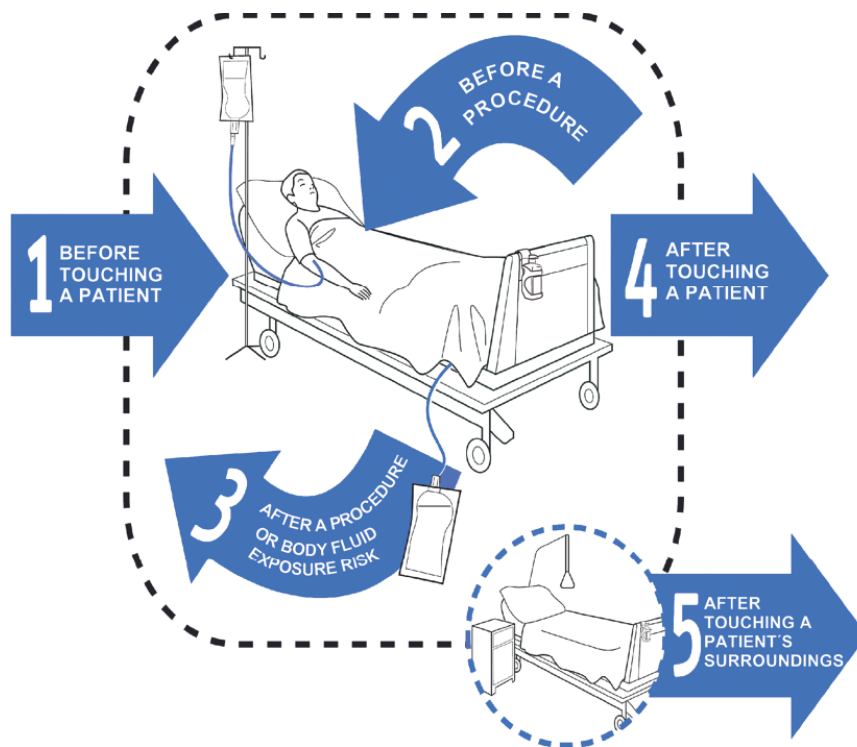




**Hand Hygiene Australia**  
[www.hha.org.au](http://www.hha.org.au)

# 5 Moments for HAND HYGIENE



November 2010

Edited by: Prof. M. Lindsay Grayson, Philip Russo,  
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This Program and manual have been developed by the National HHA Team.

This manual should be read in conjunction with the [Australian Guidelines for the Prevention and Control of Infection in Healthcare](#)

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# Foreword

Improving hand hygiene (HH) among healthcare workers (HCW) is currently the single most effective intervention to reduce the risk of healthcare associated infections in Australian hospitals. Although improving HH compliance seems an obvious and intuitive idea, changing attitudes and behaviour among HCWs in a healthcare system that for decades has not emphasised the importance of HH requires a major change in HCW culture and education. Instituting and sustaining culture-change among humans is always a challenging task, but recent Australian and international studies have shown that, given the right approach, Australian HCWs have readily adopted HH culture-change and the increased use of alcohol-based hand rub in their healthcare practice. These changes in attitudes and behaviour have resulted in a greater than 50% reduction in the rates of hospital acquired infection associated with methicillin-resistant *Staphylococcus aureus* (MRSA) and other multi-resistant pathogens in some States after just 1-2 years. Until recently, many Australian medical and nursing schools did not have education regarding alcohol-based hand rub and the importance of HH compliance as components of their curricula – clearly there is a lot to do in achieving sustainable HH culture-change. Nevertheless, a systematic approach can be taken with HH culture-change in which not only HCWs, but the entire Australian community, places a greater importance on good HH as a crucial means of controlling disease transmission. Excellent HH compliance needs to become one of the key indicators of whether a hospital delivers good healthcare and becomes an integrated feature of the Australian healthcare system.

The National Hand Hygiene Initiative is a first step in instituting nationwide HH culture-change. Hand Hygiene Australia (HHA) has the responsibility of coordinating this national program that we hope will soon result in major improvements in HH and disease reduction, and the eventual embedding of HH as a key component of how we judge healthcare quality.

This manual outlines in a clear and systematic manner the HHA approach to HH culture-change in Australia. It builds on the highly successful programs recently conducted in Australia and by the World Health Organization. Integration of the WHO “5 Moments” program into the HHA program allows Australian HCWs and hospitals to benchmark their rates of HH compliance both nationally and internationally and helps to ensure that Australian healthcare is of a truly international standard.

This manual does not aim to provide an in-depth analysis of infection control or be a textbook on infectious diseases. Instead, it provides a practical step-by-step guide to implementing HH culture-change in your hospital and how to participate in the HHA national HH program. We hope that it helps your hospital to provide even better healthcare to your patients and the Australian community.

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# Chapter 1

## Introduction

This manual should be regarded as part of the toolkit for implementing the National Hand Hygiene Culture Change program. It contains recommendations based on the [WHO Guidelines on Hand Hygiene in Health Care](#) (1) and has been modified for the Australian setting. It is not designed to serve as a regulatory requirement, but to act purely as a guideline for the Australian healthcare sector to improve Hand Hygiene compliance and ultimately reduce healthcare associated infections.

This manual does not address surgical hand hygiene. Alcohol based hand rubs (ABHRs) for surgical procedures are not addressed within the scope of the HHA agenda. Please refer to the WHO Guidelines on Hand Hygiene in Health Care (1) for further information.

HHA is committed to ensuring that the 5 Moments for Hand Hygiene Manual is updated every 2 – 3 years.



## 1.1 Historical Perspective on Hand Hygiene in Health Care

Handwashing with soap and water has been used to improve personal hygiene for centuries; however the link between handwashing and the spread of disease was only established in the mid 1800s. An Austrian doctor, Ignaz Semmelweis, is considered to be the first person who established that hospital acquired diseases were transmitted via the hands of healthcare workers (HCW). Since then there have been many further investigations that have confirmed the important role that contaminated hands play in the transmission of health care associated pathogens. Since 2002, the Healthcare Infection Control Practices Advisory Committee (HICPAC) guidelines (2) defined alcohol based hand rub, where available, as the standard of care for hand hygiene practices in health care settings, whereas handwashing is reserved for particular situations only.

## 1.2 Transmission of pathogens by hands

Transmission of health care associated pathogens from one patient to another via HCWs' hands requires five sequential steps (1-2):

- i. Organisms are present on the patient's skin, or have been shed onto inanimate objects immediately surrounding the patient
- ii. Organisms must be transferred on the hands of HCWs
- iii. Organisms must be capable of surviving for at least several minutes on HCWs' hands
- iv. Hand hygiene (HH) by the HCW must be inadequate or entirely omitted, or the agent used for hand hygiene inappropriate
- v. The contaminated hand or hands of the caregiver must come into direct contact with another patient or with an inanimate object that will come into direct contact with the patient.

## 1.3 The Hand Hygiene Problem

Poor Hand Hygiene (HH) practice among Health Care Workers (HCWs) is strongly associated with healthcare associated infection transmission and is a major factor in the spread of antibiotic-resistant pathogens within hospitals (2-3). Despite this, efforts to improve the rate of HH compliance have generally been ineffective or their efficacy poorly sustained. Numerous barriers to appropriate HH have been reported (4-6) including:

- HH agents causing skin irritation and dryness
- Patient needs perceived to take priority over HH
- Hand washing sinks/basins inconveniently located and/or not available
- The perception that glove use dispenses with the need for additional HH
- Insufficient time for HH, due to high workload and understaffing
- Inadequate knowledge of guidelines or protocols for HH
- Lack of positive role models and social norms
- Lack of recognition of the risk of cross-transmission of microbial pathogens
- Until recently, lack of scientific information showing a definitive impact of improved HH on HCAI rates
- Simple forgetfulness.

## 1.4 The Solution to Decrease Health Care Associated Infection

There is convincing evidence that improved hand hygiene can reduce infection rates. More than 20 hospital based studies (including systematic reviews) of the impact of hand hygiene on the risk of healthcare associated infection have been published between 1977 and 2008 (7). Despite study limitations almost all reports showed an association between improved hand hygiene practices and reduced infection and cross transmission rates.

It is important to note that although the introduction of an alcohol based hand rub was a key factor to improvement in nearly all the studies, the available evidence highlights that the success of improved hand hygiene compliance and reduced healthcare associated infection results from the overall effect of the multimodal hand hygiene promotion strategies (1).



**Recent research (1-2) has demonstrated that ABHRs are better than traditional soap and water because they:**

- Result in a significantly greater reduction in bacterial numbers than soap and water in many clinical situations (8)
- Require less time to use
- Cause less irritation to the skin
- Can be made readily accessible to HCWs
- Are more cost effective (9-10).

Both soap and ABHR products are necessary for the introduction of a hand hygiene program; a soap and water wash is required if hands are visibly soiled, and either product can be used if hands are visibly clean. As wet hands can more readily acquire and spread micro-organisms, the proper drying of hands is an integral part of routine hand hygiene (1).

Paper towels, cloth towels, and air dryers are commonly used to dry washed hands. There is currently conflicting evidence as to the efficacy of each method for removing bacteria from washed hands (11-13). Ideally, hands should be dried using either individual paper towels or hand driers which can dry hands effectively and as quickly as it can be done with paper towels (14), and have been proven not to be associated with the aerosolisation of pathogens (1).

HCWs must perform HH before and after every patient contact to prevent patients becoming colonised with healthcare acquired pathogens from other patients and the hospital environment. Emphasis must also be placed on preventing the transfer of organisms from a contaminated body site to a clean body site during patient care. The latest guidelines also recommend HH after contact with inanimate objects, including medical charts and equipment in the immediate vicinity of the patient (2).

Minimisation of irritant contact dermatitis related to appropriate HH is essential for improved HH compliance. The provision of a moisturising skin-care product, staff education and a tolerant, supportive attitude to any reported problems are a key part of successful introduction of a new ABHR.

Australian, Asian, and European studies (1, 4, 15-18) have demonstrated the clinical efficacy of a HH Culture-Change Program that includes the introduction of ABHR, with a marked and sustainable increase in HHC and a significant reduction in HCAI.



## 1.5 The Hand Hygiene Australia Culture-Change Program

The Australian Commission on Safety and Quality in Health Care (ACSQHC) has instigated the National Hand Hygiene Initiative (NHHI) and assigned its delivery to Hand Hygiene Australia (HHA). The primary aim of the NHHI is to improve HH compliance among HCWs, and to reduce the transmission of infection in health services throughout Australia. This involves a multi-interventional culture-change program to improve HH compliance via the increased use of ABHR.

**Key features of the HHA Culture-Change Program include the following:**

### 1.5.1 National Hand Hygiene Initiative

The NHHI aims to improve knowledge about infection control among HCWs, especially regarding the importance of appropriate HH in reducing the risk of healthcare associated infections (15-16, 19-20). The NHHI is multi-faceted and includes education regarding HH and ABHR, monitoring HH compliance and measuring infection rates. Crucial to this education process is timely feedback of these results to HCWs. The recruitment of ward champions to facilitate the process and encourage local ownership of the program is an advantage. Whilst the educational message is applicable to all healthcare settings, monitoring compliance and infection rates is not.

### 1.5.2 Use of Alcohol Based Hand Rub (ABHR)

ABHR should be placed at point-of-care (e.g. foot of the bed). Clear signage regarding appropriate use should be present. Ensuring ABHR is readily available at the point-of-care, including patient beds, on trolleys and in clinical areas, can reduce many of the potential barriers to good HH. Education should be provided clearly stating the advantages of ABHR – namely that it takes approximately 15-20 seconds to decontaminate hands, is less irritating and drying than soap and water, and does not require the use of paper towels. (See [Chapter 4](#) regarding specific ABHR product selection).

### 1.5.3 Monitoring Outcome Measures

**Monitoring the effects of the interventions involves assessing:**

- The rates of HH compliance as recorded by validated observers
- The rates of *Staphylococcus aureus* Bacteraemia (SAB).



#### 1.5.4 Ensuring Appropriate Infection Prevention Education

To assist with improving HCWs' general knowledge about infection prevention and HH, a computer-based online learning program is available to Australian institutions via the HHA website ([www.hha.org.au](http://www.hha.org.au)). Executive endorsement of the online learning program as a compulsory requirement for all staff and students has proven successful in many institutions in improving HH compliance. The program assists with education even in situations where there are high rates of staff turnover.



## Chapter 2

# Hand Hygiene Culture Change Program Management and Outcomes

### 2.1 Aim

To form a multidisciplinary team to lead the implementation of the Hand Hygiene Program.



## 2.2 Program Implementation Model

The program aims to decrease healthcare associated infections by introducing the NHHI and increasing the use of ABHR. The program involves:

- Choosing a Program Officer and Medical Champion who, along with the Infection Control team, will be the core team responsible for the project
  - The coordinator should have an understanding of hand hygiene and infection control issues and ideally a broader experience on quality and safety; he/she should be able to access high level management staff within the facility (21)
- Introducing an ABHR and new improved HH practices to selected pilot wards.
- Evaluation of pilot ward data
- Hospital-wide introduction of an ABHR and new improved HH practices
- Achieving a hospital-wide improvement in HH
- Monitoring the two key outcome measures of HH compliance and rates of SAB. This should include a baseline assessment of HH compliance and collection of the previous 24 months data on SAB.

A checklist to introducing a HH culture-change program can be found in [Appendix 1](#), and a toolkit of available resources in [Appendix 2](#).



## 2.3 Initial tasks of the HH Project Team

### 2.3.1 Forming a Steering Committee

Identifying key members of a health service is a critical element for engaging clinical and non-clinical staff in the project, and for supporting the core HH Program Team. It is important that an Executive sponsor is identified and that they are a part of the Steering Committee. The following list identifies some potential members for this committee:

Project Officer/Program Coordinator	Microbiology laboratory representative	Clinical education representative
Executive member/sponsor	Medical and/or surgical representative	Patient representative/consumer
Medical Champion	Quality Improvement representative	Supply/Stores Department
Infection Control Consultant(s)	Human resources	Allied Health
Pharmacist	OH&S representative	Environmental Services representative
Infectious Diseases Physician(s)	HH program representative from each pilot ward (ward champion)	Public relations/corporate development representative

### 2.3.2 Allocate Roles and Responsibilities for the Steering Committee

#### Areas for consideration:

- Line of reporting for committee members
- Education
- Marketing
- Data collection
- ABHR selection
- Product placement
  - A well organised and executed plan for installation of HH products is an essential step in any program to enhance HH adherence in health care settings (22)
- Implementation of policies and procedures
  - HH Policy ([Appendix 17](#))
  - Participation in HH Education ([Appendix 18](#))
  - OH&S safety management of ABHR ([Appendix 21](#)).

### 2.3.3 Selection of Wards

HHA recommend the initial selection of one ward to start the pilot implementation of the program. It is important to choose a ward where motivation and interest are high, and the health gain is likely to be substantial, thus impacting on the roll out to subsequent wards.

By piloting the program on one ward, any initial problems with product placement/supply, staff motivation/education can be addressed prior to rolling out the program to the other HHA reportable wards, and eventually the rest of the hospital.

Several factors need to be considered when determining which wards should be audited. As hand hygiene is the single most important element of strategies to prevent healthcare associated infection, wards known to have greater potential for high infection rates should be targeted. Improvements in hand hygiene compliance rates in these wards will have the greatest impact on the prevention of infection and provide a safer environment for patients. Generally, these wards also have the greatest staff/patient activity and interaction, which results in higher numbers of 'Moments' being audited in shorter time periods.

Auditing wards where there is little staff/patient activity and interaction will result in a small number of moments being observed (i.e. non-acute settings) and resources required to undertake auditing may be better utilised measuring other aspects of a hand hygiene program (e.g. product placement, education etc).

