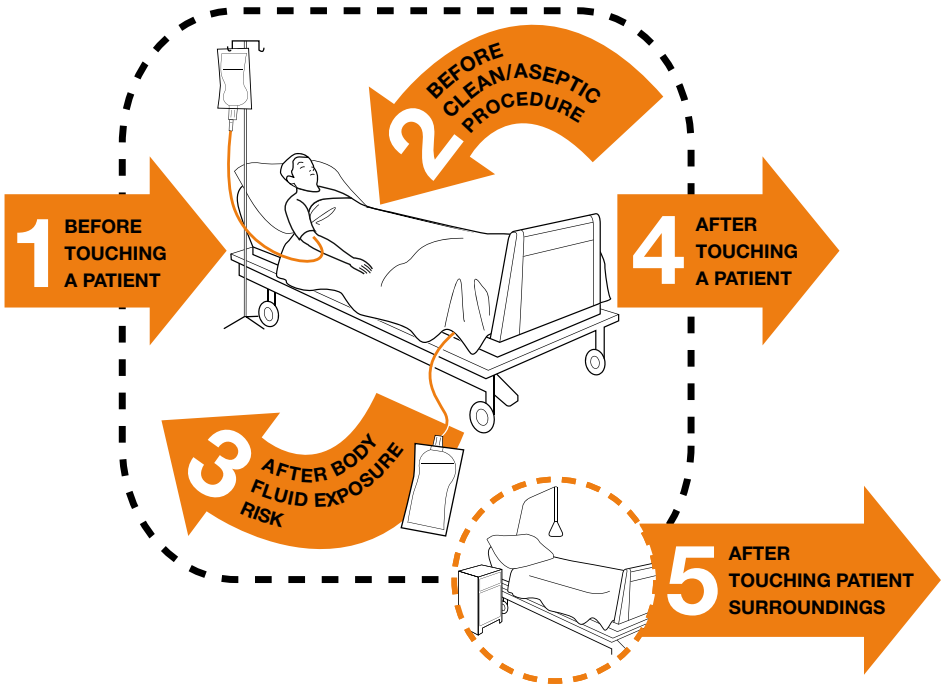
SAVE LIVES
Clean Your Hands

Hand Hygiene Technical Reference Manual

To be used by health-care workers,
trainers and observers of hand hygiene practices



World Health Organization

Patient Safety
A World Alliance for Safer Health Care

WHO Library Cataloguing-in-Publication Data

Hand hygiene technical reference manual: to be used by health-care workers, trainers and observers of hand hygiene practices.

1.Hand wash - standards. 2.Hygiene. 3.Cross infection - prevention and control. 4.Patient care - standards. 5.Manuals. I.World Health Organization. II.WHO Patient Safety.

ISBN 978 92 4 159860 6 (NLM classification: WB 300)

Printed in

SAVE LIVES
Clean **Your** Hands

Hand Hygiene Technical Reference Manual

To be used by health-care workers,
trainers and observers of hand hygiene practices

World Health Organization

Patient Safety
A World Alliance for Safer Health Care

CONTENTS

DEFINITION OF TERMS

Alcohol-based (hand) rub.
An alcohol-containing preparation (liquid, gel or foam) designed for application to the hands to inactivate microorganisms and/or temporarily suppress their growth. Such preparations may contain one or more types of alcohol, other active ingredients with excipients, and humectants.

Clean/aseptic procedure
Any care activity that implies a direct or indirect contact with a mucous membrane, non-intact skin or an invasive medial device. During such a procedure no germ should be transmitted.

Body fluids
Any substance/fluid from the body:
- blood
- excreted: urine, stools, vomit, meconium, lochia
- secreted: saliva, mucous, sperm, milk and colostrum, tears, wax, caseosa (until first bath)
- trans-/ex-sudate: pleural fluid, cerebrospinal fluid, ascites fluid, synovial fluid, amniotic fluid, pus, with the exception of sweat
- by extension, any biological samples taken from the body (including tissue sample, placenta, cytological sample, organ, bone marrow)

Critical site
Critical sites are associated with the risk of infection. They either correspond to body sites or to medical devices that have to be protected against harmful germs (called critical sites with infectious risk for the patient), or body sites or medical devices that potentially lead to hand exposure to body fluids and blood borne pathogens (called critical sites with body fluid exposure risk). Both pre-cited risks can occur simultaneously.

Medical gloves
Gloves used for medical procedures:
- sterile and non-sterile examination gloves
- surgical gloves
- chemotherapy gloves

Hand care
Actions to reduce the risk of skin damage or irritation.

Hand hygiene
A general term referring to any action of hand cleansing. Hand-rubbing with an alcohol-based handrub or handwashing with soap and water aimed at reducing or inhibiting the growth of micro-organisms on hands.

Hand hygiene indication
Reason for a hand hygiene action.

Hand hygiene opportunity
Moment during health-care activities when hand hygiene is necessary to interrupt germ transmission by hands. It constitutes the denominator for calculating hand hygiene compliance, i.e. the proportion of times that HCWs perform hand hygiene of all observed moments when this was required.

Handrubbing
Applying an antiseptic handrub to reduce or inhibit the growth of microorganisms without the need for an exogenous source of water and requiring no rinsing or drying with towels or other devices.

Invasive medical device
A medical device inserted either through the skin or a mucous membrane or through a natural orifice.

Colonization
The presence and multiplication of microorganisms without tissue invasion or damage.

Infection
Invasion by and multiplication of pathogenic microorganisms in a bodily part or tissue, which may produce subsequent tissue injury and progress to overt disease through a variety of cellular or toxic mechanisms.

OVERVIEW

Health care-associated infection (HCAI) places a serious disease burden and has a significant economic impact on patients and health-care systems throughout the world. Yet good hand hygiene, the simple task of cleaning hands at the right time and in the right way, can save lives.

The World Health Organization (WHO) has developed evidence-based WHO Guidelines on Hand Hygiene in Health Care to support health-care facilities to improve hand hygiene and thus reduce HCAI.

The Hand Hygiene Technical Reference Manual has been developed to assist health-care workers to implement improvements in their facility as part of a multi-modal strategy and in accordance with the WHO Guidelines on Hand Hygiene in Health Care.

This Technical Reference Manual is designed for use in any health-care facility. It describes detailed hand hygiene information and is aimed at health-care workers, trainers and observers. It focuses on understanding, practising and teaching hand hygiene concepts, with the aim of helping others to understand its importance and application in the prevention of micro-organism cross-transmission. It is particularly important as it provides comprehensive information on the application of WHO's "My 5 Moments for Hand Hygiene" approach and the practice of hand hygiene observation, as well as providing practical examples and visuals. Thus, it facilitates increased knowledge on both when and how health-care workers should perform, as well as observe, hand hygiene. It can be used to facilitate formal and informal training and education sessions and helps to support the process of evaluation and feedback in relation to hand hygiene observations. The ultimate goal is to support the reduction in acquisition of HCAI by improving hand hygiene practices and thus prevent the wasting of resources, and, save lives.

PART I
HEALTH CARE-ASSOCIATED INFECTION AND HAND HYGIENE

I.1 WHAT IS A HEALTH CARE-ASSOCIATED INFECTION AND WHAT IS ITS IMPACT ON PATIENT SAFETY?

