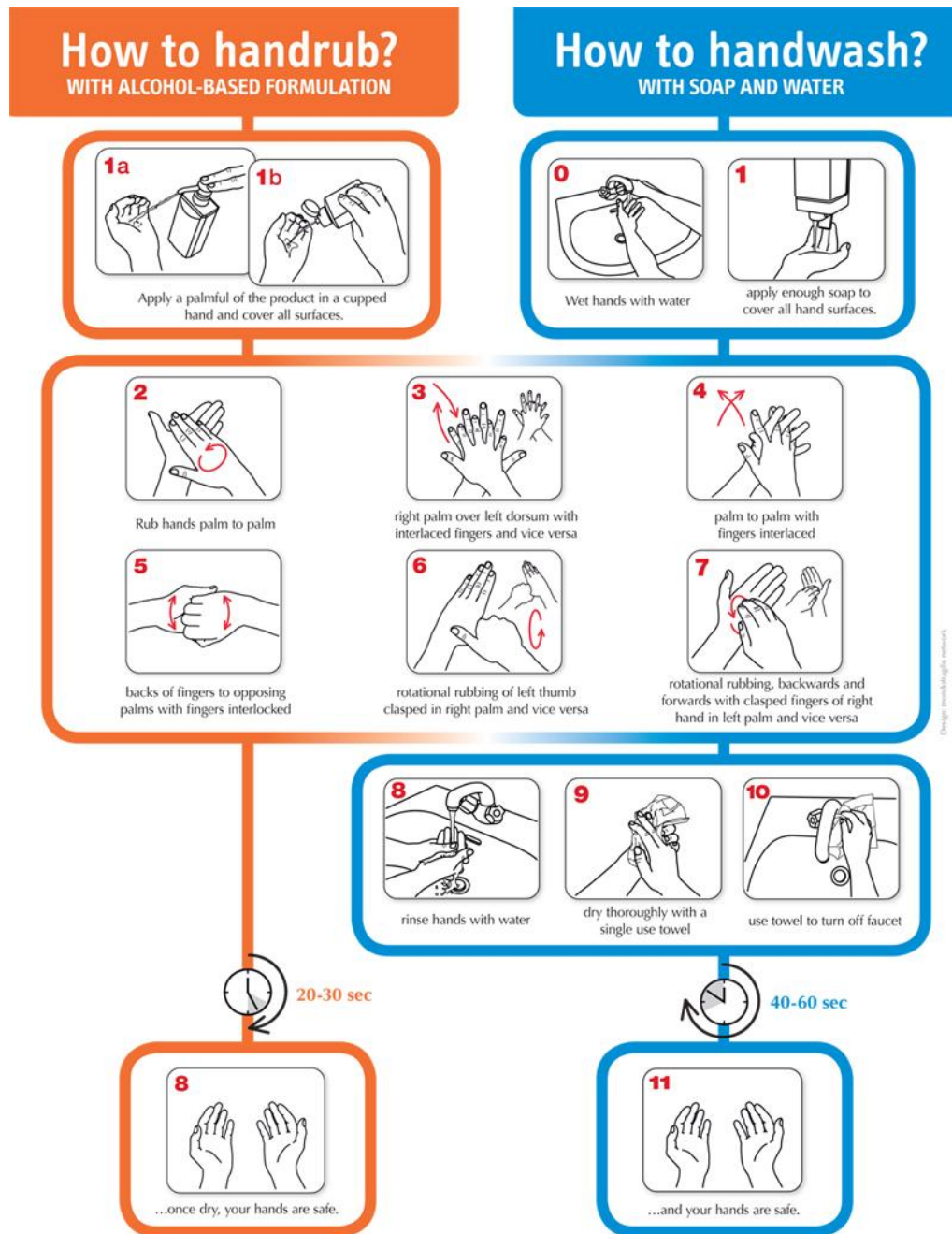
- Magiorakos AP, Suetens C, Boyd L, Costa C. National Hand Hygiene Campaigns in Europe, 2000-2009. *Euro Surveill.* 2009;14:ii–19191.
- Mathur, P. (2011). Hand hygiene: Back to the basics of infection control. *The Indian Journal of Medical Research*, 134(5), 611–620. <http://doi.org/10.4103/0971-5916.90985>.
- Nabavi, M., Alavi-Moghaddam, M., Gachkar, L., & Moeinian, M. (2015). Knowledge, Attitudes, and Practices Study on Hand Hygiene Among Imam Hossein Hospital's Residents in 2013. *Iranian Red Crescent Medical Journal*, 17(10), e19606. <http://doi.org/10.5812/ircmj.19606>
- Nair, Sreejith Sasidharan et al. (2014). Knowledge, Attitude, and Practice of Hand Hygiene among Medical and Nursing Students at a Tertiary Health Care Centre in Raichur, India. *ISRN Preventive Medicine*, 2014, 608927. <http://doi.org/10.1155/2014/608927>
- Noble WC. Dispersal of skin microorganisms. *Br J Dermatol.* 1975;93:477–85.
- Pratt RJ, Pellowe C, Liveday HP, Robinson N, Smith GW, Barrett S. The EPIC project: developing national evidence- based guidelines for preventing healthcare associated infections. *J Hosp Infect.* 2001;47(Suppl A):S3–82.
- Role of airborne transmission in staphylococcal infections. Mortimer EA Jr, Wolinsky E, Gonzaga AJ, Rammelkamp CH Jr *Br Med J.* 1966 Feb 5; 1(5483):319-22.
- Rotter ML. 150 years of hand disinfection-Semmelweis' heritage. *Hyg Med.* 1997;22:332–9.
- Steere AC, Mallison GF. Handwashing practices for the prevention of nosocomial infections. *Ann Intern Med.* 1975;83:683–90.
- Stone SP. Hand hygiene: the case for evidence-based education. *J R Soc Med.* 2001;94:278–81.
- The Society for Healthcare Epidemiology of America/Association for Professionals in Infection Control/Infectious Diseases Society of America. *MMWR Recommend Rep.* 2002;51:1-45, quiz CE1-4.
- WHO guidelines for hand hygiene in health care (Advanced draft) Geneva: WHO; 2006. [accessed on August 24, 2010]. World Health Organization. Available from: <http://www.who.int/gpsc/tools/en/>





FamilyHealth





WHO acknowledges the Hôpitaux Universitaires de Genève (HUG), in particular the members of the Infection Control Programme, for their active participation in developing this material.



October 2006, version 1.