The selection of wards should be made in conjunction with the appropriate committee at the hospital (e.g. Infection Control Committee, Hand Hygiene Committee, Quality Improvement Committee) and with Executive approval.

### 2.3.3.1 Options for selecting wards

#### OPTION A. High Risk Wards with rotation of other Wards

**HHA recommend** that wards be categorised into those with patients at a higher risk of healthcare associated infection “High Risk Wards”, and other wards being “Standard Risk Wards”. It is the responsibility of each facility to identify its own High Risk wards.

#### As a guide HHA suggest:

1. High Risk wards include: Intensive Care, haematology/oncology, transplant, renal, dialysis, and wards with immunocompromised patients. High Risk may also include wards with known or suspected high rates of healthcare associated infection, high prevalence of patients with multi-resistant organisms, crowded accommodation etc.
2. Standard Risk Wards include all other wards not in the High Risk group.

Each facility should have a Hand Hygiene Compliance audit cycle plan endorsed by the appropriate committee at the hospital (e.g. Infection Control Committee, Hand Hygiene Committee, Quality Improvement Committee) and with Executive approval.

The Hand Hygiene Compliance audit cycle plan should clearly identify High Risk wards and Standard Risk wards.

#### HHA recommends:

- All wards in the High Risk group must ALWAYS be audited every audit period.
- Standard Risk Wards to be rotated every audit. If a Standard Risk ward demonstrates low compliance rates, the hospital should follow up separately to the auditing undertaken as part of their Hand Hygiene Compliance audit cycle plan. The follow up may include education and further auditing.
- All wards audited should be audited for a minimum number of Moments as per [Table 2.4.1](#).  
E.g. >400 bed hospital audits 7 wards for a min of 350 Moments on each.

#### OPTION B. High Risk Wards with auditing of all other wards

#### HHA recommends:

- All wards in the High Risk group must ALWAYS be audited every audit period for a minimum of number of Moments as per [Table 2.4.1](#).
- All Standard Risk Wards are also audited every audit period. The number of moments to be audited is a hospital decision, keeping in mind issues regarding reliability of compliance rates as mentioned below
- The minimum hospital total number of Moments audited is dependent on hospital size and is listed in [Table 2.4.1](#).  
E.g. >400 bed hospital. ICU and HONC wards audited for 350 moments each. The remaining 1750 Moments can be audited in any, or all, other wards.



### **OPTION C. Intensive Care Unit with auditing of all other wards**

#### **HHA recommends:**

- The Intensive Care Unit must ALWAYS be audited every audit period for a minimum of 350 moments
- All other Wards are also audited every audit period. The number of moments to be audited is a hospital decision, keeping in mind issues regarding reliability of compliance rates as mentioned below.
- The minimum hospital total number of Moments audited is dependent on hospital size listed and is listed in [Table 2.4.1](#).  
E.g. ICU audited for 350 moments. The remaining 2100 Moments can be audited in any, or all, other wards.

Once the roll out has been completed on the required number of wards for reporting to HHA (see [Table 2.4.1](#)), it is important to spread the program to the rest of the hospital wards, out-patient areas, clinics and non-patient areas.

## **2.4 Hand Hygiene Program Targets and Outcome Measures**

### **2.4.1 Outcome Measure 1: Hand Hygiene Compliance**

HH compliance should be measured at specified intervals during the program, with the number of acute in-patient beds at each facility dictating the number of areas required to be audited, and the number of observations to be undertaken once the pilot period has been completed (see [Table 2.4.1](#)). The standardised HH compliance assessment form should be used for all assessments (see [Appendices 9, 10, 11](#)).



**Table 2.4.1 Number of Moments per hospital size**

Number of acute inpatient beds at the hospital	Required number of HH audits per year	Required number of wards per HH audit *	Required number of HH Moments per ward	Total minimum HH Moments for hospital per audit
>400	3	7	350	2450
301-400	3	6	350	2100
201-300	3	5	350	1750
101-200	3	4	200	800
51-100	3	2	100	200
25-50	3	1	100	100
< 25	3	1	50	50

\* for Option A only

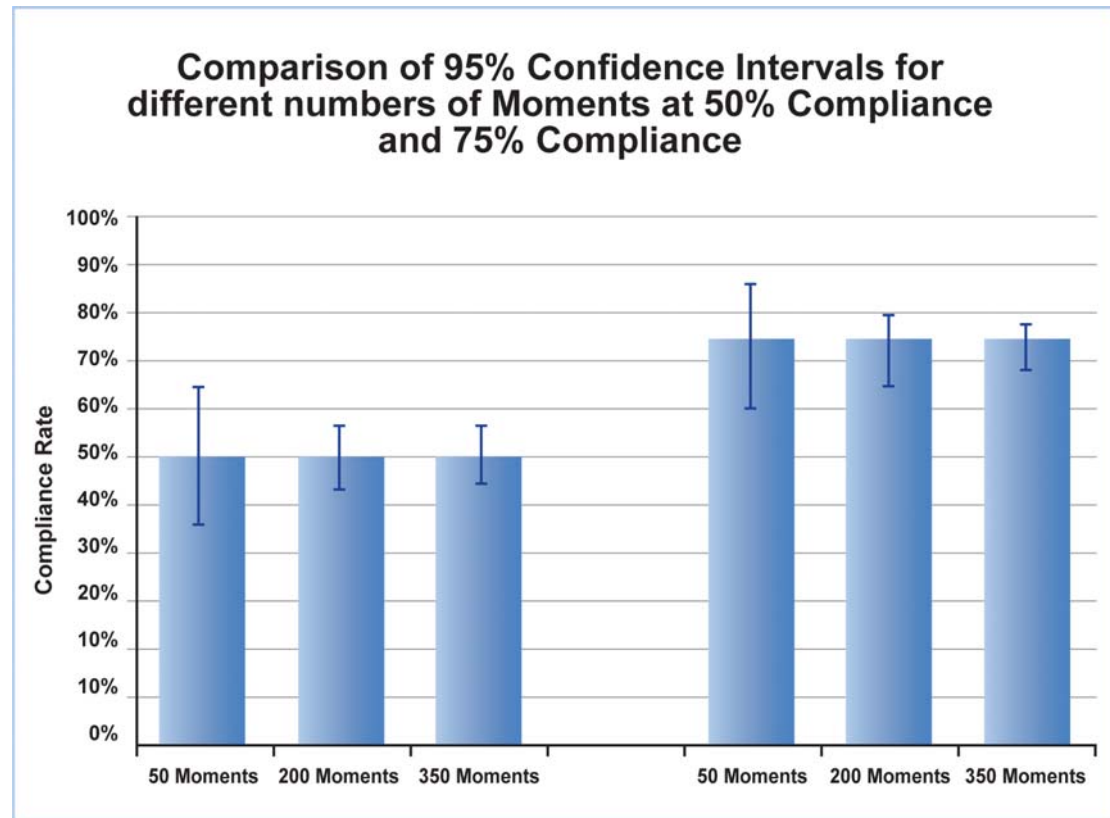
Inevitably compliance data will be used for comparison, be it at a ward, hospital, jurisdictional or national level. When data is used for comparison, it is important to note that generally a higher number of Moments audited will generate a more reliable the compliance rate.

For example, if a ward is audited for 50 Moments generating a compliance rate of 50%, the exact binomial 95% Confidence Interval (95%CI) will be 36% to 64%. This means the real compliance rate could be anywhere between 36% and 64%. If another ward audits 350 Moments and generates a compliance rate of 50%, the 95%CI is 45% to 55%. So we are more confident the real rate is close to 50%.

HHA recommend 95% confidence intervals be included when reporting compliance rates. See [Chart 2.4.1](#) below for a further demonstration on the effect on confidence intervals when the numbers of moments are increased.



**Chart 2.4.1 Confidence Intervals and Moments Audited**



Training in the HH compliance assessment tool, data collection, data entry and data analysis will be provided for all participating hospitals by HHA.

Rates of HH compliance will be assessed and reported according to a number of specified criteria, including by HCW category, and type of activity performed. Timely feedback and education should be provided to all HCWs observed (e.g. nurses, medical staff, allied health and other, See [Chapter 7](#) for details)

### **2.4.2 Outcome measure 2: Rates of *Staphylococcus aureus* bacteraemia**

In conjunction with the Australian Commission on Safety and Quality in Healthcare, *Staphylococcus aureus* bacteraemia rates will be provided by jurisdictions consistent with agreed national definitions. These will be used to measure the effect of the NHHI.



## 2.5 Timetable for data submission

HH compliance assessments should be undertaken three times a year, with data submitted according to the recommended schedule on the home page of the HHA website [www.hha.org.au](http://www.hha.org.au)

Data is submitted to the State /Territory Coordinator, who then forwards the deidentified data to HHA.



## Chapter 3

# Achieving Effective Culture-Change

### 3.1 Leadership and Ownership

Sustaining improved HH involves a culture-change program. The following chapter highlights the key components of this program.



### 3.1.1 Executive commitment

The Hospital Executive should demonstrate commitment and support of the Hand Hygiene Program (15) through interest, participation and regular reporting on the Program at Executive meetings, and to the Hospital Board.

For the successful implementation and sustainability of the HH Program, resources will be required to initiate the program within each hospital. Some of the requirements may include: appointment of a program co-ordinator, initial purchasing of ABHR for the entire hospital, then ongoing ABHR costs, and educational materials

### 3.1.2 Clinical leadership team

Staff from the Departments of Infection Control, Infectious Diseases, Microbiology and Pharmacy (where available) should have an active role in the program implementation throughout the organisation, and should be the key drivers of the Steering Committee.

### 3.1.3 Staff ownership

**Staff ownership of the program should be encouraged and supported through:**

- Regular and timely feedback to ward staff of compliance rates
- Recognition of each ward/department's achievements
- Enthusiastic ward/department staff should be appointed as HH "liaison officers" or "ward champions" to take responsibility for HH promotion in the ward/department, including encouraging the online HH learning package
- Ensuring each ward/department nominates a staff member to be accountable for a HH portfolio (see [Section 3.1.4](#))
- The use of education tools and constant reminders
- Provision of audit tools to ward staff to assess product availability ([Appendix 20](#))
- Staff completion of the HHA online learning package. HHA recommend all employees complete the package on employment and on an annual basis
- Ward-based promotional activities (see [Section 3.3](#))
- Promotional material such as ABHR T-shirts, hats etc. These can be worn by the HH program team during educational sessions, presentations and launches. Merchandise may also be supplied to staff as prizes. Posters are available to download off the HHA website. HHA do not have the resources to provide promotional material to individual facilities throughout Australia.



### 3.1.4 Hand Hygiene Program Liaison Officers

The appointment of ward/department-based HH liaison officers or champions are helpful in linking the ward and the HH program and assist with the NHHI.

**This role involves:**

- Acting as role models for all staff
- Motivating staff
- Facilitating involvement and ownership of the project by HCWs in each ward
- Presenting outcome data to staff
- Monitoring product placement and availability by conducting audits
- Assisting with promotional activities in their ward
- Assisting HCWs in their ward to complete the online learning package
- Educating new staff in HH
- Ward / area orientation to all new staff regarding HH product, product placement and product storage.



## 3.2 Development of policies and protocols

To embed the changes in HH practices into the culture of each healthcare institution a number of policies need to be developed:

- Hand Hygiene Policy recommending the use of ABHR by all HCWs (see [Appendix 16](#))
- Education of HCWs with formal assessment of knowledge about HH. Support for this by hospital Executive can greatly assist with its implementation (see [Appendix 17](#))
- Clear guidelines about wearing jewellery and acrylic/false nails in clinical areas due to increased risk of colonisation (23) (see [Appendix 17](#))
- Guidelines for appropriately managing HCWs who have contact dermatitis potentially associated with HH product use (see [Appendix 19](#))
- Cleaning shared equipment recommendations (see [Section 9.2](#))
- Clear guidelines on placement of ABHR in healthcare facilities (see [Appendix 8](#))
- Occupational Health and Safety policy on storage of ABHR (as per ABHR MSDS from company supplying product)
- Occupational Health and Safety Risk Assessment for Product Placement (see [Appendix 21](#))
- Education and evaluation of HH auditors on knowledge of HH compliance assessment (see [Chapter 7](#))
- Identify key staff figures to ensure ABHR bottles are replaced when empty, and brackets are installed appropriately and replaced when broken or missing.

Alcohol based hand rub products at the point of care will improve hand hygiene compliance, but multidisciplinary strategies are required to establish hand hygiene recommendations in the long term (24).



## 3.3 Promotion of Hand Hygiene

Promotion of HH in each hospital can be undertaken in many ways. The following include a few popular suggestions:

### 3.3.1 *Talking Walls* campaign

A popular method to assist with staff ownership is the Geneva *Talking Walls* model (15). The principle of *Talking Walls* is to use art and humour to reinforce the principles of infection prevention through improved HH among staff. Staff from each ward can be invited to help design a poster featuring their own HH message. The resulting posters can then be placed throughout the hospital acknowledging the ward's creativity (ensure own hospital policy on poster placement is known prior).

#### **Benefits of this approach include:**

- Promotion of “program ownership” to reinforce the NHHI by directly involving local HCWs
- Reinforcement of the rational “left brain” messages with pictorial ‘right brain’ emotional messages (for further details see [www.hopisafe.ch](http://www.hopisafe.ch) ).

### 3.3.2 Other promotional activities

Often the manufacturers of your hand hygiene products are able to assist with the planning, promotion and funding of these activities:

- Give aways
- BBQ lunch/ward lunch/afternoon tea
- Spot prizes
- Stickers/badges/pens/sticky note pads (with HH slogan on them)
- “Slogan” competitions
- Quizzes, crosswords, word search
- Pay slip notices
- Internal magazines/newsletters
- Screen savers.

## 3.4 Sustainability

**Key features of long-term sustainability include the following:**

### 3.4.1 Hospital-wide rollout

For this program to be successful the enthusiastic and continued support of your hospital Executive is essential. HCW acceptance and ownership of the NHHI program assists sustainability.

### 3.4.2 Hand Hygiene Education and Assessment

HH education and assessment can play a key role in sustaining good HH practice and maintaining the NHHI. An online HH learning package has been shown to be effective in supporting this process (25).

The HHA online learning package ([www.hha.org.au/LearningPackage.aspx](http://www.hha.org.au/LearningPackage.aspx)) includes a series of educational slides and questions, and provides immediate feedback after each section is answered - users can only move to the next section after they have selected the correct answers. A user is considered “educated in basic HH theory” if they achieve a score of 100%. The implementation of education and assessment will vary from hospital to hospital and each will need to work with their respective IT departments, HR departments or others as needed.

All Australian healthcare facilities can become registered users of the HHA online learning package by contacting the HHA office. This provides the ability to report on numbers of staff who have completed the education package. Alternatively, healthcare institutions can develop their own package, or continue with an existing program.

The HH education and assessment package should be readily available to all staff by means of the internet. Alternatively, the education and assessment could be undertaken during the hospital orientation program for new staff:

- Ideally new employees should complete the education and assessment package before they can obtain their photo ID badge, at hospital induction programs, or as soon as possible after employment. This condition can be written into employment contracts and also made a requirement for all student HCWs in a number of institutions. Certificates can be generated on successful completion of the assessment process
- The online learning package could become a mandatory component of the annual performance appraisal of all HCWs
- Awareness of the online learning package can be promoted via:
  - Hospital Intranet
  - Pay slip messages
  - Recruitment of HH Program representatives
  - Poster displays
  - Electronic reminders, including lists of HCWs sent to key managers
  - Pre-employment paperwork.