Health care-associated infection (HCAI) – also referred to as nosocomial infection – is defined as "an infection occurring in a patient during the process of care in a hospital or other health-care facility that was not present or incubating at the time of admission. This also includes infections acquired in the hospital but appearing after discharge, and occupational infections among staff of the facility". From the definition it is clearly understandable that the occurrence of this infection is linked to health-care delivery and that it may result, although not always, as a consequence of the failure of health-care systems and processes as well as of human behaviour. Therefore, it represents a significant patient safety problem.

HCAI occurs worldwide and affects hundreds of millions of patients both in developed and developing countries. In developed countries it complicates between 5-10% of admissions in acute care hospitals. In developing countries the risk is two-to-20 times higher and the proportion of infected patients can exceed 25%. Beyond causing physical and moral suffering to patients and their relatives, HCAIs represent a high cost to the health system and consume resources that could be spent on preventive measures or other priorities.

I.2 WHAT IS THE ROLE OF HANDS IN GERM TRANSMISSION?

Microorganisms (germs) responsible for HCAI can be viruses, fungi, parasites and, more frequently, bacteria. HCAI can be caused either by micro-organisms already present on the patient's skin and mucosa (endogenous) or by micro-organisms transmitted from another patient or health-care worker or from the surrounding environment (exogenous). In most cases, health-care workers' hands are the vehicle for transmission of microorganisms from the source to the patient but patients themselves may also be the source. Generally, microorganisms are transmitted from one patient to another, from one body site to another and from the environment to the patient or vice versa. Health-care workers' hands can become progressively colonized by germs and potential pathogens during patient care. In the absence of hand hygiene, the longer the duration of care, the higher the degree of hand contamination and potential risks to patient safety.

The risk of transmission and potential harm applies at any time during health-care delivery, especially to immuno-compromised or vulnerable patients and/or in the presence of indwelling invasive devices (such as urinary catheter, intra-venous catheter, endotracheal tube, drains).

I.3 WHAT ROLE DOES HAND HYGIENE PLAY IN THE PREVENTION OF HCAI?

Several studies have clearly demonstrated that the implementation of well-structured infection control programmes is a cost-effective way to reduce HCAI. Some have shown that these results are also achievable in countries and health-care facilities with limited resources.

The foundations of infection control are built on a number of simple, well-established precautions proven to be effective and widely appreciated. "Standard Precautions" encompass the basic principles of infection control that are mandatory in all health-care facilities. Their application extends to every patient receiving care, regardless of their diagnosis, risk factors and presumed infectious status, reducing the risk to patient and staff of acquiring an infection.

Hand hygiene is very much at the core of Standard Precautions and is the undisputed single most effective infection control measure. This also includes circumstances where specific, targeted "isolation precautions" (namely contact, droplet and airborne precautions) are applied. Furthermore, its importance is emphasized in the most modern "bundle" or multimodal quality improvement approaches for the prevention of specific site infections such as device-related bloodstream and urinary tract infections, surgical site infection, and ventilator-associated pneumonia. The importance of embedding efficient and effective hand hygiene into all elements of care delivery must be kept prominent within health care.

I.4 HOW TO PRACTISE HAND HYGIENE?

Hand hygiene may be practised by rubbing hands with an alcohol-based handrub or by washing with soap and water. The technique for doing this, as well as the product used, render hands free from potentially harmful contamination and make them safe for patient care.

Handrubbing with an alcohol-based formulation

The most effective way to ensure optimal hand hygiene is by using an alcohol-based handrub. According to the *WHO Guidelines on Hand Hygiene in Health Care*, when an alcohol-based handrub is available, it should be used as the preferred means for routine hand antisepsis (recommendation IB). Alcohol-based handrubs have the following immediate advantages:

- elimination of the majority of germs (including viruses);
- the short time required (20 to 30 seconds);
- availability of the product at the point of care*;
- good skin tolerability;
- no need for any particular infrastructure (clean water supply network, washbasin, soap, hand towel).

Soap and alcohol-based handrub should not be used concomitantly (recommendation II).

To comply with routine hand hygiene recommendations, health-care workers should ideally perform hand hygiene where and when care is provided, which means at the point of care* and at the moments indicated. This often calls for the use of an alcohol-based product.

Hand washing

Hands need to be washed with soap and water when they are visibly dirty or soiled with blood or other body fluids, when exposure to potential spore-forming organisms is strongly suspected or proven, or after using the lavatory (recommendation II).

The process of performing effective hand hygiene, whether rubbing with an alcohol-based handrub or hand washing (Figures 1.a and 1.b), is dependent on a number of factors:

- the quality of the alcohol-based product (conformity with European and US standards)
- the amount of product used
- the time spent rubbing or washing
- the hand surface rubbed or washed.

Hand hygiene actions are more effective when hand skin is free of cuts, nails are natural, short and unvarnished, and hands and forearms are free of jewellery and left uncovered (see Section 4, Other aspects of hand hygiene).

It is therefore important that a number of steps are taken in the process of performing hand hygiene to render hands safe for providing care (Figures 1.a and 1.b).

Figure 1.a

I.5 WHEN TO PERFORM HAND HYGIENE?

Compliance or non-compliance with hand hygiene has consequences for the transmission of pathogens and the development of HCAIs. Hand hygiene is not just an option, a matter of common sense or merely an opportunity; it corresponds to indications during care delivery that are justified by the risk of germ transmission. To minimize differences in the way they are understood and applied by health-care workers, trainers and observers of hand hygiene practices it is important that hand hygiene indications become universally understandable. There should be no room for doubt or interpretation by health-care workers and, additionally, if hand hygiene practices are to be evaluated and fed back to ensure sustained improvement, it is essential that observers have a clear understanding of the right indications for hand hygiene.

*__Point of care__ - the place where three elements come together: the patient, the health-care worker and care or treatment involving contact with the patient or his/her surroundings (within the patient zone). The concept embraces the need to perform hand hygiene at recommended moments exactly where care delivery takes place. This requires that a hand hygiene product (e.g. alcohol-based handrub, if available) be easily accessible and as close as possible – within arm's reach of where patient care or treatment is taking place. Point-of-care products should be accessible without having to leave the patient zone.

Availability of alcohol-based handrubs at point of care is usually achieved through staff-carried handrubs (pocket bottles), handrubs fixed to the patient's bed or bedside table or handrubs affixed to dressing or medicine trolleys that are taken to the point of care.

Figure 1.b

Figure 2.

I.5.1 The concept of "My five moments for hand hygiene"

The "My five moments for hand hygiene" concept proposes a unified vision for health-care workers, trainers and observers to minimize inter-individual variation and lead to a global increase in adherence to effective hand hygiene practices. Considering the evidence, this concept merges the hand hygiene indications recommended by the WHO Guidelines on Hand Hygiene in Health Care (see Part II of the Guidelines) into five moments when hand hygiene is required. Importantly, this user- and patient-centred approach aims for minimal complexity and a harmonious integration into the natural workflow, which applies across a wide range of care settings and health-care professions.