### 3.4.3 Barriers to achieving change

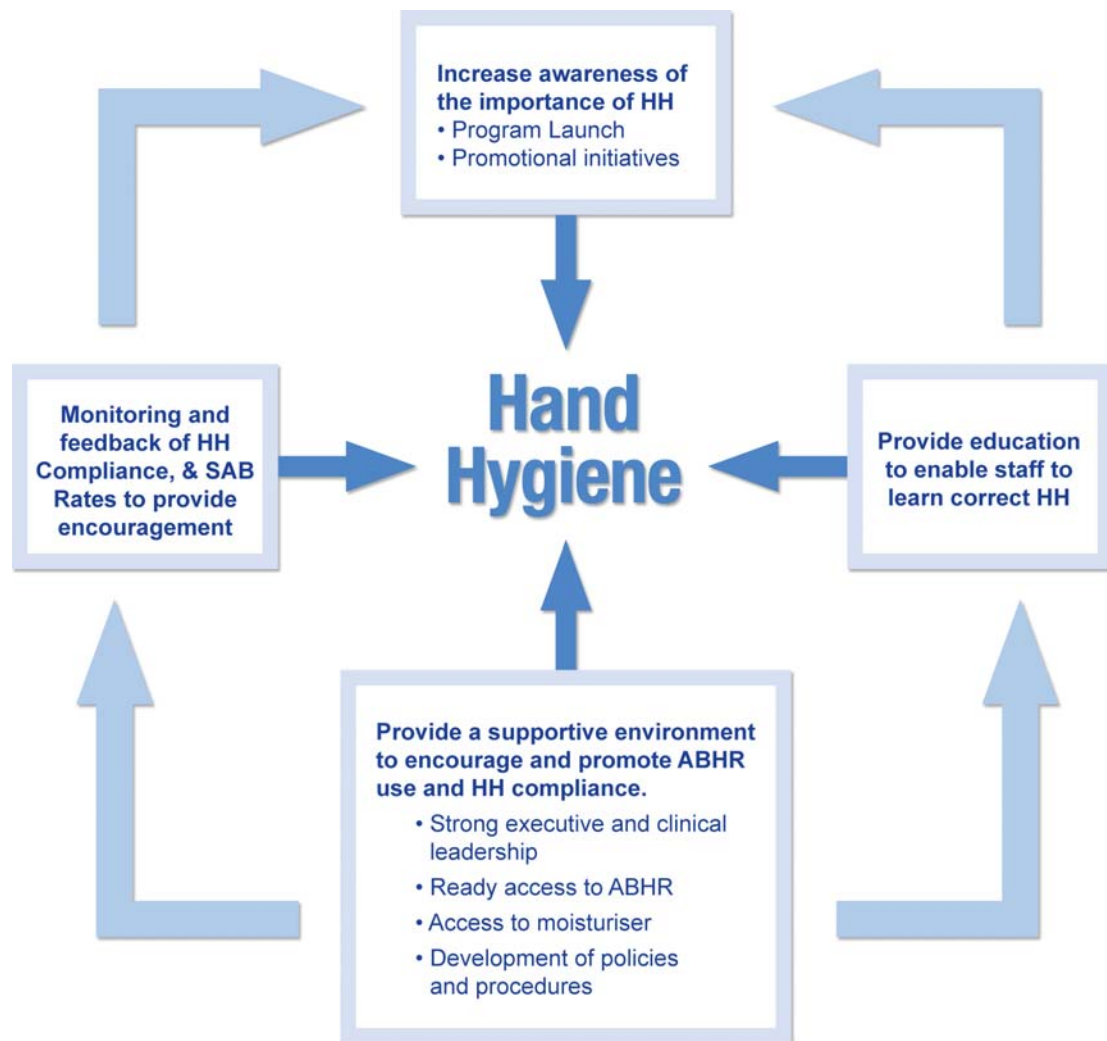
Change is a fundamental component of continuous quality improvement. Any improvement methodology involves introducing change and measuring its impact. In health care there has been recognition of the need for system change to support the delivery of safe, quality care. Every system is perfectly designed to achieve exactly the results it gets. This focus on system change has been associated with the development of a number of tools and improvement strategies. Health services are also implementing system change in response to risk areas identified through review of adverse events.

It may help those involved in managing the HH Program to be aware of the barriers that normally confront any change process. Knowledge or awareness of change processes may assist in ensuring the success of a project.

The following figure provides an example of how the principles of culture change may be communicated to show the ways in which the various aspects of the project, promotion, advocacy, policies and standards, environmental support, education and assessment, interact to achieve cultural change (26).



**Figure 3.4.3 HH Culture-Change (26)**



### 3.4.4 Using the Hand Hygiene Evaluations for Culture Change

In a facility where the Hand Hygiene program is being implemented for the first time, data indicating gaps in good practices and knowledge, or a poor perception of the problem, can be used to raise awareness and convince HCWs that there is a need for improvement (21).

This feedback helps to promote local area ownership of HH issues, and should encourage changes to practice where indicated from the feedback. Discussing Hand Hygiene Compliance (HHC) data at the local level should promote the development of local initiatives to address the specific issues.

Subsequently, after implementation, regular and timely reporting of data is crucial to demonstrate improvement; thereby sustaining the motivation to perform good practices and making continuous individual and institutional efforts (21).

## Chapter 4

# Product Selection and Placement

### 4.1 Aim

To successfully implement and sustain a HH Culture-change program a major factor is to ensure the choice of HH solution is acceptable to the users, and that all logistical issues in product installation have been addressed.

A well-planned and well-executed installation of HH products is an essential step in any program to enhance hand hygiene adherence (22).

Before deciding on the selection and placement of ABHR for your facility, it may be useful to provide HCWs with the opportunity to evaluate these products. To gain better compliance the selection strategy requires input from a multi-disciplinary team (1).



## 4.2 Product selection

When selecting an ABHR product, HHA recommends:

1. The Product meets the EN1500 testing standard for bactericidal effect (see [Section 4.2.1.1.1](#))
2. The Product has Therapeutic Goods Administration (TGA) approval as a hand hygiene product

However, product selection is ***ultimately the choice of each health care facility***, and other factors should also be considered, such as:

- Dermal tolerance
- Aesthetic preferences such as fragrance, colour, texture and ease of use
- Practical considerations such as availability, convenience, functioning of dispenser, and ability to prevent contamination
- Cost issues.

Please note that the above information on product selection is a **recommendation** only. HHA do not promote specific products, nor do they mandate product selection. Product selection is ultimately the choice of each health care facility.

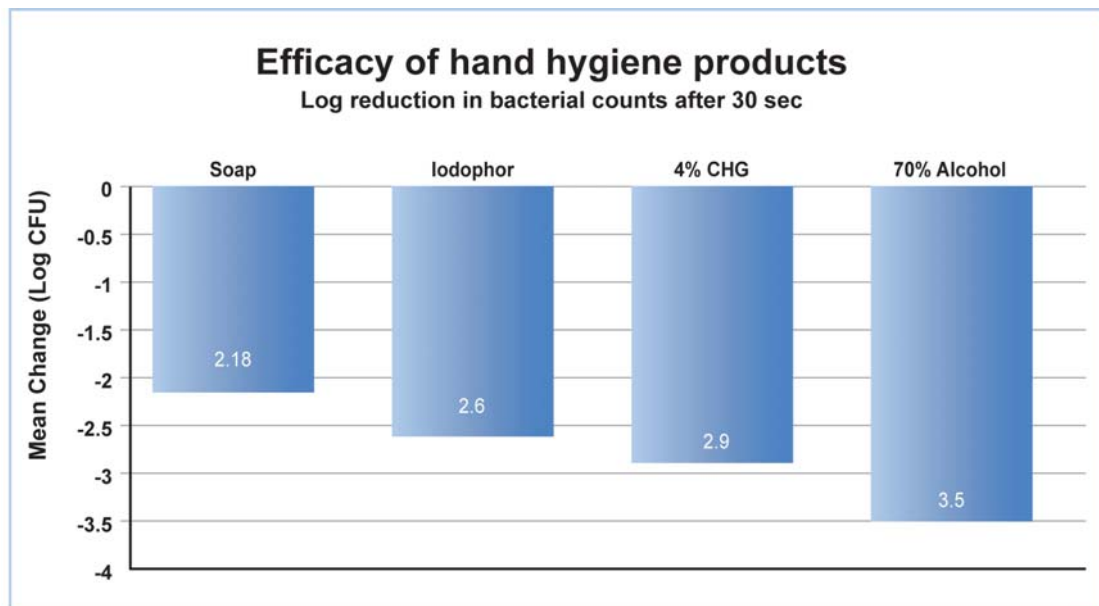
The following information is the current evidence available to assist healthcare facilities in choosing an appropriate ABHR.

### 4.2.1 Product features

ABHRs are more effective against most bacteria and many viruses than either medicated or non-medicated soaps (see [Figure 4.2.1](#) overleaf).



**Figure 4.2.1 Effectiveness of different HH products**



Original data from: Ayliffe GAJ et al. J Hosp Infection. 1988;11:226

With the exception of non-medicated soaps, every new formulation for hand hygiene should be tested for its antimicrobial efficacy to demonstrate that:

- It has superior efficacy over normal soap; or
- It meets an agreed performance standard.

#### 4.2.1.1 ABHR Performance Testing (in vivo laboratory based tests)

##### 4.2.1.1.1 EN 1500 (European Committee for Standardisation)

Testing requires 18 – 22 subjects, and a culture of *E. coli*. Subjects are randomly assigned to two groups where one uses the test handrub, and the other a standard reference solution (60% v/v isopropanol). The groups then reverse roles (cross over design). The mean acceptable reduction with a test formulation shall not be significantly inferior to that with the reference handrub (1).

##### 4.2.1.1.2 ASTM E-1174 (ASTM International – used by USA and Canada)

Testing requires two groups of 54 subjects. The indicator organism (*S. marcescens* or *E. coli*) is applied and rubbed over hands. The test handrub is then applied. The efficacy criteria are a 2-log<sub>10</sub> reduction of the indicator organism on each hand within 5 minutes after the first use, and a 3-log<sub>10</sub> reduction of the indicator organism on each hand within 5 minutes after the tenth use (1).

#### 4.2.1.1.3 Comparison of ABHR test procedures

The performance criteria in the above tests are not the same, therefore a product could meet one criterion but not the other. The level of reduction in microbial counts needed to produce a meaningful drop in the hand-borne spread of health care associated infections remains unknown (1).

HHA recommends products tested using the EN 1500 criteria as this test more closely reflects the use of an ABHR in a typical clinical situation. The efficacy criteria for the ASTM E-1174 are extremely low, with unmedicated soap and water being able to achieve a 3-log<sub>10</sub> reduction of the indicator organism within 1 minute. Furthermore, 5 minutes is too long to wait between patients after using an ABHR (1).

**The activity of ABHRs against bacteria, fungi and viruses is affected by a number of factors including:**

#### 4.2.1.2 Type of alcohol

Isopropanol and ethanol both have in-vitro activity against bacteria, fungi and viruses. When tested at the same concentration, isopropanol is more efficacious than ethanol (1); however ethanol has greater activity against viruses than isopropanol (1, 27).

#### 4.2.1.3 Alcohol-only ABHR versus Alcohol-chlorhexidine ABHR

Although alcohols are rapidly germicidal when applied to the skin, they have no appreciable persistent or residual activity. The addition of a low concentration of chlorhexidine to an ABHR results in significantly greater residual activity than alcohol alone (1, 28) and therefore potentially improves efficacy. Notably, most published clinical studies that have demonstrated reductions in healthcare associated infections (HCAs) with the use of ABHR, have been associated with the use of ABHR that contains at least 70% alcohol (isopropanol), 0.5% chlorhexidine and a skin emollient (15-16).

To date there has been one published clinical study showing that alcohol-only ABHR is effective in reducing HCAs (indeed, it is one of the formulations recommended by WHO), however this study was conducted in a developing healthcare setting using a product that has higher concentrations of alcohol than what is currently available on the Australian market (29). Further clinical studies in this area are encouraged.



#### 4.2.1.4 Alcohol concentration

There is a clear positive association between the extent of bacterial reduction and the concentration of alcohol contained in ABHR products. Furthermore the concentration for maximum efficacy is different for isopropanol than ethanol. E.g. ABHR containing 60% isopropanol is associated with similar cutaneous bactericidal activity as ABHR that contains 77% ethanol (28).

When comparing alcohol concentrations it is important to look at the unit of measure, not just the numerical value of the concentration. Alcohol concentrations can be reported in a number of ways:

- Volume / Volume (V/V)
- Weight / Weight (w/w)
- Weight / Volume (w/V)

Conversion tables are available for comparison between V/V and w/w for ethanol only (30). A sample of ethanol labelled with a concentration of 70% V/V is equivalent to an ethanol sample labelled as 62.39% w/w (30).

Significant differences in the efficacy of ABHRs appear to be due to a product's overall concentration of alcohol (31) with higher concentrations being more efficacious.

#### 4.2.1.5 Alcohol absorption

The selection of an ABHR may be influenced by religious factors. According to some religions alcohol consumption is prohibited. ABHR with isopropanol appears more predictable in its lack of cutaneous alcohol absorption when compared with an ethanol-based ABHR, and may therefore be more acceptable to some religious groups (32). An awareness of commonly held religious and cultural beliefs is vital when introducing new concepts to today's multicultural health care community (33) (See [Section 4.11](#) for more detailed information).



#### 4.2.1.6 Solutions versus gels versus foams

Laboratory studies have found that ABHR solutions are more effective than ABHR gels that contain an equivalent concentration of alcohol (34). Historically gels contain approximately 10% less effective alcohol than a similar solution. For example, an ABHR gel containing 60% alcohol has similar effective alcohol activity as a 50% ABHR solution (4). Technically it has proven difficult to develop ABHR gels that contain  $\geq 70\%$  alcohol without the gel becoming less viscous and more solution-like. Thus the first generations of gel formulations have reduced antimicrobial efficacy compared with solutions (1).

There is some evidence to suggest gels are preferred to solutions, and have a trend towards improved compliance (1). Recent evidence suggests that the efficacy of alcohol based gels may depend mainly on concentration and type of alcohol in the formulation, rather than on product consistency (35).

Foams are new to the ABHR market and to date are used less frequently. There is currently minimal clinical evidence available for the use of alcohol based foams. Further clinical tests are encouraged.

HHA recommendations for product selection are outlined in [Section 4.2](#), it does not matter if the product chosen is a solution, gel or foam.

#### 4.2.1.7 ABHR volume and drying time

The volume of hand rub dispensed is important. One mL of alcohol has been shown to be substantially less effective than 3 mL (8). The effective volume of ABHR (2-3 mL; 1-2 squirts from most ABHR dispensers) generally takes 15-20 seconds to dry on hands – hence ABHR drying time is a convenient indicator that sufficient ABHR has been applied. It is important to follow the recommendations of the manufacturer which are usually found on the ABHR bottle.

In clinical practice often smaller volumes are used than what is recommended in the testing of ABHRs. Unless high concentration products are used there is no significant reduction in contaminants with small volumes of ABHR (31).

It is essential that the team in charge of implementing the ABHR educate their staff about the correct use of the product. Specific education is required to ensure the correct dose is administered: it is important to use a two handed action to operate the dispenser, and to recognise that the number of squirts required for the ABHR to be effective may differ between products, or the size of the HCW's hands. ABHR should never be applied to gloves.

#### 4.2.1.8 If hands are wet when ABHR is applied

The antimicrobial efficacy of alcohols is very sensitive to dilution with water and is therefore vulnerable to inactivation, especially if only small volumes of ABHR are applied. For instance, if 60% isopropanol were rubbed onto wet hands in two portions of 3 mL (each for 1 minute), the mean log bacterial reduction achieved is 3.7, as compared to 4.3 with dry hands (28). Thus, it is recommended that ABHR be applied to dry hands.



#### 4.2.1.9 ABHR activity versus other HH antiseptic agents (4):

Group	Gram-positive bacteria	Gram-negative bacteria	Mycobacteria	Fungi	Viruses	Speed of action	Comments
Alcohols	+++	+++	+++	+++	+++	Fast	Optimum concentration 60-90%; non-persistent activity
Chlorhexidine (2% and 4% aqueous)	+++	++	+	+	+++	Intermediate	Persistent activity; rare allergic reactions
Iodine Compounds	+++	+++	+++	++	+++	Intermediate	Causes skin burns; usually too irritating for hand hygiene
Iodophors	+++	+++	+	++	++	Intermediate	Less irritating than iodine; acceptance varies
Phenol Derivatives	+++	+	+	+	+	Intermediate	Activity neutralised by non-ionic surfactants
Triclosan	+++	++	+	-	+++	Intermediate	Acceptability on hands varies
Quarternary ammonium compounds	+	++	-	-	+	Slow	Used only in combination with alcohols; ecologic concerns

#### 4.2.1.10 Alcohol wipes for Hand Hygiene

Alcohol impregnated wipes contain only a small amount of alcohol and are not much more effective than washing hands with soap and water (1). The use of alcohol wipes should be contained to cleaning visibly clean shared patient equipment and not for hand hygiene.



### 4.3 Staff preference

The level of HCW acceptance of ABHRs is a crucial factor in the success of any HH Program. The following ABHR features can influence ABHR acceptability (1):

- Fragrance and colour - these may increase the initial appeal but may cause allergenic reactions, and are therefore discouraged
- The emollient agent(s) in the ABHR should prevent skin drying and irritant skin reactions, but not leave a sticky residue on hands
- Drying characteristics. In general, ABHR solutions have lower viscosity than gels and therefore tend to dry quicker
- Risk of skin irritation and dryness. Proactive and sympathetic management of this problem is vital (see [Section 4.8](#))
- Product availability. Product should be readily available at the point of care (e.g. bedside) and in all patient-care areas
- There is some evidence to suggest that gels are preferred to solutions (36), however it is important for staff to evaluate products themselves prior to implementation where possible.



## 4.4 Product placement and supply

Critical to the success of the program is having ABHR readily available to HCWs in their work area and near the patient (1). Dispensers act as a visual cue for hand hygiene behaviour, and their strategic and ubiquitous placement makes the product highly accessible for frequent use (26). Placement of ABHR needs to be consistent and reliable (See [Appendix 8](#)). Clinical staff should assist with the decision-making process, as they generally best understand the workflow in their area. Although this may be time consuming the benefit of behavioural adherence will be marked.

Where possible ABHR should be placed at the foot of every bed, or within each patient cubicle. An article by Traore (2007) concluded that “availability of a handrub at the point of care increased hand hygiene compliance independently of the type of product used, time of day, professional category and other confounders” (36).

There is no advantage in placing dispensers next to sinks as this can cause confusion for some HCWs who may think they need to rinse their hands with water after using ABHR.

Special consideration is necessary when locating ABHR in clinical areas where ingestion or accidental splashing of ABHR is a particular risk (accidental ingestion of ABHR has been reported, but is uncommon (37)).

### Such areas include:

- Paediatrics – ABHR should be located with care near children (See [Section 4.16](#))
- Mental Health – ABHR should be located with care near mentally ill patients, patients undergoing alcohol- or drug-withdrawal, or where there are cognitively impaired patients
- Public areas - ABHR needs placement in high traffic areas with clear signage regarding appropriate use and the need for parents to carefully supervise their children
- Bracket design is important since ABHR placement may be affected if ABHR brackets are ill-fitting (e.g. varying sizes of bed rails can affect the efficacy of some ABHR brackets). Consider brackets that are removable, or product that can be removed from brackets easily in case short term patient demands warrant it. Also take into account bracket availability and installation costs, since these expenses can be substantial.

Small personal bottles that HCWs carry with them may be more appropriate in some of the above areas.



**The following ABHR placement locations are suggested:**

- On the end of every patient bed (fixed or removable brackets)
- Affixed to mobile work trolleys (e.g. intravenous, drug and dressing trolleys)
- High staff traffic areas (e.g. nurse's station, pan room, medication room and patient room entrance)
- Other multi-use patient-care areas, such as examination rooms and outpatient consultation rooms
- Entrances to each ward, outpatient clinic or Department
- Public areas – e.g. waiting rooms, receptions areas, hospital foyers, near elevator doors in high traffic areas (see [Appendix 11](#) for guidelines on product placement).

A clear decision needs to be made about whose responsibility it will be to replace empty ABHR bottles. Workplace agreements or job descriptions may need to be changed to accommodate prompt replacement of these bottles (16).

There are a number of risks to patients and staff associated with the use of ABHR; however the benefits in terms of its use far outweigh the risks. A risk assessment should be undertaken and a management plan put in place. This particularly applies to clinical areas managing patients with alcohol use disorders, and patients at risk of self harm (see [Appendix 21](#)).

## 4.5 Repeated ABHR Use

There is no maximum number of times that ABHR can be used before hands need to be washed with soap and water (38).

## 4.6 ABHR Limitations

### 4.6.1 Bacterial spores

Alcohol has virtually no activity against bacterial spores. Washing hands with soap and water is preferred in this situation because it is the best method of physically removing spores from the hands (1). However, the vegetative form of *Clostridium difficile* is highly sensitive to ABHR.

The 2010 ASID / AICA position statement on Infection Control Guidelines for Patients with *Clostridium difficile* Infection (CDI) in Healthcare Settings (39) recommends the primary use of ABHR in accordance with the WHO 5 Moments for Hand Hygiene when caring for patients with CDI. Gloves should be used during the care of patients with CDI, to minimise spore contamination, and if hands become soiled, or gloves have not been used, then hands must be washed with soap and water.



### 4.6.2 Non-enveloped (non-lipophilic) viruses

Alcohol has poor activity against some non-enveloped viruses. E.g. rotavirus, norovirus, polio, Hepatitis A. However, there is conflicting evidence suggesting that ABHR is more effective than soaps in reducing virus titres on finger pads (1, 40-41). Thus, in norovirus outbreaks it is usually best to reinforce the use of ABHR, unless hands are visibly soiled – then soap and water HH is preferred.

### 4.6.3 Other Organisms

Alcohol has a poor activity against tropical parasites, and protozoan oocysts. Hand washing is preferred.

## 4.7 HH Product Compatibility

It is important to ensure that the selected ABHR, soaps, and moisturising lotions are chemically compatible to minimise skin reactions among staff (22).

## 4.8 Hand Care Issues

Intact skin is a first line defence mechanism against infection. Damaged skin can not only lead to infection in the host, but can also harbour higher numbers of micro-organisms than intact skin and hence increase the risk of transmission to others. Damaged skin on HCWs is an important issue and needs to be seriously addressed.

There are two major types of skin reactions associated with hand hygiene. **Irritant contact dermatitis**; which includes symptoms that can vary from mild to debilitating, including dryness, irritation, itching, and even cracking and bleeding. **Allergic contact dermatitis**, which is rare and represents an allergy to some ingredient in a hand hygiene product. In its most serious form allergic contact dermatitis may be associated with symptoms of anaphylaxis (1).

The vast majority of skin problems among HCWs that are related to HH are due to “irritant contact dermatitis” (42). Irritant contact dermatitis is primarily due to frequent and repeated use of HH products - especially soaps, other detergents, and paper towel use, which result in skin drying. The initial use of ABHR among such HCWs often results in a stinging sensation. However, recent studies have suggested that the ongoing use of emollient-containing ABHR leads to improvement in irritant contact dermatitis in approximately 70% of affected HCWs (43).



**Factors that may contribute to dermatitis include:**

- Fragrances and preservatives. Commonly the cause of contact allergies; these should be kept to a minimum or eliminated when selecting an ABHR
- Washing hands regularly with soap and water immediately before or after using an ABHR is not only unnecessary, but may lead to dermatitis (44)
- Donning gloves while hands are still wet from either handwashing or applying ABHR increase the risk of skin irritation (1)
- Using hot water for handwashing
- Failure to use supplementary moisturisers
- Quality of paper towels.

The management of hand care problems associated with the use of HH products requires early recognition and a systematic approach to ensure success.

**Strategies for minimising occupational hand dermatitis include:**

- Use of a HH product that contains skin emollient to minimise the risk of skin irritation and drying
- Educating staff on the correct use of HH products
- Educating staff on caring for their hands, including the regular use of skin moisturisers both at work and at home - such moisturising skin-care products need to be compatible with ABHR
- Providing a supportive attitude towards staff with skin problems.

ABHR produces the lowest incidence of irritant contact dermatitis of all the HH products currently available (1, 44). True allergy to ABHR is rare and allergy to alcohol alone has not been reported (44).

Although some reports have suggested that irritant contact dermatitis can occur in up to 30% HCWs (45); the incidence of this problem among a recent study of Victorian HCWs was extremely low (0.47%), representing one cutaneous adverse event per 72 years of HCW exposure (43).

HCWs should be encouraged to notify the HH Program Officer if skin irritation occurs following the use of ABHR. All complaints should be taken seriously and a review process instigated. All hospitals should have access to referral for follow up that may include: an Occupational Dermatologist, local Doctor, or emergency department for HCWs with persistent skin problems (see [Appendix 19](#)). For the WHO consensus recommendations on skin care see below.



#### 4.8.1 WHO Consensus Recommendations on Skin Care (1)

- Include information regarding hand care practices designed to reduce the risk of irritant contact dermatitis and other skin damage in education programmes for HCWs (IB)
- Provide alternative hand hygiene products for HCWs with confirmed allergies or adverse reactions to standard products used in the health care setting (II)
- Provide HCWs with hand lotions or creams to minimise the occurrence of irritant contact dermatitis associated with hand antisepsis or handwashing (IA)
- When alcohol based handrub is available in the health care facility for hygienic hand antisepsis, the use of antimicrobial soap is not recommended (II)
- Soap and alcohol based handrub should not be used concomitantly (II).

#### 4.8.2 Levels of Evidence for Consensus Recommendations on Skin Care (2)

IA – Strongly recommended for implementation and strongly supported by well designed experimental, clinical or epidemiological studies

1B – Strongly recommended for implementation and supported by some experimental, clinical or epidemiological studies and a strong theoretical rationale

II – Suggested for implementation and supported by suggestive clinical or epidemiological studies or a rationale or a consensus by a panel of experts.



## 4.9 Glove Use

**Disposable gloves are recommended to be worn for two main reasons (1):**

- To reduce the risk of contamination of HCWs hands with blood and other body fluids
- To reduce the risk of spreading germs to the environment and transmission from the HCW to the patient and vice versa, as well as from one patient to another.

The efficacy of gloves in preventing contamination of HCWs hands and helping to reduce transmission of pathogens in healthcare has been confirmed in several clinical studies (1). However, HCWs should be informed that gloves do not provide complete protection against hand contamination. Pathogens may gain access to the HCWs hands via small defects in gloves or by contamination of the hands during glove removal. Bacterial flora colonising patients may be recovered from the hands of  $\leq 30\%$  of HCWs who wear gloves during patient contact (2).

The recommendation to wear gloves during an entire episode of care for a patient who requires contact precautions, without considering indications for their removal, such as for hand hygiene, could lead to the transmission of germs. Hayden and colleagues found that HCWs seldom enter patient rooms without touching the environment, and that 52% of HCWs whose hands were free of VRE upon entering rooms contaminated their hands or gloves with VRE after touching the environment without touching the patient (46).

**Hand hygiene is required with glove use:**

- Hand hygiene should be performed before donning gloves
- Hand hygiene should occur after removing gloves
- Gloves should be removed to perform hand hygiene during the care for a single patient as indicated by the 5 Moments for Hand Hygiene.

For further information on glove use refer to [Appendix 7](#).

## 4.10 Cutaneous Absorption

Recent studies have demonstrated minimal rates of cutaneous alcohol absorption such that there should be no concern for HCWs (32, 47). An Australian study suggested that isopropanol might be less likely to be absorbed than ethanol. Thus, HCWs concerned about absorption for religious reasons may elect to use an ABHR that contains isopropanol rather than ethanol (32).



## 4.11 Religion and Culture

Cultural and religious factors strongly influence attitudes to community handwashing which, according to behavioural theorists are likely to have an impact on compliance with hand hygiene during health care (1, 33). In some religions, and even within the same religion, various degrees of interpretation exist concerning alcohol prohibition. In general, those religions with an alcohol prohibition in everyday life demonstrate a practical view accepting the most valuable approach to optimal patient care. Consequently, no objection is raised against the use of alcohol based products for environmental cleaning, disinfection or hand hygiene.

When implementing a hand hygiene campaign with an ABHR in a healthcare setting where religious groups are represented, it is important to include focus groups on this topic to allow HCWs to raise concerns about the use of ABHRs, help them to understand the evidence underlying this recommendation, and to identify possible solutions to overcome obstacles (1). The same process should be used when implementing ABHRs into areas where there may be a cultural problem with alcohol abuse.

## 4.12 Fire Safety

Although some OH&S Fire Safety Officers initially expressed concerns regarding the location of ABHR throughout hospitals, a number of studies have confirmed the safety of ABHR (48-49). Despite many years of use, there have been no documented fires directly related to the presence of ABHR in hospital wards in Australia, and only one documented in the USA. To further reduce the risk of fire following the application of ABHR, hands should be rubbed together until dry and all alcohol is evaporated (1). ABHR is not considered a useful terrorist weapon or threat (See [Appendix 8](#) and [21](#)).

## 4.13 Ingestion

Accidental and intentional ingestion of alcohol based products used for hand hygiene have been reported (1). Alcohol toxicity can occur after ingestion, but the effects depend on the amount ingested, and the age/size of the person ingesting it.

Symptoms and signs of alcohol intoxication include: dizziness, lack of coordination, hypoglycaemia, abdominal pain, nausea, vomiting, and haematemesis. Signs of severe toxicity include respiratory depression, hypotension and coma.

With careful consideration of ABHR product placement in high risk areas (i.e. mental health, alcohol detoxification units) the risk of this potential problem can be minimised (see [Appendix 21](#)).



## 4.14 Cost

The promotion of hand hygiene is highly cost effective, and the introduction of a waterless system for hand hygiene is a cost-effective measure (1). While the purchase price of ABHR is an important factor in product selection, it is far less important than the acceptability of the ABHR to HCWs. There is little point having a cheap ABHR available that has poor HCW acceptance and is therefore rarely used, resulting in poor rates of HH compliance. The key driver for ABHR selection should not be simple purchase cost (10). However, a recent study in the dental setting has reported that use of ABHR is more cost effective than antimicrobial soap (9), and the expenditure on ABHR products when compared with excess hospital costs associated with HAI can easily be justified (10).

Cost is an important consideration on set-up, and the ongoing funding source within the health service needs to be clearly identified for the sustainable success of the program.

## 4.15 Storage and Safety

Ensure a material safety data sheet (MSDS) for ABHR is available in areas where ABHR is stored (check with local OH&S regulations).

All ABHR products are flammable with flash-points ranging from 21°C to 24°C, depending on the type and concentration of alcohol present. They should be stored away from high temperatures or flames (18). When considering the requirements for minor storage, the total quantities of all flammable liquids must be considered. Minor storage of all flammable liquids is not to exceed 10 litres per 50m<sup>2</sup> of floor space (AS 1940-2004, Section 2, Table 2.1).