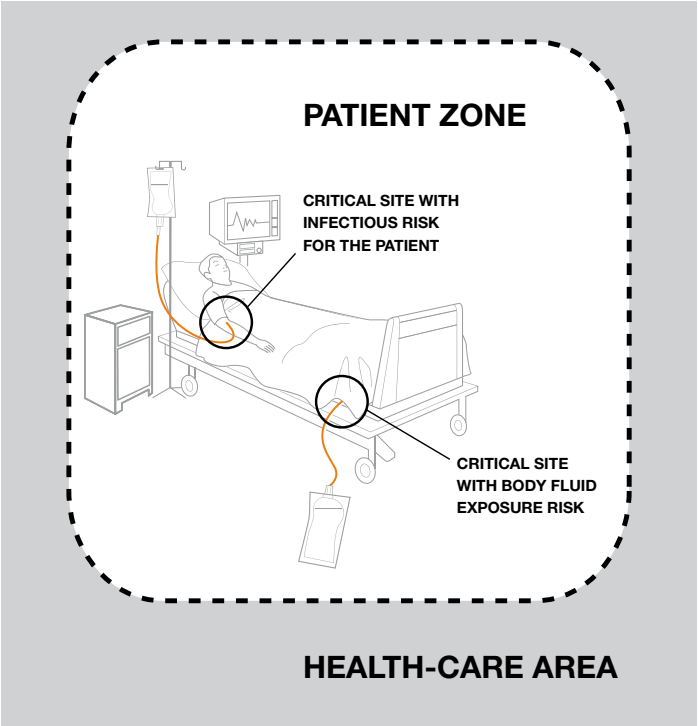
The decision to address hand hygiene via a synthetic concept focusing on only five indications is intended to make it easier to understand the moments when there is a risk of germ transmission via the hands, to memorize them and to assimilate them into health-care activities. The "My five moments for hand hygiene" (Figure 2) is proposed as the reference approach for the appropriate performance, teaching and evaluation of hand hygiene. The concept attempts to go beyond the long list (never exhaustive) of health-care actions and situations requiring hand hygiene; it does not define specific and multiple procedures and care situations but it helps focus on essential moments embedded within the care sequence that are essential for hand hygiene. The concept does not in any way reduce the need for hand hygiene. It is a tool to identify moments when hand hygiene must be performed, as well as to distinguish those when it is not useful.

PART II
PRACTISING, TEACHING AND OBSERVING HAND HYGIENE

II.1 APPLYING THE "MY FIVE MOMENTS FOR HAND HYGIENE" IN PRACTICE

The need for hand hygiene is closely connected with the activities of health-care workers within the geographical area surrounding each patient. Focusing on a single patient, the health-care environment can be divided into two virtual geographical areas, the *patient zone* and the *health-care area*, as illustrated in Figure 3.

Figure 3.



II.1.1 The patient zone

The "My five moments for hand hygiene" are particularly focused on the contacts occurring within the patient zone during health-care delivery in this area.
The *patient zone* includes the patient and some surfaces and items that are **temporarily** and **exclusively** dedicated to him or her. It contains the patient X and his/her immediate surroundings (Figure 3). This typically includes the patient and all inanimate surfaces that are touched by or in direct physical contact with the patient such as the bed rails, bedside table, bed linen, infusion tubing and other medical equipment. It further contains surfaces frequently touched by health-care workers while caring for the patient, such as monitors, knobs and buttons, and other touch surfaces.

The patient's zone is not a static geographical area (e.g. the area around the patient including his bed and associated furniture and equipment), but the area surrounding the patient and including him/her at any point in time. It "accompanies" the patient in the health-care area, wherever he/she stays and goes. The model is not limited to a bedridden patient, but applies equally to patients sitting in a chair or being received by physiotherapists in a common treatment location (Figure 4). As a consequence the concept of "My five moments" applies also to situations that define a "temporary" patient zone (e.g. while assisting the patient at the toilet). The patient zone may also vary considerably according to the setting, the length of stay, the type of delivered care.

Figure 4.

Patient surroundings are contaminated by the patient's own flora. Therefore, any item designed for reuse, should be previously decontaminated when entering and leaving the patient surroundings. Any item not usually dedicated to patient care and frequently moved to the health-care area should never be considered as patient surroundings, regardless of their proximity to the patient (e.g. the computerized or paper chart, pencils, etc). Personal belongings are considered part of patient zone since they should not be taken out of it. In addition items and surfaces temporarily exposed to the patient, such as surfaces of a shared bathroom, a table of physiotherapy or radiology should be decontaminated after the patient has left.

II.1.2 The health-care area

The *health-care area* corresponds to all surfaces in the health-care setting outside the patient zone of patient X, i.e. other patients and their patient zones and the wider health-care environment. In most settings the health-care area is characterized by the presence of various and

numerous microorganisms, including multi-resistant germs. Performing hand hygiene by applying the five moments for hand hygiene while caring for patients in their patient zone helps to protect the wider health-care environment from contamination by patients' germs.

II.1.3 Contact with a patient and with his/her surroundings

The patient is a person receiving health care involving direct and indirect (via an intermediate object) contact.

The different types of contact are:

a) contact with patient's intact skin and personal effects;
b) contact with mucous membranes, non-intact skin, an invasive medical device that corresponds to a *critical site* as far as the *risk for the patient* is concerned (e.g. a vascular access as shown in Figure 3);
c) potential or actual contact with a body fluid that corresponds to a *critical site* as far as the *risk for the heath-care worker* is concerned (e.g. a urine bag as shown in Figure 3), including contact with mucous membrane and non-intact skin (critical sites at risk for exposure to body fluids); and
d) contact with objects in the patient surroundings.

Each type of contact justifies the need for one or more hand hygiene indications, preceding and following a procedure in order to prevent transmission either to the patient, to the health-care worker or to the health-care area.

II.2 THE HEALTH-CARE PROFESSIONALS CONCERNED BY HAND HYGIENE

All health-care professionals who are in direct and indirect contact with patients and their surroundings during their respective activities are concerned with hand hygiene. The modes of germ transmission may differ depending on the activity, but the entity of the risk associated with transmission in a particular situation is usually unknown. For this reason, all persons involved in health-care delivery are responsible for halting microbial transmission when direct or indirect contact justifies the indications for hand hygiene. In a care environment, all activities involving direct or indirect contact with patients are considered to be health-care activities. This means that, apart from administrative staff, all health professionals, regardless of the setting, are potentially concerned with hand hygiene during the course of carrying out their duties.

II.3 HEALTH-CARE ACTIVITIES AND INDICATIONS

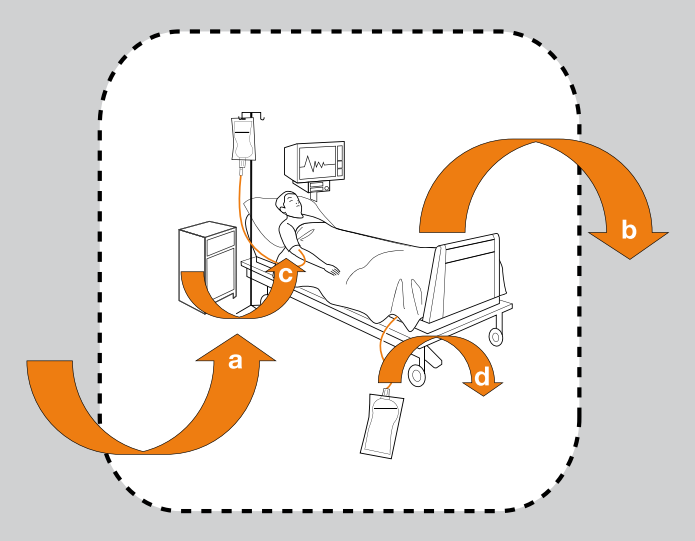
Health-care activity may be described as a succession of tasks during which health-care workers' hands touch different types of surface (patient's hands, mucous membrane, intravenous catheter, bedside table, medical instrument, waste, food, urine). Germ transmission from one surface to another must be interrupted, as each contact may be a potential source of contamination by or to a health-care worker's hands. Whenever there is a risk of germ transmission, the indications apply during the time window between contacts.