For further product safety information see [Appendix 8](#) and [Appendix 21](#), or contact your local fire service.

## 4.16 Paediatric Exposure to Alcohol

ABHR can be placed in paediatric wards/facilities; however care should be taken in this decision. The placement of ABHR within NICU, SCN, maternity wards, and on cots should follow the HHA recommendations of product placement at point of care.

The placement within general paediatric wards should remain within the point of care, except in situations of intellectual impairment or alcohol abuse where the child could unintentionally or intentionally harm themselves. Personal bottles of ABHR could be used in any area where ABHR cannot be placed at the point of care.

Recent research has shown increasing use of ABHRs in the home and community settings, which have corresponded with an increase in the number of calls to poison's centres regarding children misusing the products. However, Miller et al in 2009 report that ABHRs appear relatively safe when misused by children under six years of age as the exposure invariably occurred as a brief 'taste' or accidental ocular or dermal exposure, resulting in little or no toxicity (50). This is supported by anecdotal evidence from Australian Poisons Centres.

Further research has shown that use of an ABHR by children in day care centres is safe. Even though children put their hands in their mouth or in contact with other mucous membranes directly after ABHR use, there was nil measurable alcohol detected by breathalyser in any of the children tested (51).



## Chapter 5

# Health Care Worker Education

### 5.1 Aim

To develop and maintain an ongoing education program to initiate and sustain HH behaviour change. All HCWs and support staff should be included in educational activities.

Education is critical to the success of the culture change program and careful planning is essential.



## 5.2 Education for all health care workers

HCW education is a key component of any multi-modal intervention strategy. Basic educational sessions for all HCWs should include the following:

- Definition, impact and burden of HCAI
- Common pathways for disease transmission, specifically the role of hands
- Prevention of HCAI and the role of hand hygiene
- 5 Moments of Hand Hygiene – with key messages
  - When to perform hand hygiene
  - Use of alcohol based hand rubs
  - Use at point of care

### 5.2.1 HHA Hand Hygiene Educational Tools

HHA has an array of tools available to assist educational sessions as outlined above:

- See [Appendix 2](#) – HHA Toolkit of Resources for a complete list
- HHA Online Learning package – this package targets HCWs and provides basic information about HH. Ideally, all HCWs should undertake this package on commencement of employment and then on an annual basis  
[www.hha.org.au/LearningPackage.aspx](http://www.hha.org.au/LearningPackage.aspx)
- Video demonstration of each of the 5 Moments  
[www.hha.org.au/home/moment-1.aspx](http://www.hha.org.au/home/moment-1.aspx)
- Generic slide presentations:
  - Targeting specific groups of HCWs on HH
  - 5 Moments[www.hha.org.au/ForHealthcareWorkers.aspx](http://www.hha.org.au/ForHealthcareWorkers.aspx) .

All of the above resources and more are available at [www.hha.org.au](http://www.hha.org.au)

HHA have also developed the “5 Moments for Hand Hygiene” DVD. Although primarily used for training Auditors, the DVD has many examples of the 5 Moments that can be used for the above sessions.



## 5.2.2 Delivery of the Hand Hygiene Education

Staff within healthcare facilities not only change frequently but are also very mobile. Therefore as well as introductory educational sessions, a program of formal regular sessions and updates should be planned. These could take the form of specific orientation programs, in-service lectures or special workshops. Where possible, Coordinators should work with education departments in their facility to identify the most appropriate methods specific to the audience and facility.

On a day to day basis in health care facilities, many opportunities arise for informal education. Informal educational opportunities may include:

- Medical and Nursing rounds
- Nurse Unit Manager/clinical unit meetings
- Ward "walkabouts"
- Increased presence on the ward by the HH Program Officer and Infection Control staff
- Program staff acting as a resource for all staff
- Working one-on-one with staff to improve HH practices
- Corridor/tearoom conversation
- Prompt feedback of HH compliance results, including rewards/incentives for good results.

High profile promotional activities are also recommended to raise awareness of HH. For example, these can be planned to coincide with World Hand Hygiene Day (5<sup>th</sup> May each year) or Infection Control Awareness week. These may include:

- Promotional products
  - Stickers for staff identification badges once HCWs have attended an education session
  - Pens and sticky note pads
- Incentives may be offered as a form of positive re-enforcement once all staff have completed the education and assessment package
  - E.g. wine, chocolates, pens, stickers and movie passes.



## 5.3 Education of Medical staff

Some of the strategies suggested above may not be appropriate for medical staff. Numerous published studies suggest that medical staff repeatedly under-perform in HH compliance and are difficult to reach with education to generate behaviour change (1).

HH Medical Champions should become involved and encourage medical staff to act as role models for all others. Although a multi-modal approach is likely to be most effective, one-on-one discussions with key/high profile medical officers are especially valuable, particularly for senior medical staff.

### Successful programs should:

- Identify those willing to be role models
- Discuss any potential stumbling blocks to implementation with medical staff
- Identify medical opinion leaders, “Clinical Champions” and “Heads of Unit ”
- Regular attendance by Infection Control staff at medical ward rounds, enables informal HH education to senior and junior medical staff during these rounds
- As with all HCWs, medical staff should be regularly assessed for their rates of HH compliance and be provided with rapid feedback of results
- Regular scientific presentations at Surgical and Medical meetings, including Grand Rounds are especially important
- Target interns and RMOs during formal education sessions and orientations that are a required component of all medical training programs
- Timely feedback from observational studies
- Ensure all medical staff are credentialed in HH.

HHA have an online learning package tailored specifically for medical staff which can be found at <http://www.hha.org.au/LearningPackage/olp-home.aspx>

## 5.4 Education of Auditors

The education sessions suggested above will not be adequate to equip staff to Audit for 5 Moment compliance. This requires specific training, and may not be suitable for some groups of HCWs. Auditor training can only be provided by a coordinator who has attended a HHA workshop. Refer to [Chapter 7](#) for details on auditor training.



## 5.5 Education to Enhance Hand Hygiene Outcomes

### 5.5.1 Jewellery

The wearing of jewellery should not inhibit the ability of the HCW to perform correct hand hygiene. Several studies have shown that skin underneath rings is more heavily colonised than comparable areas of skin on fingers without rings (1). Wearing rings increases the carriage rate of gram negative bacteria and enterobacteriaceae on the hands of HCWs (52).

Hand hygiene policies and education should include a section on appropriate jewellery to be worn in the workplace. The consensus recommendation from WHO is to strongly discourage the wearing of rings or other jewellery during healthcare. The wearing of a simple flat band during routine care may be acceptable, but in high risk settings all rings or other jewellery should be removed (1).

### 5.5.2 Fingernails, nail polish and artificial nails

Numerous studies have documented that subungual areas (under the nail) of the hand harbour high concentrations of bacteria (1). Freshly applied nail polish does not increase the number of bacteria recovered from periungual skin, but chipped nail polish may support the growth of larger numbers of organisms on fingernails (1). Even after careful handwashing or surgical scrubs, HCWs often harbour substantial numbers of potential pathogens in the subungual spaces (1).

HCWs who wear artificial nails are more likely to harbour gram negative pathogens on their fingertips than are those who have natural nails, both before and after handwashing (2). Whether the length of natural or artificial nails is a substantial risk factor is unknown, because the majority of bacterial growth occurs along the proximal 1 mm of the nail adjacent to the subungual skin (1-2). Long, sharp fingernails, either natural or artificial, can puncture gloves easily, they may also limit a HCWs performance in hand hygiene practices (1).

Each healthcare facility should develop policies on the wearing of artificial fingernails or nail polish by HCWs. The consensus recommendations from WHO are that HCWs do not wear artificial fingernails or extenders when having direct contact with patients and natural nails should be kept short ( $\leq 0.5\text{cm}$  long) (1).



## Chapter 6

# The 5 Moments for Hand Hygiene

### 6.1 Aim

To ensure all staff involved in the HHA 5 Moments for Hand Hygiene program clearly understand the 5 Moments for Hand Hygiene.



## 6.2 What are the 5 Moments for Hand Hygiene?

- Moment 1:** Before touching a patient
- Moment 2:** Before a procedure
- Moment 3:** After a procedure or body fluid exposure risk
- Moment 4:** After touching a patient
- Moment 5:** After touching a patient's surroundings

### 6.2.1 The Levels of Evidence to Support the 5 Moments for HH (2)

**1A** - Strongly recommended for implementation and strongly supported by well designed experimental, clinical, or epidemiological studies

**1B** - Strongly recommended for implementation and supported by some experimental, clinical, or epidemiological studies and a strong theoretical rationale

#### **Moment 1**

Before and after touching patients (1B)

#### **Moment 2**

Before handling an invasive medical device for patient care, regardless of whether or not gloves are used (1B)

If moving from a contaminated body site to a clean body site during patient care (1B)

#### **Moment 3**

After removing gloves (1B)

After contact with body fluids or excretions, mucous membranes, non-intact skin, or wound dressings (1A)

If moving from a contaminated body site to a clean body site during patient care (1B)

#### **Moment 4**

Before and after touching patients (1B)

#### **Moment 5**

After contact with inanimate surfaces and objects (including medical equipment) in the immediate vicinity of the patient (1B)



## 6.2.2 Key terms within the 5 Moments for HH

### Patient

Refers to any part of the patient, their clothes, or any medical device that is connected to the patient.

### Procedure

Is an act of care for a patient where there is a risk of direct introduction of a pathogen into the patient's body.

### Body Fluid Exposure Risk

Any situation where contact with body fluids may occur. Such contact may pose a contamination risk to either HCW or the environment.

### Patient Zone

Includes the patient and the patient's immediate surroundings.

Assumptions are generally made that within the patient zone the patient flora rapidly contaminates the entire patient zone; and the patient zone is cleaned between patients.

Within the patient zone there are 2 critical sites, the clean site (e.g. IV access point) that needs to be protected against micro-organisms, and the body fluid site (e.g. IDC) that leads to the HCWs hands being exposed to body fluid.

### Healthcare Zone

Is the area outside of the patient zone.

Assumptions are generally made that within the healthcare zone there are organisms foreign and potentially harmful to all patients, and that transmission of these pathogens to the patient results in exogenous infection.



## 6.3 The 5 Moments in Detail

### Moment 1 – Before Touching a Patient

#### WHY:

To protect the patient against acquiring potential pathogens from the hands of the HCW.

#### WHEN:

<b>Touching a patient in any way:</b>	Shaking hands, Assisting a patient to move, Allied health interventions, Touching any invasive medical device connected to the patient (e.g. IV pump, IDC)
<b>Any personal care activities:</b>	Bathing, Dressing, Brushing hair, Putting on personal aids such as glasses
<b>Any non-invasive observations:</b>	Taking a pulse, Blood pressure, Oxygen saturation, Temperature, Chest auscultation, Abdominal palpation, Applying ECG electrodes, CTG
<b>Any non-invasive treatment:</b>	Applying an oxygen mask or nasal cannulae, Fitting slings/braces, Application of incontinence aids (including condom drainage)
<b>Preparation and administration of oral medications:</b>	Oral medications, Nebulised medications
<b>Oral care and feeding</b>	Feeding a patient, Brushing teeth or dentures
<b>Contacts with a patient's surroundings before, during &amp; after any of the above:</b>	Bedside table, Medical chart

#### TO PREVENT: Cross Colonisation of Patients

HCWs may have any number of organisms on their hands, if there is no hand hygiene prior to touching the patient these micro-organisms can be transferred to the patient.



## Moment 2 – Before a Procedure

### WHY:

To protect the patient from potential pathogens (including their own) from entering their body during a procedure.

### WHEN:

**Insertion of a needle into a patient's skin, or into an invasive medical device:**

Venipuncture, Blood glucose level, Arterial blood gas, Subcutaneous or Intramuscular injections, IV flush

**Preparation and administration of any medications given via an invasive medical device, or preparation of a sterile field:**

IV medication, NGT feeds, PEG feeds, Baby feeds, Dressing trolley set up

**Administration of medications where there is direct contact with mucous membranes:**

Eye drop instillation, Suppository insertion, Vaginal pessary

**Insertion of, or disruption to, the circuit of an invasive medical device:**

Procedures involving the following:  
ETT, Tracheostomy, Nasopharyngeal airways, Suctioning of airways, Urinary catheter, Colostomy/ileostomy, Vascular access systems, Invasive monitoring devices, Wound drains, PEG tubes, NGT, Secretion aspiration

**Any assessment, treatment and patient care where contact is made with non-intact skin or mucous membranes:**

Wound dressings, Burns dressings, Surgical procedures, Digital rectal examination, Invasive obstetric and gynaecological examinations and procedures, Digital assessment of newborn palate

### TO PREVENT: Endogenous and exogenous infections in patients

HCWs may have any number of organisms on their hands, or they may pick up micro-organisms from the patients skin, if there is no hand hygiene immediately prior to a procedure these micro-organisms can be enter the patient's body.

### Moment 3 – After a Procedure or Body Fluid Exposure Risk

#### WHY:

To protect yourself and the healthcare surroundings from potential pathogens from the patient.

#### WHEN:

After any Moment 2:

See Moment 2

#### After any potential body fluid exposure:

Contact with a used urinary bottle / bedpan,  
Contact with sputum either directly or indirectly via a cup or tissue, Contact with used specimen jars / pathology samples, Cleaning dentures, Cleaning spills of urine, faeces or vomit from patient surroundings, After touching the outside of a drain

Contact with any of the following:  
Blood, Saliva, Mucous, Semen, Tears, Wax, Breast milk, Colostrum Urine, Faeces, Vomitus, Pleural fluid, Cerebrospinal fluid, Ascites fluid, Organic body samples e.g. Biopsy samples, Cell samples, Lochia, Meconium, Pus, Bone Marrow, Bile

#### TO PREVENT: Infection in HCWs and / or cross colonisation of the healthcare environment and HCWs

After touching a patient the HCW has the patient's micro-organisms on their hands; these micro-organisms can be passed on to whatever the HCW is in contact with next.



## Moment 4 – After Touching a Patient

### WHY:

To protect yourself and the healthcare surroundings from potential pathogens from the patient.

### WHEN:

**After any Moment 1 except where there has been a potential body fluids exposure:** See Moment 1 and 2

### TO PREVENT: Infection in HCWs and / or cross colonisation of the healthcare environment and HCWs

After touching a patient the HCW has the patient's micro-organisms on their hands; these micro-organisms can be passed on to whatever the HCW is in contact with next.

## Moment 5 – After Touching a Patient's Surroundings

### WHY:

To protect yourself and the healthcare surroundings from potential pathogens from the patient's surroundings.

### WHEN:

**After touching the patient's immediate surroundings when the patient has not been touched:**

Patient surroundings include: Bed, Bedrails, Linen, Table, Bedside chart, Bedside locker, Call bell/TV remote control, Light switches, Personal belongings (including books, Mobility aids), Chair, Foot stool, Monkey bar

### TO PREVENT: Infection in HCWs and / or cross colonisation of the healthcare environment and HCWs

After touching the patient's environment the HCW has micro-organisms on their hands; these micro-organisms can be passed on to whatever the HCW is in contact with next.

## 6.4 Two Patients within the Same Patient Zone

Two or more patients may be in such close contact that they occupy the same physical space and touch each other frequently. For example, a mother and her newborn child, or twins occupying the same cot. The two close patients may be viewed as occupying a single patient zone. Hand hygiene is still required when entering or leaving the common patient zone, and before and after procedures, but the indication for hand hygiene when moving between the two patients is probably of little preventative value because they are likely to share the same microbial flora (1).

See [Appendix 14](#) for detailed examples of the 5 Moments for Hand Hygiene.



# Chapter 7

## Hand Hygiene Measures: Auditing Hand Hygiene Compliance

### 7.1 Aim

To accurately assess HH compliance (HHC) in accordance with published guidelines using a standardised HH observation assessment tool (1, 53).

To achieve a high rate of HHC, HCWs need education, clear guidelines, some understanding of infectious disease risk, and acceptable hand hygiene products (1).



### 7.1.1 Auditing with the 5 Moments for Hand Hygiene Tool

HHC auditing is the established outcome measure for assessing the effectiveness of a hand hygiene program within the National Hand Hygiene Initiative. HHC is a valid and reliable measure within the acute care sector, in both public and private hospitals throughout Australia. HHA anticipate receiving data from most acute hospitals within Australia.

Currently HHA do not recommend routine HHC auditing as an outcome measure in the non-acute, primary care, or mental health setting. HHA recommend the use of other program evaluation tools (staff HH knowledge surveys, product placement and availability surveys) within non-acute primary care, and mental health settings.

All facilities should be aware of their jurisdictional requirements when planning measurements of their hand hygiene program.

## 7.2 HHC Training

The approach to accurately assessing HHC according to the 5 Moments for Hand Hygiene is described below. In addition, training in the HHC assessment tool, data entry and data analysis will be provided at training workshops conducted by Hand Hygiene Australia. Further support is available to all hospitals by contacting the Hand Hygiene Australia representative for your state or territory (see website for contact details [www.hha.org.au](http://www.hha.org.au) ).

## 7.3 Methodology for Collection of HHC Data

Direct observation by trained observers is the gold standard to monitor compliance with optimal hand hygiene practice (1).

Any 'unsafe' practices that are observed during hand hygiene auditing should be addressed immediately or reported to the appropriate manager for follow-up; otherwise compliance rates should be reported after an audit has been fully completed (50).

Observation does not justify infringing the principle of patient privacy. Auditors should show discretion regarding where they place themselves and their movements whilst conducting audits (51). It is recommended that patients be informed on admission that hand hygiene audits are regularly conducted as a quality improvement activity. Patients or their family may request they not be involved in an audit.

This section details the decisions needing to be made before a HH Compliance audit can be conducted.



### 7.3.1 Hand Hygiene Auditors

Careful thought and planning needs to be put into choosing the right people to conduct the HHC audits. The appropriate people will vary between facilities.

**Points to consider include:**

- Availability to attend HHA Auditor training
- Have time available to conduct audits
- Have a good understanding of auditing/feedback/education processes
- Have a background as a clinical health professional
- Acknowledge and understand safety and privacy concerns of patients and staff.

#### 7.3.1.1 Infection Control Practitioners (ICPs) as Auditors

In many organisations ICPs observe HH and collect information about performance.

**Advantages:**

- ICPs have a knowledge of hand hygiene guidelines
- Can intervene and educate on the spot to correct unacceptable performance
- Can provide immediate feedback to staff for good hand hygiene practices
- Are usually already involved in teaching and training of all staff in correct hand hygiene principles
- Raises profile of ICPs by increased time spent on the wards.

**Disadvantages**

- Prevents ownership of ward/department staff in monitoring hand hygiene
- May promote HH as an infection control problem rather than a hospital wide issue.

#### 7.3.1.2 Other personnel as Auditors

Instead of ICPs, other clinical staff could conduct audits. For example, ward nurses, allied health staff, students, return to work program participants.

**Advantages:**

- Could promote widespread acceptance/ownership/participation in activities to improve hand hygiene within their area
- Auditor training would increase knowledge of hand hygiene guidelines and highlight that HHC is an organisational concern.

**Disadvantages:**

- Would need to take time out of their usual position to conduct audits
- May not feel comfortable giving feedback or correcting unacceptable performance
- ICPs would still need to have a full understanding of the auditing process as they would likely still be doing the education component of the program.



## 7.3.2 Training Auditors

There are two types of training proposed by the HHA team: 'Gold standard' auditing and general auditing. A gold standard auditor has the ability to train further staff at their own facility in the skills of auditing. The general auditor is enabled to audit only.

### 7.3.2.1 Gold Standard Auditor Training

Participants should attend a workshop run by a HHA coordinator, and pass the required assessments, which results in them being awarded a 'Gold Standard' status. Prior to attending the workshop participants are required to complete online:

- Workshop registration form
- Pre-Reading [Chapter 6](#) of this HHA Manual
- Pre-Training Quiz.

**During this workshop the following topics will be covered:**

- History of Hand Hygiene
- Hand Hygiene Program Implementation
- 5 Moments in Detail
- How to use the audit tool
- How to enter data on the website
- Written Quiz
- Auditing time on the wards
- DVD Quiz
- Reporting requirements to HHA
- Promotion of the Hand Hygiene Program
- Education requirements for training staff in Hand Hygiene
  - General hospital staff
  - Other auditors.

### 7.3.2.2 General Auditor Training

Participants can either attend a workshop run by a HHA coordinator, or be trained in their own facility by a Gold standard auditor. Regardless of trainer the following topics should be covered:

- 5 Moments in Detail
- How to use the audit tool
- How to enter data on the computer
- Written Quiz
- Auditing time on the wards
- DVD Quiz.

See [Appendix 16](#) - How to Train Auditors Guide for detailed instructions.



### 7.3.2.3 Gold Standard and General Auditor Training Hurdle Requirements

All participants of the HHA 5 Moments for HH Auditing training are required to pass the following assessments to become accredited:

- Written Quiz
- DVD Quiz
- Appropriate auditing on the wards.

If a participant does not pass the assessments they are required to either:

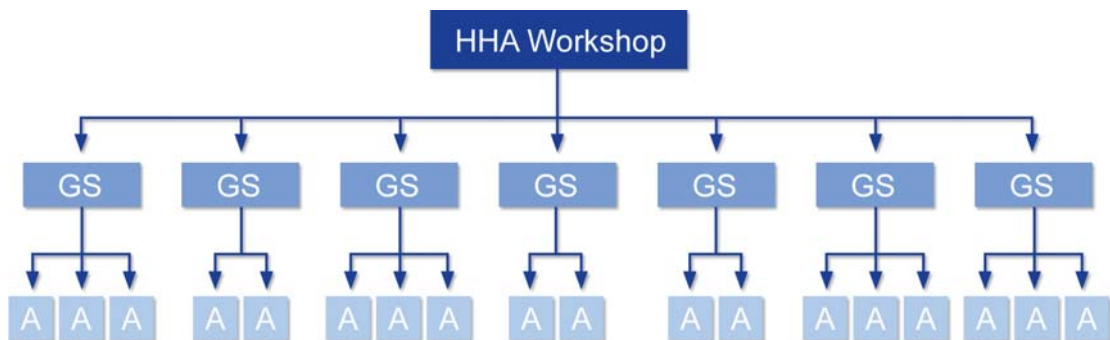
- Pass a supplementary quiz
- Have further follow-up with an accredited auditor
- Repeat the training workshop.

The participant’s total score on the initial assessments will dictate which of the above is required.

### 7.3.2.4 Roles of Auditors

Once the training has been completed and a full comprehension of auditing and data entry has been shown then that person can be considered the approved auditor for their facility.

To ensure consistency of the auditing program and to ensure validation of auditors, people trained by HHA become the “Gold standard” auditors. The people the Gold Standard auditors train become auditors. The auditors are not able to train anyone in the auditing process (see diagram below).



	Taught by	Can teach 5 Moments	Can conduct audits	Can teach how to audit
<b>Gold Standard</b>	HHA	Yes	Yes	Yes
<b>Auditor</b>	Gold Standard	Yes	Yes	No



### 7.3.2.5 Inter-rater and Intra-rater Reliability and Validation

Inter-rater reliability should be addressed in the auditor training programs by pairing HH observers for observations of the same session and then comparing observations recorded, using the HHA trained and validated person as the “gold standard”. Each HH observer should be paired with each of the other validated observers (if more than 2 observers). Until there is >90% inter-rater agreement in all recordings (e.g. type of HCW, HCW activity, HH Moment, HH performance), the official data collection process should not begin.

Intra-rater reliability should be addressed through use of the HHA 5 Moments Program DVD. This DVD should be observed on at least two occasions, a few days apart. Data should be recorded on the standard data collection form. The rate of agreement for all recordings is then calculated. If there is less than 90 % agreement, HH observers should seek further training.

Practice sessions may be necessary for HH observers prior to each data collection period to ensure reliable results. Careful attention is required to ensure that observations are recorded correctly and there is consistent reporting, not only by the individual auditors (intra-rater reliability) but also between the various auditors (inter-rater reliability). The HH team should discuss issues as they arise and reach a consensus opinion/approach.

### 7.3.2.6 Annual Review for HHA Gold Standard Auditors

As of 2011 all Gold Standard Auditors will be required to complete auditing skills validation training on an annual basis. To maintain ‘auditor’ status all auditors should also collect a minimum of 100 Moments each year.

Where possible HHA will also encourage attendance at a HHA Gold Standard Auditors Forum.

Further details will be available on the HHA website.

### 7.3.2.7 Overcoming Bias in Auditing

Observer bias is introduced by inter-observer variation in the observation. The HHA training schedule of validation of auditors has been created to minimise this bias.

Selection bias is introduced by selecting HCWs, care settings, and observation times with specific hand hygiene behaviour. In practical terms, this bias can be minimised by randomly choosing locations (from your set reporting wards) and times of the day to audit.

When HCWs know HH compliance is being measured, they often initially attempt to behave correctly. This is known as the “Hawthorn Effect” (54). Recent evidence suggests that the Hawthorn effect may only increase compliance in areas that already have good compliance rates, but there will be no noticed effect on wards starting with low compliance (55).

However, with repeated observations, HCWs generally grow accustomed to the observer and are less affected by their presence (56), particularly if they know the auditor and are comfortable being observed.



### 7.3.3 Equipment Required to Conduct a Hand Hygiene Audit

The following equipment is required to conduct an audit:

- Clipboard and pen
- Copies of HHA Audit forms (see [Appendix 9](#))
- HHA coding sheet (see [Appendix 10](#))
- HHA audit ward summary sheet (see [Appendix 12](#))

OR

- PDA / smart phone with HHA HHC application.

### 7.3.4 HCW Definitions Required for Auditing

HCW Code	Type of HCW	Extended Definition
N	Nurse	All nurses – RN, Div 1, Div 2/EN, Midwives, Agency staff, Domiciliary nurses, Psychiatric
DR	Medical Doctor	All doctors – Consultants, Registrars, Residents, Interns, Visiting Consultants, GPs, Dentists
PC	Personal Care staff	PSA, AIN, PCW, wardsmen, orderly, warders, ward/nursing assistants
AH	Allied Health	Physiotherapists, Occupational therapists, Dieticians, Speech Pathologists, Radiographers, Pharmacists, P&O, Allied Health Assistants, Podiatrists, Music/Play therapists, Audiologists, Plaster technicians, ECG technician
D	Domestic staff	Staff engaged in the provision of food and cleaning services, maintenance people
AC	Administrative and Clerical staff	Ward clerks
BL	Invasive technician	Phlebotomists, Dialysis technicians
SN, SAH, SDR, SPC	Students	Students of N, AH, DR, PC
O	Other	Persons not categorised elsewhere



### 7.3.5 How to Conduct a HHA Hand Hygiene Compliance Audit

- Select wards for HH Compliance audits as per [Chapter 2](#)
- Allocate time to conduct audits
  - Aim is to start auditing 6-8 weeks prior to the due date for data submission
  - Try to ensure you audit at many different times of the day to avoid selection bias. Sessions should be undertaken in an ad hoc manner during both morning and afternoon shifts
  - Busy periods are the best time for HH observations
  - Day-to-day variation in HH compliance may occur – therefore, observation sessions are best run over several days/weeks
- Information regarding when the observation sessions will be occurring should be provided to ward Unit Managers prior to commencing compliance auditing
- Wards / departments should be asked to ensure ABHR products are in all the appropriate places before auditing commences
- If there are barriers to HH e.g. No available ABHR, soap or paper towels this should be recorded in the notes section of the audit tool, then reported to the shift or unit manager prior to leaving the area
- Arrive at target ward / department and introduce self to the shift manager and inform them of your role
- Always perform HH yourself upon entering a ward to audit. It is very important to lead by example
- HH auditors are encouraged to be open and honest about what you are doing, and show the audit tool and how the data collected is deidentified. This may be for staff, patients or visitors
- There needs to be at least one patient and a HCW present in a room to start auditing. If neither are present, move to another room
- Observers need to position themselves to view the patient bed, sink, and ABHR area
- When patients' bed curtains are drawn, permission should be sought from the relevant HCW and patient to allow auditors to continue to view activities in the area. Although there may be some occasions when this is not appropriate, these are rare. Observing HCW activities behind closed curtains in the ICU is often necessary
- HH compliance should be assessed on all types of HCWs who enter observed ward bays. The presence or absence of a convenient location from which to observe patient beds and HH facilities may impact on which patient bays are selected for observation
- The number of HCWs observed at one time depends on their level of activity and the competency of the auditor. More than one HCW can be observed at the same time, provided their HH *Moments* can be accurately observed and recorded. If this is not possible, then the compliance of additional HCWs should not be recorded until the index HCW has left the bay, or has ceased activity



- It is better to record fewer Moments accurately than many Moments inaccurately. If no activity occurs, HH observers should proceed to another room. Reasons for no activity may include:
  - No HCW present in the room
  - HCW activities were performed unobserved behind closed curtains
  - All patients leave the bay during the observation session
  - The HCW may continue with one Moment for a long time i.e. Allied health assessment – Moment 1 may take 20 minutes, Nursing procedure may take 15 minutes
- Try not to observe the same HCW for the entire audit session. The aim is to audit a cross section of all HCW categories that work on that ward
- Moments should not be recorded before they have been undertaken. If you are unsure if a HCW performed any HH then do not record it
- A HH Moment is only documented when the field observer can accurately observe the HCW and the *Moment* that has been completed. If an auditor is unsure whether the observed HCW performed HH, then such *Moments* should not be recorded. The only exception is when a HCW is observed to enter a room and go directly to the patient.
- As per Note 3 of The Rules: The HCW must be observed to perform HH as they approach the patient. If hand hygiene is not observed it should be recorded as a missed action
- A Moment finishes when a HCW:
  - Moves from one patient to another
  - Leaves the room on completion of patient care
  - Touches the curtain partition in a multi-patient room
  - HCW moves from touching a patient to doing a procedure or vice versa
- A Moment can finish in another area outside a patient room if patient care is not yet completed e.g. transporting a bedpan to the pan room
- The HHC audit session has no specific time frame, it can be conducted for as long or as little as the auditor has time for
- At the conclusion of an audit session the following needs to be completed:
  - Thank the shift manager and highlight any problems that need addressing immediately e.g. No HH product available
  - Complete the audit form by filling in the finish time and duration of session, and by tallying up the total Moments collected and the total correct Moments collected
  - Do HH yourself prior to leaving the ward.

**There can be circumstances where it is not appropriate to conduct a HH observation session; these include:**

- Emergency situations where HH is secondary to patient safety (e.g. when any hospital ‘code’ is called)
- In palliative care situations
- If the patient, or patient’s family object
- During private discussions between medical staff and patient/ patient’s family.