... ➡ CONTACT 1 ➡ [INDICATION(S)] ➡ CONTACT 2 ➡ [INDICATION(S)] ➡ ...

The aim of the indications for hand hygiene are:
1) to interrupt the transmission of germs via the hands (Figure 5): a) between the health-care area and the patient zone; b) between the patient zone and the health-care area; c) to a critical site with infectious risk for the patient (e.g. a mucous membrane, non-intact skin, an invasive medical device); d) from blood and body fluids.

2) to prevent: a) colonization of the patient by potential (including multi-resistant) pathogens; b) dissemination of potential (including multi-resistant) pathogens in the health-care area; c) infections caused mainly by endogenous micro-organisms; d) colonization and infection of health-care workers.

Figure 5. Health-care area and patient zone: dynamics of germ transmission



II.4 HAND HYGIENE INDICATIONS AND HAND HYGIENE ACTIONS

The performance of effective hand hygiene involves awareness by health-care workers of the indications and of when and in what order they apply during health-care activities. The hand hygiene action can be performed either by handrubbing with an alcohol-based product or by hand washing with soap and water.

An indication makes hand hygiene necessary at a given moment. It is justified by a risk of germ transmission from one surface to another and each indication is restricted to a specific contact. The indications described here apply to routine care only and not to procedures requiring surgical hand preparation.

The indications for hand hygiene do not correspond to the beginning and end of a sequence of health-care activities. There is an indication for hand hygiene whenever a health-care worker's hands move from one geographical area to another (from the health-care area to the patient zone and vice versa), from one critical site to another body site on the same patient (for example, from a critical site with body fluid exposure risk to a simple contact with the patient), or away from the patient (for example, from the health-care area to a critical site for the patient).

According to the WHO "My five moments for hand hygiene" approach, the hand hygiene indications recommended by the WHO Guidelines on Hand Hygiene in Health Care merge in five essential moments when hand hygiene is needed within the health-care flow (see table below).

Table. Correspondence between the indications and the WHO recommendations

The 5 Moments	Consensus recommendations *WHO Guidelines on Hand Hygiene in Health Care 2009*
1. Before touching a patient	D.a) before and after touching the patient (IB)
2. Before clean/aseptic procedure	D.b) before handling an invasive device for patient care, regardless of whether or not gloves are used (IB) D.d) if moving from a contaminated body site to another body site during care of the same patient (IB)
3. After body fluid exposure risk	D.c) after contact with body fluids or excretions, mucous membrane, non-intact skin or wound dressing (IA) D.d) if moving from a contaminated body site to another body site during care of the same patient (IB) D.f) after removing sterile (II) or non-sterile gloves (IB)
4. After touching a patient	D.a) before and after touching the patient (IB) D.f) after removing sterile (II) or non-sterile gloves (IB)
5. After touching patient surroundings	D.e) after contact with inanimate surfaces and objects (including medical equipment) in the immediate vicinity of the patient (IB) D.f) after removing sterile gloves (II) or non-sterile gloves (IB)

The concept attempts to go beyond the long list (never exhaustive) of health-care actions and situations requiring hand hygiene; it does not define specific and multiple procedures and care situations but rather helps focus on essential moments embedded within the care sequence that are essential for hand hygiene. The concept does not in any way reduce the need for hand hygiene. It is a tool to identify moments when hand hygiene must be performed as well as to distinguish those when it is not useful.

II.5 UNDERSTANDING MORE ABOUT APPLYING THE FIVE MOMENTS

Two of the five moments for hand hygiene occur **before** contact or health-care procedure; the other three occur **after** contact or exposure to body fluids. Indications corresponding to the "before" moments indicate the need to prevent the risk of microbial transmission to the *patient*. The "after" indications are intended to prevent the risk of microbial transmission to the *health-care worker* and the *health-care area* (i.e. other patients, their surroundings and the health-care environment). During a sequence of health-care activities, certain indications may coincide at the same moment. If, as a result, only one hand hygiene action is required, the indications must be individually assessed in the light of the expected outcome.

II.5.1 Indication (moment) 1: Before touching a patient

When: before touching a patient when approaching him/her. This indication is determined by the occurrence of the last contact with the health-care area and the next contact with the patient.

Why: to prevent germ transmission from the health-care area to the patient and ultimately to protect the patient against colonization and, in some cases, against exogenous infection by harmful germs carried on health-care workers' hands.

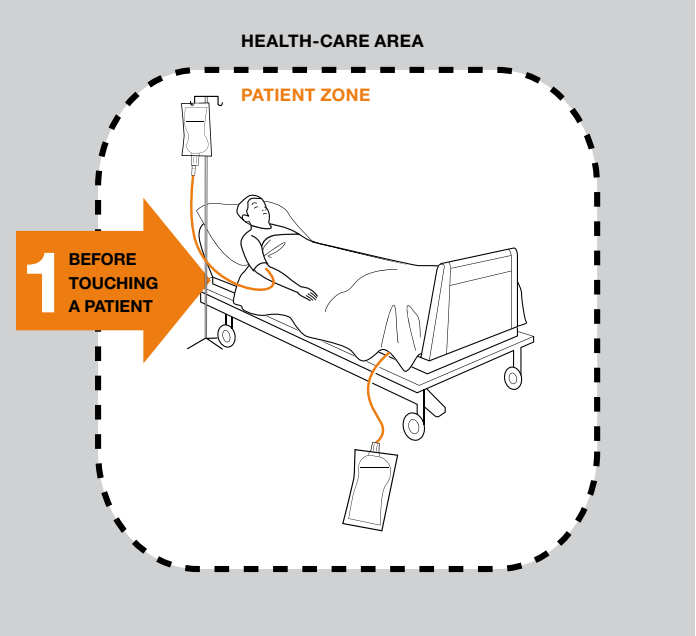
Notes: This moment occurs before contact with the patient's intact skin and clothing; the hand hygiene action can be performed either while entering the patient zone, when approaching the patient, or immediately before touching him/her. Contact with surfaces in patient surroundings may occur by touching items between the time of entering the patient zone and the contact with the patient; hand hygiene is not required before touching these surfaces but before contact with the patient. If, following hand hygiene but before an "initial" contact with the patient, other contacts of the same kind or with patient surroundings occur, then hand hygiene does not need to be repeated.

Situations illustrating direct contact:
a) before shaking hands with a patient, stroking a child's forehead;
b) before assisting a patient in personal care activities: to move, to take a bath, to eat, to get dressed, etc;
c) before delivering care and other non-invasive treatment: applying oxygen mask, giving physiotherapy;
c) before performing a physical, non-invasive examination: taking pulse, blood pressure, chest auscultation, recording ECG.

Practical example:

Contact with the health-care area prior to indication	Indication 1 Before touching a patient	Contact with the patient that justifies the indication 1
Health-care worker enters a shared room, pushing a file trolley and draws back one patient's cubicle curtains.	The health-care worker performs hand hygiene.	The health-care worker moves the bedside table to reach the patient and shakes his/her hand or The health-care worker shakes the patient's hand and moves the bedside table.

Figure 6.a



II.5.2 Indication (moment) 2: Before clean/aseptic procedure (on a critical site with infectious risk for the patient)

When: immediately before accessing a critical site with infectious risk for the patient. This indication is determined by the occurrence of the last contact with any surface in the health-care area and in the patient zone (including the patient and his/her surroundings), and any procedure involving any direct and indirect contact with mucous membranes, non-intact skin or an invasive medical device.