### 7.3.6 How to Use the HH Audit Tool

- The HHA HHC audits should only be conducted by trained and validated staff
- For each session fill in the demographic details on the top of the form on arrival at target ward
  - Health Service = Hospital or Network name
  - Session number = The audit number for that particular ward which is then transferred to the HH ward summary sheet (see [Appendix 12](#))
    - > The first audit on a specific ward will be session no. 1
    - > The second audit on the same ward will be session no.2
    - > The first audit on a different ward will be session no. 1 on that ward
  - Start and Finish times are for your own personal statistics to enable you to calculate the amount of time it takes to conduct each audit
- For each Moment observed the following should be recorded on the audit form:
  - HCW – needs to be filled in every time a Moment is observed (see [Section 7.3.4](#))
  - Moment – fill in the Moment observed.  
Only one Moment should be filled in per box. If multiple Moments are observed then multiple boxes need to be filled in (see [Appendix 11](#))
  - Action – needs to be filled in for every Moment observed
    - > If no HH action is observed then it is recorded as a missed action
    - > If the HCW performs HH then proceeds to touch their face/nose/mouth or touches items in the healthcare environment prior to touching the patient then this should be recorded as a missed HH action
    - > If a HCW is observed to do HH incorrectly (e.g. one handed, minimal volume ABHR or no soap) this should be recorded as a missed action
  - Gloves – are only recorded if the HCW puts gloves on in a before Moment, takes gloves off in an after Moment, or continues from one Moment to another with the same pair of gloves
    - > Even if gloves are worn for patient care HH still needs to be performed and recorded before and after glove use
    - > If no gloves are worn then the “gloves” box is left blank.



## 7.4 Two Moments for Hand Hygiene “Double Moments”

Two moments for hand hygiene may sometimes fall together. Typically, this occurs when moving directly from one patient to another without touching anything in between. In this situation a single hand hygiene action will cover the two moments for hand hygiene, as Moments 4 and 1 coincide.

Another example of simultaneous moments is when moving from touching a patient to performing a procedure on that same patient; Moment 4 and Moment 2 coincide. However, when auditing in either situation, both Moments are recorded as individual Moments on the audit tool.

## 7.5 When NOT to record a Moment

HHC is audited by Moments; it is not audited by HH action.

It is important to understand that HH actions not corresponding to an opportunity (or reason for HH) and therefore “additional” and not required should not be taken into account by the observer. For example, HCW walks into a patient’s room, does HH then walks out without touching anything – No Moment is recorded.

## 7.6 When NOT to Audit

The 5 Moments for Hand Hygiene Program has been designed for ALL healthcare facilities. Product placement, staff education and program promotion are relevant in all healthcare settings whether an acute tertiary facility, or the local GP clinic. However, the actual Hand Hygiene auditing has been designed specifically for acute hospitals. For all other healthcare facilities HHA would recommend educating their staff about the 5 Moments, and conducting other program audits that are available on the HHA website under the heading of Additional Audit Tools.

[www.hha.org.au/ForHealthcareWorkers/auditing.aspx](http://www.hha.org.au/ForHealthcareWorkers/auditing.aspx)



## 7.7 Rules for Auditing the 5 Moments

Rules	Extended Definition
<b>Moment 1</b>	<b>HH Moment 1</b> is recorded only once the HWC touches the patient.
<b>Moment 2</b>	<b>HH Moment 2</b> is recorded immediately prior to any procedure Once HH has been performed, nothing else in the patient's environment can be touched prior to the procedure starting.
<b>Moment 3</b>	<b>HH Moment 3</b> is recorded immediately after a procedure of body fluid exposure risk: <ul style="list-style-type: none"> <li>• Nothing else should be touched prior to performing hand hygiene</li> <li>• Touching the outside of a drain or drainage bag (eg urinary catheter, wound drain, chest tube drain, CSF drain), even when the circuit is not broken, is considered a body fluid exposure risk</li> <li>• Moment 3 may be recorded as a stand alone HH Moment when there is a body fluid exposure risk, but the HCW has not touched the patient - eg cleaning a spill of vomit, urine or faeces.</li> </ul>
<b>Moment 4</b>	<b>HH Moment 4</b> is recorded after touching the patient <ul style="list-style-type: none"> <li>• Touching the patient surroundings after touching the patient is recorded as a single Moment 4.</li> <li>• If after Moment 3 there is touching of patient surroundings this is recorded as a Moment 4.</li> </ul>
<b>Moment 5</b>	<b>HH Moment 5</b> is recorded when the HWC leaves the patient zone after touching the patient's immediate surroundings and the patient has not been touched. <ul style="list-style-type: none"> <li>• When multiple items in the patient surroundings are touched, only one Moment 5 is recorded.</li> </ul>
Notes	
<b>Note 1</b>	Generally for every 'before' Moment there should be an 'after' Moment recorded, unless the auditor does not witness the action. <b>Moment 1</b> is generally followed by a <b>Moment 4 or Moment 3</b> <b>Moment 2</b> is generally followed by a <b>Moment 3</b> <b>Moment 5</b> is not paired with other moments  There are very few situations when two 'afters' may be recorded sequentially however you will never have two 'before' moments in a row.
<b>Note 2</b>	The HWC must be observed to perform HH as they approach the patient. If HH is not observed it should be recorded as a 'missed' action (ie HH not performed).
<b>Note 3</b>	No 'before' Moment can be recorded if auditing commences after a HCW is already touching a patient, or in the process of performing a procedure.  No 'after' Moment can be recorded unless the moment is observed.
<b>Note 4</b>	Patient bed curtains are outside the patient zone as they are frequently contaminated. Touching the curtains is leaving the patient zone. HH should be performed between touching the curtains and touching the patient.
<b>Note 5</b>	The Aussie 5 Moments for HH audit tool rewards staff who clean their hands at the most important times eg Moving from touching a patient to performing a procedure M1, M4, M2, M3 are recorded as 4 Moments, but the HCW is only required to perform 3 HH actions.

## 7.8 Auditing Requirements

### 7.8.1 HH Compliance Data Required by HHA

To achieve appropriately valid results, HH compliance should be assessed on a defined minimum number of HH observations (Moments). The time taken to complete the required number of observations will vary depending on the level of clinical activity in the observed area, the experience of the auditor, and the time of day the audit is conducted. Nevertheless, the key determinate of adequate HH compliance assessment is the use of HH Moments, not the time taken.

The data collection schedule will be influenced by the number of acute beds in each facility (see Table below), the number of trained staff available to undertake HH observations, and the option taken for the selection of wards (See [Section 2.3.3](#)). HH compliance rates should be reflective of a cross-section of the institutions' HCWs, rather than just repeated or prolonged observations on a small number of HCWs.

The time taken to complete all the observation sessions will depend upon the number of HH Moments observed for each session, the number of observation sessions completed each day and the number of field observers available.

Number of acute inpatient beds at the hospital	Required number of HH audits per year	Required number of wards per HH audit *	Required number of HH Moments per ward	Total minimum HH Moments for hospital per audit
>400	3	7	350	2450
301-400	3	6	350	2100
201-300	3	5	350	1750
101-200	3	4	200	800
51-100	3	2	100	200
25-50	3	1	100	100
< 25	3	1	50	50

### 7.8.2 Further Logistics of HHC Auditing

The HH observer team should remain alert to reliability problems and devise strategies to reduce them. During the first few days of data collection, the HH Program Officer should review data collection forms for consistency and query inconsistencies or illegible recordings. HH observers should discuss and resolve observational process or recording difficulties either with other Gold Standard auditors, or contact the state representative.



### 7.8.3 Documentation of HHC

#### Points to consider:

- Data sheets should be stored in a safe and secure place
- Following each observation session, forms should be secured together and numbered (e.g. “page 1 of 2”)
- A cumulative tally of the number of HH Moments observed should be recorded on the HH Ward Summary Sheet (see [Appendix 12](#)) to ensure that the target number of observations has been achieved - this can be analysed by the HH Program Officer at the end of each day
- Before commencing data entry, each data collection form should be accounted for by cross-checking with the HH Ward Summary Sheet.

## 7.9 Data Entry and Management

All HH compliance data should be recorded for each of the *5 Moments* on the standard HHA paper data collection form (see [Appendix 9](#)) and later entered into the HHA HHC Application on the HHA website for analysis. Alternative data collection methods and forms may be used as long as the data fields are identical to those required by HHA, and these data fields are submitted to HHA in the prescribed format.

- Each session on each wards should be recorded on a new data collection form
- Each session on the wards should be entered as a new session in the HHA HHC Application
- To ensure accuracy of data entry, each session entered should be double checked to verify that the total correct HH actions and total Moments correspond to the data collection form.

## 7.10 Data analysis

To calculate the overall rate of HH compliance for each area, the following data are required:

*Y = total number of Moments observed*

*X = Total number of appropriately performed HH Moments*

*Rate of overall HH compliance =  $X/Y \times 100 = \% \text{ rate of overall HH compliance}$*

If a sub-analysis of only certain specific Moments is required, then a similar calculation is performed, but where:

Y = the number of specified Moments and X = number of appropriately performed HH actions for that particular *Moment*.



## 7.11 Data Validation

### 7.11.1 At the conclusion of the ward audit:

- Check that all demographic fields on each HHA 5 Moments audit sheet are correct and legible
- Check that there is a HCW / Moment / Action (+/- Gloves) in each box, if one item is missing that Moment needs to be crossed out as it is incomplete and it cannot be used
- Add up total number of Moments collected and write the total on the bottom right corner of audit sheet (see [Appendix 9](#))
- Add up number of correct Moments (rub or wash) collected and write on bottom right corner of audit sheet
- Fill in HHA ward summary sheet for each session on each ward ensuring that all fields are filled in (see [Appendix 12](#)).

### 7.11.2 Data Entry

- Check each field as you enter data as mistakes can easily be made and are easier to correct at time of entering data
- Enter data from paper audit sheets as per fields on HHA HHC Application for each session
- Check total number of moments for each session entered into HHCApplication equals numbers recorded on summary sheet.

## 7.12 Reporting Results

Feedback of results to those concerned is a very powerful promotional tool and should firstly address groups with a strong internal identity. A short delay between observation and reporting of results may increase the effect of the feedback given. Continual feedback of unchanging bad results without any intervention should be avoided, as it may lead to loss of interest (1).



### 7.12.1 How to generate reports from the HHC Application (HHCApp)

HH compliance should be reported in a defined manner:

- Overall HH compliance
- Overall HH compliance according to:
  - Each of the 5 Moments
  - HCW type.

The HHA database allows easy calculation of all these rates (at both a ward and hospital level), and reporting of HH compliance according to the above criteria.

For step by step instructions on how to use the HHA HHCApp please refer to the HHA website

[www.hha.org.au/UserFiles/file/HHCApp/HHCAppInstructionsForOrganisationAdministrators2010-05-25.pdf](http://www.hha.org.au/UserFiles/file/HHCApp/HHCAppInstructionsForOrganisationAdministrators2010-05-25.pdf) .

### 7.12.2 Report Submissions to Hand Hygiene Australia

HH compliance data should be submitted to HHA three times per year. The HHA Coordinator for your jurisdiction will be responsible for ensuring you are aware when data is due. The submission dates are also published on the HHA website home page.

### 7.12.3 Using Reports for Further Education about HH Compliance

HH compliance rates are both a useful outcome measure for the HH culture-change program, and a very useful educational tool for HCWs. Reporting results of hand hygiene observation to HCWs is an essential element of multi-modal strategies to improve hand hygiene practices. Early feedback of HH compliance rates to audited HCWs is a crucial and effective component to achieving improvements in HH compliance and to engaging HCWs in effective cultural-change. The HH Program team should oversee such education and feedback.

The overall ward reports should be given to the managers of the wards in a timely manner, with subsequent reporting to all ward staff followed by further training as required from the audits.

The overall hospital reports should be presented to the hospital management at regular intervals, and should become a standard agenda point on hospital meetings.

### 7.12.4 Hospital, State/Territory, National Reporting of Hand Hygiene Compliance

Overall rates of HH compliance (including 95% confidence intervals) will be reported for each healthcare institution, each state/territory and nationally three times per year. All data submitted is analysed by HHA and reported to the ACSQHC, and fed back to each jurisdiction.



### 7.13 Other available audit tools

In the HHA HHC tool neither the duration of the HH action, nor other quality aspects of HH such as the quantity of product used, technique of HH, donning/doffing of gloves, type of gloves used, length of fingernails, or presence of jewellery are assessed. Once the HH program has been well established in your facility these are items you may wish to address whilst conducting the HHC audit, but they will not be reportable to HHA.

HHA has a number of extra audit tools available for each healthcare facility on the HHA website; also see [Appendix 20](#).



## 7.14 Overview of Approaches for Measuring Compliance to HH Guidelines (57)

	Observation	Product Measurement	Surveys
Brief Description	People observe hand hygiene behaviour and record the number of hand hygiene episodes in relation to recommended practices.	Measuring the amounts of liquid soap, alcohol-based hand rub (ABHR), paper towels, and gloves used in a particular over a specified period of time.	<p>Surveying health care workers about their own hand hygiene practices, knowledge, attitudes, and product satisfaction.</p> <p>Surveying patients and families about their attitudes and perceptions of the hand hygiene practices of health care workers.</p>
Strengths	<p>Can pinpoint the hand hygiene behaviour of individuals.<sup>1,2</sup></p> <p>Can assess hand hygiene technique.<sup>1</sup></p> <p>Most reliable method of assessing adherence rates.<sup>2</sup></p>	<p>Allows efficient monitoring of hand hygiene per patient day over time in a given unit.<sup>1</sup></p> <p>Is not subject to selection or recall bias.<sup>1</sup></p> <p>Is less time-consuming and less costly than other methods.<sup>2</sup></p>	<p>Inexpensive.<sup>1</sup></p> <p>Not resource intensive.<sup>2</sup></p> <p>Can provide some information on compliance.<sup>2</sup></p> <p>Focuses health care workers' attention on their own hand hygiene practices.<sup>1</sup></p>
Limitations	<p>Awareness of observation can influence staff behaviour.<sup>1,3</sup></p> <p>Labour intensive and costly.<sup>1,2</sup></p> <p>Requires training.<sup>1-3</sup></p> <p>Captures only a sample of all hand hygiene opportunities.<sup>1</sup></p>	<p>Does not reveal who is performing hand hygiene.<sup>1</sup></p> <p>Does not assess technique.<sup>1,3</sup></p> <p>Does not capture hand hygiene opportunities.<sup>1,3</sup></p> <p>cannot account for spillage, use of product for purposes other than hand hygiene, and 'borrowing' between wards.<sup>3</sup></p> <p>Can be affected by product use by patients and families.<sup>1</sup></p> <p>Can be difficult to correlate with observation.<sup>2</sup></p> <p>Validity has been well-established.<sup>2</sup></p>	<p>Inadequate reliability or validity for self-respect of adherence.<sup>1,2,4</sup></p> <p>Health care workers tend to overestimate compliance.<sup>2</sup></p> <p>Validity depends on the quality of the survey's development and testing.</p>

1. Haas JP, Larson EL. Measurement of compliance with hand hygiene. *J Hosp Infect* 66:6-14, May 2007.
2. World Health Organisation (WHO): WHO Guidelines on Hand Hygiene in Health Care (Advanced Draft): A Summary. Geneva, Switzerland: WHO, 2006.
3. Gould DJ et al. Measuring handwashing performance in health service audits and research studies. *J Hosp Infect* 66:109-115, 2007.
4. Harrington L, et al. Reliability and validity of hand hygiene measures. *J Healthc Qual* 29(4):20-29, 2007.

## Chapter 8

# Hand Hygiene Outcome Measures: Rates of *Staphylococcus aureus* bacteraemia (SAB)

### 8.1 Aim

To accurately assess the rates of SAB within the Australian healthcare system.



## 8.2 Definition of SAB

The NHHI uses the National Hospital Acquired Infection *Staphylococcus aureus* bacteraemia definition which has been endorsed by the Australian Commission on Safety and Quality in Health Care's Inter Jurisdictional Committee in 2009.