Why: to prevent germ transmission to the patient and from one body site to another in the same patient through inoculation.

Notes:
If gloves are used to perform the clean/aseptic procedure, hand hygiene must be performed before they are donned.
The indication is not defined by a sequence of health-care actions but instead by direct or indirect contact with mucous membrane, damaged skin or an invasive medical device.

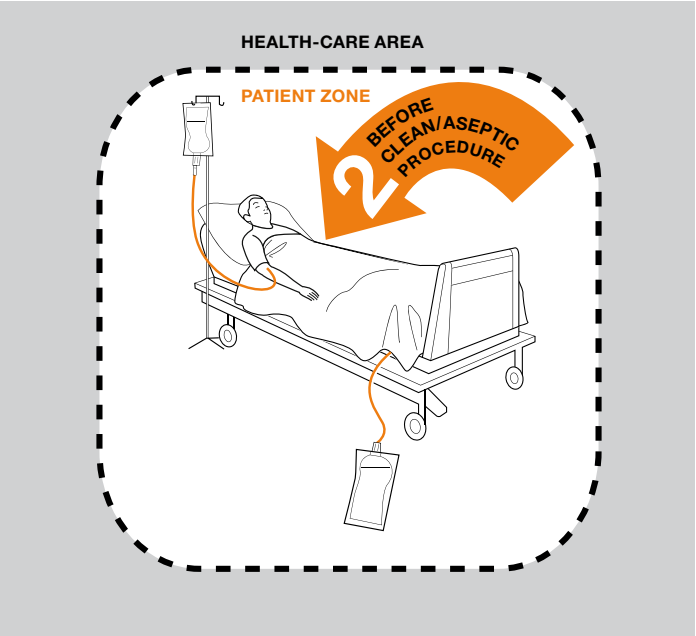
Any health-care worker operating "upstream" from actual direct care and preparing an item meant to be in contact with mucous membranes or non-intact skin through ingestion or inoculation (sterilization worker, pharmacist, cook) must also consider this indication.

Situations illustrating clean/aseptic procedures:
a) before brushing the patient's teeth, instilling eye drops, performing a digital vaginal or rectal examination, examining mouth, nose, ear with or without instrument, inserting suppository/pessary, suctioning mucous;
b) before dressing a wound with or without instrument, applying ointment on vesicle, performing a percutaneous injection/ puncture;
c) before inserting an invasive medical device (nasal cannula, nasogastric tube, endotracheal tube, urinary probe, percutaneous catheter, drainage), disrupting/opening any circuit of an invasive medical device (for food, medication, draining, suctioning, monitoring purposes);
d) before preparing food, medications, pharmaceutical products, sterile material.

Practical example:

Contact with a surface prior to indication	Indication 2 Before clean/ aseptic procedure	Contact with non-intact skin that justifies the indication 2
The health-care worker has made the necessary preparations for taking a blood sample, including disinfecting and applying a tourniquet to the patient's arm.	The health-care worker performs hand hygiene.	The health-care worker puts on gloves and inserts the needle in the vein.

Figure 6.b



II.5.3 Indication (moment) 3: After body fluid exposure risk

When: as soon as the task involving exposure risk to body fluids has ended (and after glove removal). This indication is determined by the occurrence of contact (even if minimal and not clearly visible) with blood or another body fluid and the next contact with any surface, including the patient, the patient surroundings or the health-care area.

Why: To protect the health-care worker from colonization or infection with the patient's germs and to protect the health-care environment from germ contamination and potential subsequent spread.

Notes: If the health-care worker is wearing gloves at the time of exposure to a body fluid, they must be removed immediately thereafter and hand hygiene must be performed.
This action may be postponed until the health-care worker has left the patient surroundings if the health-care worker has to remove and process equipment (e.g. an abdominal drainage tube) on appropriate premises, and provided that he or she only touches this equipment before performing hand hygiene.

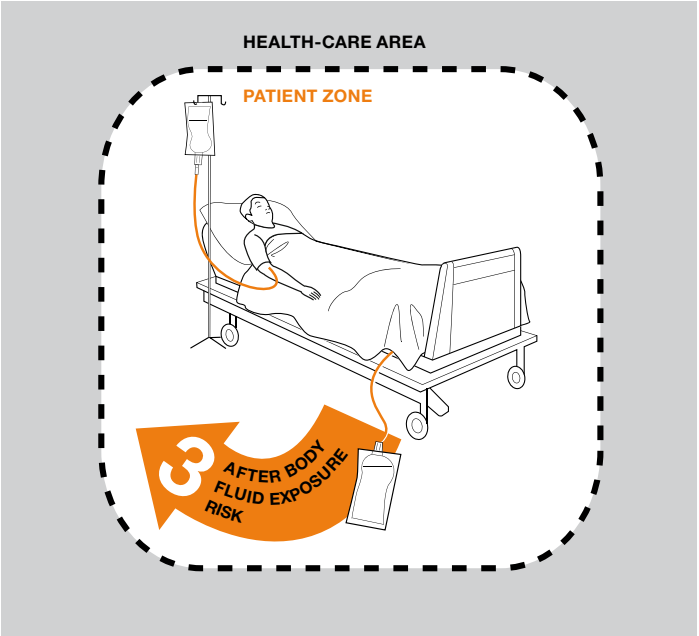
Any health-care worker operating "downstream" from the actual direct patient care and involved in handling body fluids (laboratory technician, pathologist), contaminated and soiled equipment (sterilization worker), contaminated and soiled waste (maintenance or utility worker) must also consider this indication.

Situations illustrating body fluid exposure risk:
a) when the contact with a mucous membrane and/or with non-intact skin ends;
b) after a percutaneous injection or puncture ends; after inserting an invasive medical device (vascular access, catheter, tube, drain, etc); after disrupting and opening an invasive circuit;
c) after removing an invasive medical device;
d) after removing any protection (napkin, dressing, gauze, sanitary towel, etc);
e) after handling an organic sample; after clearing excreta and any other body fluid; after cleaning any contaminated surface and soiled material (soiled bed linen, dentals, instruments, urinal, bedpan, lavatories, etc).

Practical example:

Risk of exposure to a body fluid which justifies indication 3	Indication 3 After exposure risk to body fluid	Contact occurs with the patient, his/her surroundings or care environment following indication
The health-care worker changes soiled sheets and removes a bedpan from a bed-bound patient, places sheets in a bag and removes gloves.	The health-care worker performs hand hygiene.	The health-care worker helps patient back into bed.

Figure 6.c



II.5.4 Indication (moment) 4: After touching a patient

When: when leaving the patient's side, after having touched the patient. This indication is determined by the occurrence of the last contact with intact skin or the patient's clothing or a surface in the patient's surroundings (following contact with the patient), and the next contact with a surface in the health-care area.

Why: to protect the health-care worker from colonization and potential infection by patient germs and to protect the environment in the health-care area from germ contamination and potential spread.

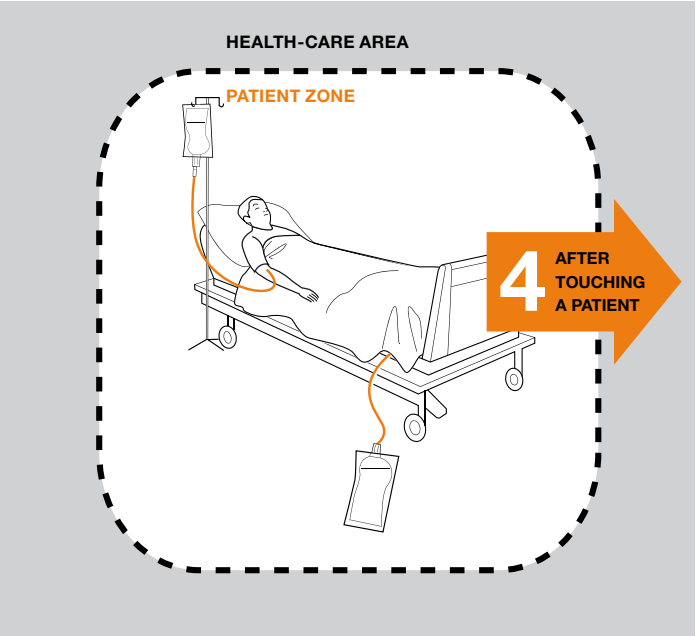
Notes: The action may be postponed until the health-care worker has left the patient zone if the health-care worker has to remove and process equipment on appropriate premises, and provided that he or she touches this equipment only before performing hand hygiene.
Indication 4 cannot be dissociated from indication 1.
When the health-care worker touches the patient directly and then touches another object in the patient surroundings before leaving the zone, indication 4, and not 5, applies.

Situations illustrating direct contact:
a) after shaking hands with a patient, stroking a child's forehead;
b) before assisting a patient in personal care activities: to move, to take a bath, to eat, to get dressed, etc;
c) after performing a physical non-invasive examination: taking pulses, blood pressure, chest auscultation, recording ECG;
c) after applying care and other non-invasive treatment: changing bed linen the patient is in, applying an oxygen mask, giving physiotherapy.

Practical example:

Contact with the patient and/ or his or her surroundings which justifies indication 4	Indication 4 After touching a patient	Contact with environment in the health-care area which follows indication 4
The health-care worker helps the patient to sit back in the bed.	The health-care worker performs the hand hygiene action.	The health-care worker answers the telephone.

Figure 6.d



II.5.5 Indication (moment) 5: After touching patient surroundings

When: after touching any object or furniture when leaving the patient surroundings, without having touched the patient. This indication is determined by the occurrence of the last contact with inert objects and surfaces in the patient surroundings (without having touched the patient) and the next contact with a surface in the health-care area.

Why: To protect the health-care worker against colonization by patient germs that may be present on surfaces/objects in patient surroundings and to protect the health-care environment against germ contamination and potential spread.

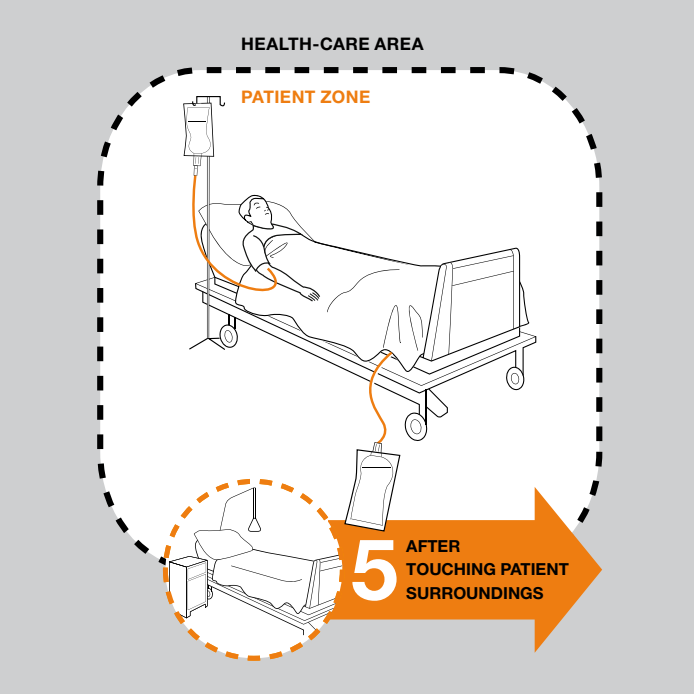
Note: Indication 4, "after touching a patient" and indication 5 "after touching patient surroundings" may never be combined, since indication 5 excludes contact with the patient and indication 4 applies only after patient contact.

Situations illustrating contacts with patient surroundings:
a) after a maintenance activity: changing bed linen with the patient out of the bed, holding a bed rail, clearing a bedside table;
b) after a care activity: adjusting perfusion speed, clearing a monitoring alarm;
c) after other contacts with surfaces or inanimate objects (that should ideally be avoided): leaning against a bed, a night table.

Practical example:

Contact with inert objects and surfaces in patient surroundings which justifies indication 5	Indication 5 After contact with patient's surroundings	Contact with care environment which follows indication 5
The health-care worker has removed the sheets of the unoccupied bed and has discarded them in a bag.	The health-care worker performs hand hygiene.	The health-care worker answers the telephone.

Figure 6.e

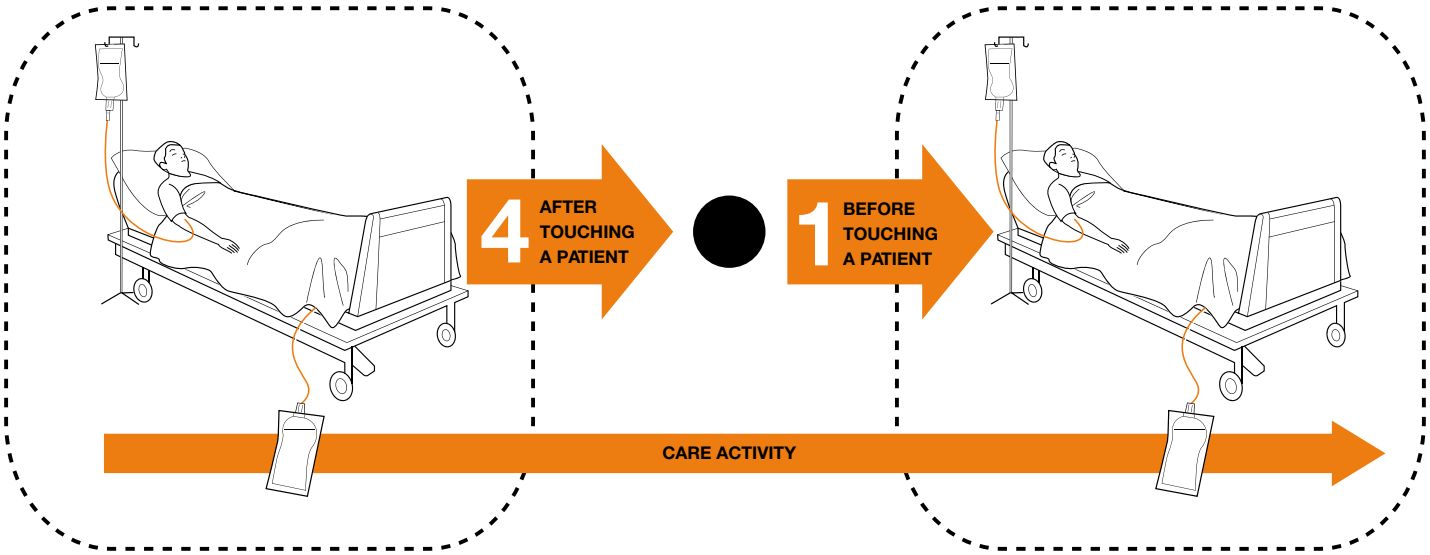


II.5.6 Understanding the five moments within the care sequence

The sequence of health-care actions delivered to a single patient or to several patients can lead to a number of hand hygiene indications occurring simultaneously. This does not mean that each indication requires a separate hand hygiene action. One hand hygiene action is justified by the indication that immediately precedes or follows a sequence of two or more contacts; a single hand hygiene action is enough to prevent all risk of microbial transmission.