The following text is taken from the ACSQHC Data Set Specification document at [www.safetyandquality.gov.au/internet/safety/publishing.nsf/Content/PriorityProgram-03](http://www.safetyandquality.gov.au/internet/safety/publishing.nsf/Content/PriorityProgram-03).



## National definition and calculation of Healthcare Associated *Staphylococcus aureus* bacteraemia

### Patient-episode of *S. aureus* bacteraemia (SAB):

A patient-episode of bacteraemia is defined as a positive blood culture for *Staphylococcus aureus*. For surveillance purposes, only the first isolate per patient is counted, unless at least 14 days has passed without a positive blood culture, after which an additional episode is recorded.

A *Staphylococcus aureus* bacteraemia (SAB) will be considered to be healthcare-associated if:

- the patient's first SAB blood culture was collected more than 48 hours after hospital admission or less than 48 hours after discharge

### OR

- the patient's first SAB blood culture was collected less than or equal to 48 hours after hospital admission and one or more of the following key clinical criteria was met for the patient-episode of SAB.

### Clinical criteria:

- SAB is a complication of the presence of an indwelling medical device (e.g. Intravascular line, haemodialysis vascular access, CSF shunt, urinary catheter)
- SAB occurs within 30 days of a surgical procedure where the SAB is related to the surgical site
- SAB was diagnosed within 48 hours of a related invasive instrumentation or incision
- SAB is associated with neutropenia (Neutrophils:  $<1 \times 10^9/L$ ) contributed to by cytotoxic therapy

### Exclusions

Cases where a known previous positive test has been obtained within the last 14 days are excluded. For example: If a patient has SAB in which 4 sets of blood cultures are positive over the initial 3 days of the patient's admission only one episode of SAB is recorded. If the same patient had a further set of positive blood cultures on day 5 of the same admission, these would not be counted again, but would be considered part of the initial patient-episode. If the same patient had a further positive blood culture 20 days after admission (i.e. greater than 14 days after their last positive on day 5), then this would be considered a second patient-episode of SAB.

### Contamination

A contaminated specimen can produce a false positive in surveillance systems. Contamination of blood cultures is rare in adults (1- 2% of culture positive episodes) and more common in children (5-10%).

If, in the evaluation of a potential event: the clinical picture is unresponsive of infection; repeat blood culture(s) is (are) negative; and no antimicrobial treatment is given, the positive blood culture should be regarded as a contamination and not reported in the surveillance data.

### 8.3 Patient-episode of SAB – How rates will be calculated

The following information will be used to define the monthly rates of *Staphylococcus aureus* bacteraemia (SAB) for each Australian healthcare facility with acute inpatient beds:

#### Numerator

Patient-episodes of SAB (noting the following factors related to each episode):

- Determination of whether the SAB is a healthcare associated infection
- Designation of which healthcare facility the patient was admitted to at the time of the patient-episode of SAB.

#### Denominator

Total patient days (noting the following inclusion):

- Same-day patients.

The recommended denominator for calculating monthly rates of HAI in Australian healthcare facilities is *patient days*. *Patient days* is a national standard, defined in the national health data dictionary and used for national reporting. *Occupied bed days* is a term commonly used by some states to express a similar concept to *patient days*. However, there is no national standard for calculating *occupied bed days*.

*Patient days* are calculated by counting the total patient days of those patients *separated* during the specified period, including those admitted before the specified period. Patient days of those patients admitted during the specified period who did not separate until the following reference period are not counted.

For example, Patient A is admitted on January 20 and discharged February 20. Patient A generates 0 patient days in the hospital's January record, and 31 patient days for February (11 from the January period of the separation, and 20 in February).

The yearly variance between calculations of *patient days* and *occupied bed days* is minimal (less than 1%); however the monthly variation can be quite significant for smaller hospitals. Contract patient days are included in the count of total patient days. If it is a requirement to distinguish contract patient days from other patient days, they can be calculated by using the rules contained in the data element: total contract patient days.

## 8.4 Healthcare associated SAB rates

These will be calculated for each healthcare facility and State/Territory per month as follows:

**Numerator**

Patient episodes of Healthcare associated SAB x 10,000

**Denominator**

Patient days at the healthcare facility

## 8.5 Retrospective Assessment of SAB rates

To provide relevant comparative data regarding SAB rates prior to the commencement of the HH Culture-Change program in January 2009, all hospitals and State/Territories are requested to provide monthly SAB rates (total SABs and MRSA SABs) for the 24 months prior to program commencement (Jan 2007-Dec 2008 inclusive). Where possible, both Separation and OBD denominator data should be supplied.



## Chapter 9

# Other Useful Interventions

### 9.1 Aim

Other infection prevention interventions are available to complement the successful implementation, and sustainability of a HH culture change program.



## 9.2 Cleaning Shared Patient Equipment

All HCWs should be familiar with their hospital's "Cleaning, Disinfection and Sterilisation" policy and the Australian Guidelines for the Prevention and Control of Infection in Healthcare (58).

Any instrument or piece of equipment that is to be reused requires reprocessing—cleaning, disinfection and/or sterilisation. The minimum level of reprocessing required for reusable instruments and equipment depends on the individual situation (i.e. the body site and the nature by which the instrument will be used) (58).

Many common items that are shared between patients are classified as "Non-critical" items, i.e. items which come into contact with intact skin but not mucous membranes (58).

Non-critical items include sphygmomanometers, blood pressure cuffs, patient slides, stethoscopes, commodes, intravenous pumps and ventilators, trolleys, keyboards, ward telephones etc (58).

Non critical items require cleaning in line with manufacturer recommendations and facility protocols. Thorough cleaning with a detergent is sufficient for most non-critical items after each individual use, although either intermediate or low-level disinfection may be appropriate in specific circumstances (58).

Ward staff should be educated on how to clean common items that are shared between patients, and which product to use. Appropriate cleaning product must also be easily accessible.

Standardised auditing of cleaning practices can be difficult. Nevertheless, promoting the cleaning of shared patient equipment and the use of alcohol or detergent impregnated wipes can dramatically reduce the risk of cross-transmission of pathogens (16).

## 9.3 Bare below the elbows

Some Hand Hygiene Culture Change Programs advocate a 'Bare below the Elbows' policy for all HCWs. Whilst there is currently little evidence to promote this as a formal recommendation, WHO do recommend that long sleeves be avoided. Long sleeves have been found to be contaminated with pathogens, and can impede appropriate hand hygiene (1).



## 9.4 Hand Hygiene in Shared Patient Areas

There are many shared patient areas within healthcare facilities e.g. Waiting rooms, or group based therapy. Staff within these areas may move between patients regularly.

If a HCW has contact with patients within a shared area then the principles of the 5 Moments for Hand Hygiene remain.

Personal ABHR packs for staff may be more appropriate in these areas.

If patients are sharing equipment appropriate cleaning protocols should be followed. However, this may not be practicable where equipment is passed between patients quickly e.g. Passing a ball in an exercise class. Ensure that all shared equipment is cleaned between sessions/groups.

Patients should also be instructed to perform hand hygiene on entering and leaving a shared area.



# Glossary

The following terms are referred to throughout this manual:

## Alcohol-based hand rub (ABHR)

An alcohol-containing preparation designed for application to the hands in order to reduce the number of viable organisms with maximum efficacy and speed.

## Alcohol wipes

An alcohol-containing wipe used to clean non-soiled shared patient equipment in between each patient use e.g. BP cuffs.

## Bacteraemia

The presence of bacteria in the blood.

## Body Fluids

Any substance secreted by the body with the exception of sweat.

These include:

Blood, Lochia, Saliva, Secretions from mucous membranes, Pus, Gastric and respiratory secretions, Semen, Tears, Wax, Breast milk, Colostrum, Urine, Faeces, Meconium, Vomitus, Pleural fluid, Cerebrospinal fluid, Ascites fluid, Biliary fluid, Bone Marrow, Pus, Organic body samples – e.g. Biopsy samples, organ and cell samples.

## Body Fluid Exposure Risk

Any situation where contact with body fluids may occur. Such contact may pose a contamination risk to either HCW or the environment.

## Contact

The touching of any patient, their immediate surroundings or performing any procedure.

## Decontaminate hands

Application of either an antimicrobial soap/solution and water or an alcohol-based hand rub product, to the surface of the hands. This process reduces microbial counts on hands.

## Detergent Wipes

A detergent-containing wipe used for cleaning lightly soiled shared patient equipment in between each patient use.



### Emollient / Humectant

Ingredient(s) added to hand hygiene products to moisturise and protect the skin from frequent product use.

### Glove use

Glove use by HCWs is recommended for two main reasons: to prevent micro-organisms which may be infecting, commensally carried, or transiently present on HCW's hands from being transferred to patients and from one patient to another; and to reduce the risk of HCWs acquiring infections from patients (see [Appendix 7](#) for The WHO recommended guidelines).

### Hand Care

Actions to reduce the risk of skin damage or irritation. For example, using a moisturiser regularly throughout the day.

### Hand Hygiene (HH)

A process that reduces the number of micro-organisms on hands. Hand hygiene is a general term applying to the use of soap/solution (non-antimicrobial or antimicrobial) and water or a waterless antimicrobial agent to the surface of the hands (e.g. alcohol-based hand rub).

### Hand Hygiene Action

A Hand Hygiene Action can be undertaken either by rubbing with an ABHR, or hand washing with soap and water.

### Hand Hygiene Compliance (HHC)

Is a measurement of appropriate HH. It is defined when HH is considered necessary and is classified according to one of the "5 Moments".

If the action is performed when there is no indication and it has no impact in terms of preventing microbial transmission, then it is not considered to be an act of HH compliance.

The number of *Moments* constitutes the denominator for assessing HH compliance. The actual HH actions undertaken are compared to the number of *Moments* observed to calculate the rate of HH compliance.

HH non-compliance is defined when there is an indication for HH (i.e. a "Moment") and yet no HH was undertaken.

### Hand Hygiene inter-observer reliability

A measure of the agreement or consistency of ratings between two or more HH observers after observing the HH compliance on a series of subjects (see [Section 7.3.2.5](#)).



## Hand Hygiene Moments

*Moments* are based on those defined by the WHO Guidelines on Hand Hygiene (1). Some minor modifications have been made for Australian healthcare conditions. A *Moment* is when there is a perceived or actual risk of pathogen transmission from one surface to another via the hands. HCWs' hands will come in contact with many different types of surfaces while undertaking a succession of tasks.

The 5 Moments for HH are:

- Moment 1:** Before touching a patient
- Moment 2:** Before a procedure
- Moment 3:** After a procedure or body fluid exposure risk
- Moment 4:** After touching a patient
- Moment 5:** After touching a patient's surroundings

## Hand Hygiene Opportunity

Is a WHO term. In Australia, this term is no longer commonly used; instead the term 'Moment' is used.

## Hand Hygiene Product

Any product used for the purpose of HH, including soap and water

## Hand washing

The application of non-antimicrobial soap and water to the surface of the hands.

## Healthcare-Associated Infections (HCAI)

Infections that originate from, or are related to, a healthcare setting or the delivery of healthcare.

## Healthcare Surroundings

Refers to all regions outside of the Patient zone. This includes the curtains, partitions and doors between separate patient areas.

## Health Care Worker (HCW)

Any employee of a healthcare institution who has patient care responsibilities and / or contact with a patient, or a patient's surroundings (see Contact).

## Hospital-associated infections (HAI)

An infection that was not present or incubating prior to the patient being admitted to the hospital, but occurred > 48 hours after admittance to the hospital. HAI's are also termed nosocomial infections.



**Immunocompromised**

Having an immune system that has been impaired by disease or treatment

**Inter-rater (or Observer) Reliability**

A measure of agreement or consistency of ratings by two or more observers on a series of subjects.

**Intra-rater Reliability**

A measure of agreement or consistency of two or more ratings by a single observer on a series of subjects.

**Invasive Medical Device**

Any piece of equipment that enters a patient's skin or body cavity. This encompasses the entire device (e.g. IV line, IV pump and IV pole).

**Methicillin-resistant *Staphylococcus aureus* (MRSA)**

*Staphylococcus aureus* that is resistant to methicillin/flucloxacillin. Commonly referred to as "golden staph".

**Methicillin-susceptible *Staphylococcus aureus***

*Staphylococcus aureus* that is susceptible to methicillin/flucloxacillin.

**Occupational Health and Safety (OH&S)**

Is an area concerned with protecting the safety, health and welfare of people engaged in work or employment. The goal of all occupational safety and health programs is to foster a safe work environment.

**Occupied Bed Days (OBDs)**

Is the sum of the number of occupied beds for each day of the specified period.

**Outcome Measure**

A feature used to describe the effects of care on the health status of patients and populations (e.g. infection rate).

**Patient**

Refers to any part of the patient, their clothes, or any medical device that is connected to the patient.



### Patient contact or direct patient contact

This involves touching the patient, and their immediate surroundings or performing any procedure on the patient.

### Patient Immediate Surroundings

The Patient Surroundings is the space temporarily dedicated to an individual patient for that patient's stay. This includes furniture, medical equipment, medical charts and personal belongings that are touched by the patient and HCWs while caring for that patient.

### Patient Zone

Includes the Patient and the Patient Immediate Surroundings.

### Point of Care

The place where three elements come together: the patient, the HCW, and the care or treatment involving contact with the patient or his/her surroundings. A hand hygiene product should be easily accessible and as close as possible – within arms reach of where patient care or treatment is taking place. Point of care products should be accessible without having to leave the patient zone.

### Procedure

Is an act of care for a patient where there is a risk of direct introduction of a pathogen into the patient's body.

### Process Measure

An index of the degree to which a service or procedure is performed correctly and appropriately, e.g. timing of surgical antibiotic prophylaxis, measuring how many times staff wash their hands.

### Recommendation

A guideline; sample suggestion; to advise.

### Reliability

The extent to which a measurement is consistent and free from error.

### SAB

*Staphylococcus aureus* bacteraemia

### Separations

A separation from a healthcare facility occurs anytime a patient leaves due to discharge, death, or transfer



**Sterile task**

A task performed in such a way as to avoid microbial contamination or inoculation.

**Structured observation**

A method to quantify HCW behaviour using a format that is structured in a manner that is likely to avoid bias and improve consistency. Structured observations provide information on what people actually do, rather than on what they say they do or did. They also provide information on the associated activities and behaviours that precede and follow HH compliance.

**Surgical Hand Hygiene/ surgical hand preparation**

Antiseptic handwash or antiseptic handrub performed preoperatively by the surgical team to eliminate transient flora and reduce resident skin flora. Such antiseptics often have persistent antimicrobial activity.

ABHRs for surgical procedures are not addressed within the scope of the HHA agenda. Please refer to the WHO Guidelines on Hand Hygiene in Health Care (1) for further information.

**Validity**

Refers to the accuracy of a measure. It is the extent to which a measuring instrument actually measures what it is supposed to measure.

**WHO**

The World Health Organisation



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# Appendices

## Introduction of a Hand Hygiene Culture Change Program

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2. [HHA Toolkit of resources](#)
3. [Frequently Asked Questions](#)
4. [HHA 5 Moments for Hand Hygiene Posters](#)

## WHO Documents

5. [WHO How to Hand Rub Poster](#)
6. [WHO How to Hand Wash Poster](#)
7. [WHO Glove Use Recommendation](#)

## HHA Recommendations

8. [HHA Recommendations for the Placement of ABHR in Public Areas of Health Care Facilities](#)

## HHA Tools

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14. [Detailed Examples of the 5 Moments for HH](#)
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## Sample Policies

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19. [Skin Care Questionnaire](#)
20. [Ward / Department Product Auditing Form](#)
21. [HHA OH&S Risk Assessment](#)

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