Figure 7 illustrates an example of the coincidence of two indications: when a health-care worker moves from one patient to another, which would normally imply different indications depending on the point of view of each patient. Indication 4, in this case “after touching patient A”, applies when he or she leaves patient A to attend to patient B; and indication 1, “before touching patient B”, applies in this case before contact occurs between the health-care worker and patient B. There are a number of other situations where more than one indication coincide. Innumerable combinations are possible for all indications, except for 4 and 5.

Figure 7. Coincidence of two indications



II.6 INDICATIONS FOR HAND HYGIENE WHEN MEDICAL GLOVES ARE REQUIRED

The indications for hand hygiene are independent of those that justify the use of gloves (whether sterile or non-sterile). Glove use neither alters nor replaces the performance of hand hygiene: a) where an indication for hand hygiene precedes a task involving contact that necessitates the use of gloves, hand hygiene must be performed before donning gloves; b) where an indication follows a task involving contact that requires the use of gloves, hand hygiene must be performed after the gloves are removed; c) where an indication occurs while the health-care worker is wearing gloves they must be removed to allow hand hygiene performance and, if necessary, changed. The use of gloves does not determine indications for hand hygiene; rather, hand hygiene influences the appropriate use of gloves.

For extensive information about glove use, refer to the “Glove use information leaflet” included in the Implementation Package of the WHO Multimodal Hand Hygiene Improvement Strategy.

In summary

Hand hygiene indications can be merged into five moments during health-care delivery. Knowing, understanding and recognizing these moments are the pillars on which effective hand hygiene is based. If health-care workers promptly identify these indications (moments) and respond to them by complying with hand hygiene actions, it is possible to prevent health care-associated infections caused by cross-transmission via hands. The right action at the right moment is a guarantee of safe patient care.

PART III
OBSERVING HAND HYGIENE PRACTICES

III.1. THE PURPOSE OF OBSERVATION

The main purpose of observation is to demonstrate the degree of compliance with hand hygiene among health-care workers and, in some cases, to assess the type and quality of the technique used to perform it. Depending on the level of compliance by health-care workers and the type of setting, and in accordance with specific priorities, the results of the observation also help determine the most appropriate interventions for hand hygiene promotion, education and training. Conducting observations before and after such a period of intervention makes it possible not only to evaluate hand-hygiene compliance levels repeatedly but also to measure improvements and the impact of the intervention, and adjust education material and campaigns.

If available, the results of the observation can be correlated with the trends of HCAI rates, the indicator for evaluating the outcome of a hand hygiene promotion strategy.

The main purpose of the WHO method for direct observation proposed here is to produce large-scale data on compliance with hand hygiene in the most accurate way and according to the "My five moments for hand hygiene" approach.

III.2. DIRECT OBSERVATION OF HAND HYGIENE PRACTICES

Direct observation of health-care workers while delivering routine care is one of the methods to evaluate hand hygiene practices. A direct observation method is chosen because it generates the most accurate data on health-care workers' compliance with the recommendations on hand hygiene, although the results should not be regarded as a perfect representation of the actual situation. Its advantages are: a) the real-time denominator allows results simultaneously relating to time, place and circumstances to be compared; and b) consistency between the reference concepts, definitions and tools used by both health-care workers and observers. The two main disadvantages of the method are the potential influence the observer may have on the behaviour of health-care workers (since this method implies that the health-care worker is aware of being observed), and the impact of the observer's interpretation of the definitions and the actual situation on the reliability of the data.

III.3. THE RULES OF OBSERVATION

Usually it is recommended that observation data be collected anonymously and kept confidential. The results of observations should not be employed to carry out administrative evaluation of staff. However in some cases, by institutional decision or because there is no specific obstacle to health-care workers' identification, individual observation including health-care worker identification may be undertaken also for educational purposes. Indeed, to improve understanding of hand hygiene and to contribute to its promotion, wherever possible the results of an observation should be presented immediately to the health-care staff who have been observed (performance feedback). This should be done in a way that allows an exchange of views conducive to fostering a safety culture and trust among those who have taken part.

For example, feedback can be given in meetings or else to individuals at a convenient time during their working day in a simple written format that can be posted in a convenient place in a clinical setting and discussed on an on-going basis and compared to future compliance information. In addition, final results should be sent to all the concerned health-care workers either collectively or individually as well as to others, for example management or infection control committees according to local decisions. This should occur as soon after the data has been collected as possible. Observation is a way of making health-care staff aware of the need to practise hand hygiene: simply observing hand hygiene practices, providing feedback and commenting on the results has an immediate promotional effect. Thus, in conditions where overall baseline compliance should be assessed, feedback should not be given until overall ratios are estimated (i.e. the expected total number of opportunities for hand hygiene has been observed, see Section III.8).

III.4. THE OBSERVER AND HIS/HER ROLE

The primary role of the observer is openly and objectively to observe practices and to gather data on hand hygiene using the five indications along with the methodology and instructions proposed here. Before doing so, observers must be familiar with the five indications and their underlying concepts, which they must be able to apply, identify, differentiate and explain. Although the basic knowledge of hand hygiene required is summarized in this reference manual, the observer should have previous broad experience of patient care and clinical

management in order to be able to translate the concepts into practice. However, as an observer he/she must also be able to carry out the observational duties objectively. The observers' position vests them with a reference role, both for the persons observed and for administrative and decision-making staff. Usually they are also responsible for promoting and in some cases teaching hand hygiene, providing feedback and commenting on the results, and for helping shape the campaign in accordance with the needs of the health-care workers. The observer must, therefore, have knowledge and understanding of how a promotional campaign is carried out.

The observer introduces himself or herself at a convenient time to the health-care workers to be observed and to the patients (if applicable), and provides a general explanation for his or her presence (for example, observation of health-care practices). It is recommended that the period of observation be formally announced to the head nurse and chief doctor of the unit; in some settings written permission by the patients will be required. Health-care workers should be made aware whether observation is anonymous or not and of the way the collected information will be used. Respect for patients' privacy must always be reflected in the observer's behaviour, which should not interfere with health-care activities being carried out during the session. Observation should not be performed in extreme situations (emergency medical treatment, signs of uncontrolled stress in a heath-care worker being observed) as they do not reflect a "standard" care situation. The observer must be able to withdraw from such a situation. However, this does not preclude observation in emergency and intensive care wards.

The observer usually stands close to the point of care. While observing, it is advisable to place a solid backing under the form to make it easier to fill in. It is also easier to make corrections if a pencil and eraser are used; however, observers should constantly be aware of their need for objectivity and not change recording inputs unless an absolute error in observation has been made. A watch should be used for timing sessions. However, if the observer uses a wrist watch, he or she should set a good example by not wearing it on his or her wrist and by refraining from wearing other jewellery. Nails should be short and unvarnished, and false nails should not be worn as per all health-care workers.

III.5 THE OPPORTUNITIES FOR HAND HYGIENE

The basic references and definitions used by observers to identify hand hygiene actions during health-care activities are identical to those listed in Section II.5 and apply equally to hand hygiene observation, training and practice. However, observers have a different perspective on the indications and actions from health-care workers and trainers. When an indication is identified by the observer, he or she converts it into an opportunity while recording it, using a special accounting procedure. The opportunity determines the need to perform the hand hygiene action, whether the reason (the indication that leads to the action) is single or multiple. From the observer's point of view, the opportunity exists whenever one of the indications for hand hygiene occurs and is observed. Several indications may arise simultaneously, creating a single opportunity and requiring a single hand hygiene action (see Section II.5.6). The opportunity is an accounting unit equivalent to the number of hand hygiene actions required, regardless of the number of indications. Compliance is measured by dividing the number of actions (the numerator) by the number of opportunities (the denominator) (see Section III.7).

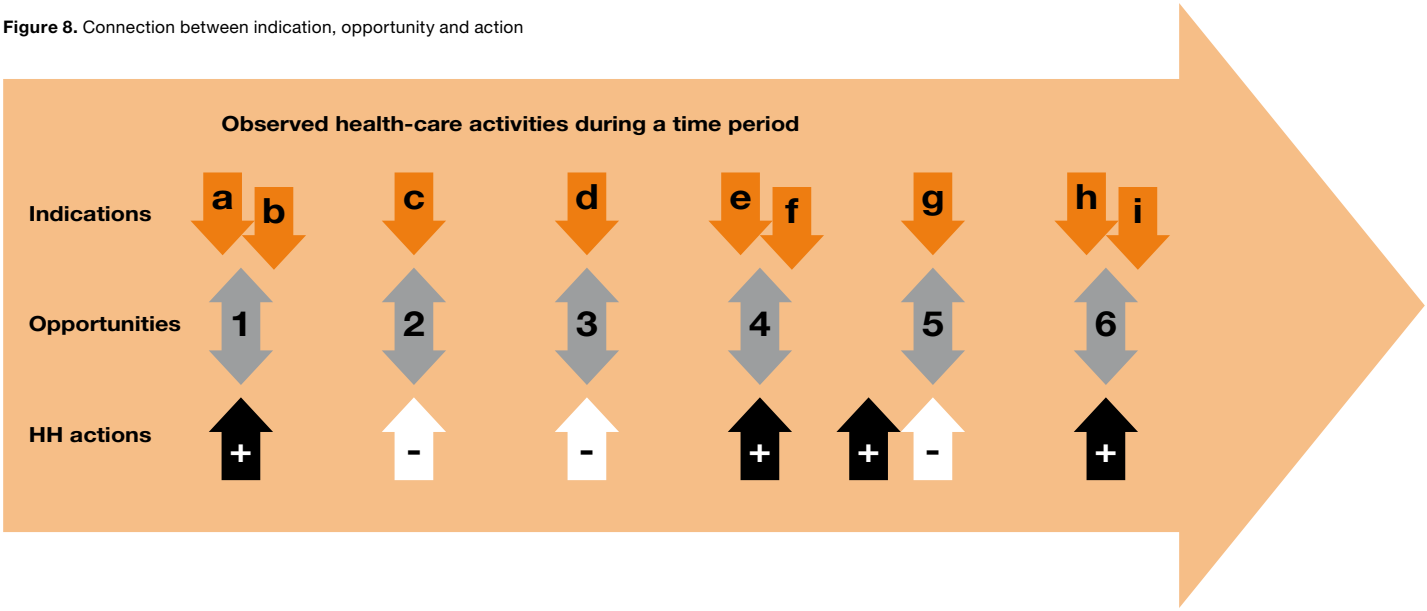
III.6. HAND HYGIENE ACTION SEEN BY THE OBSERVER

The observer should always establish a link between an observed hand hygiene action and an accounted opportunity. The action may be either negative (not performed) or positive (performed). In some cases the action may not be capable of being seen by the observer, so the observer should record only actions that he or she can clearly see and that correspond to indications; the observer is not allowed to assume that an action has taken place. The moment the observer identifies an indication, it is counted as an opportunity to which there should be a corresponding positive or negative action. A positive action indicates compliance; a negative action indicates non-compliance. A positive action that is not justified by an identified indication that therefore cannot be translated into an opportunity cannot be included when measuring compliance.

The chronology of events may be variable: the indication may precede (after body fluid exposure risk, after touching patient or after touching patient surroundings) or follow (before touching patient or before clean/aseptic task) the hand hygiene action. Recording an indication at a given moment does not exclude the possibility of combining other indications with it provided that the sequence of activities is adhered to and that there are corresponding positive hand hygiene actions. For example, a health-care worker enters the patient surroundings, performs hand hygiene (indication 2) and connects an intravenous infusion fixed to a three-way stopcock (without touching the patient). Once the procedure has been completed, the health-care worker takes the patient's pulse (indication 1). The performance of hand hygiene before the clean/aseptic task (indication 2) is also "valid" for indication 1, which follows.

The main focus of the observation should not be primarily the action but rather the identification of the indication to which the health-care worker then responds positively or negatively, either before or after the contact that determines the indication. Quite simply, if the observer identifies one or more indications, it is counted as an opportunity and either a positive or negative action is recorded. If the observer does not identify an indication, it is not counted as an opportunity and no action is recorded. The connection between indication, opportunity and action is illustrated in Figure 8.
Observers must always be careful not to make assumptions when they are not in possession of all elements to define an indication. For example: the observer sees a health-care worker approaching a patient without having seen what the health-care worker did before approaching the patient (whether or not he/she performed hand hygiene). The indication cannot be recorded.

Figure 8. Connection between indication, opportunity and action



According to Figure 8, during the observation of health-care activities in a given time x, the observer:

- identified nine indications;
- counted six opportunities: 1, 4 and 6 are each defined by two indications (a and b, e and f, as well as h and i);
- observed four positive (performed) hand hygiene actions of which three are linked to opportunities 1, 4 and 6; one observed action had no link to any opportunity;
- observed three negative actions (not performed) linked to opportunities 2, 3 and 5.

In addition, the observer should not record indications for hand hygiene arising from habitual or unconscious actions by the health-care worker during their duties, such as adjusting spectacles or pushing back a strand of hair. The fact that they are unconscious means they cannot be recorded as indication for hand hygiene. An exception, which must be counted, is when the performance of a habitual action leads to the interruption of a sterile procedure.

III.7. REPORTING HAND HYGIENE COMPLIANCE

When reporting data on hand hygiene practices, the observer must always bear in mind the following:

a) at least one indication for hand hygiene must be observed to define an opportunity;
b) each opportunity requires one hand hygiene action;
c) one action may apply to more than one indication;
d) a documented action may be either positive or negative provided it corresponds to an opportunity;
e) observation of a positive action does not always imply the existence of an opportunity.

Compliance with hand hygiene is the ratio of the number of performed actions to the number of opportunities and is expressed by the following formula:

$$\text{Compliance (\%)} = \frac{\text{Performed actions}}{\text{Opportunities}} \text{ X } 100$$

This reflects the degree of compliance by health-care workers with the requirement to practise hand hygiene during health-care activities in line with the five indications (moments) insofar as they are counted as opportunities. Compliance describes an exact equivalence between the number of actions and the number of opportunities. Non-compliance is when the number of opportunities exceeds the number of actions performed.

III.8. OBSERVATION METHODOLOGY

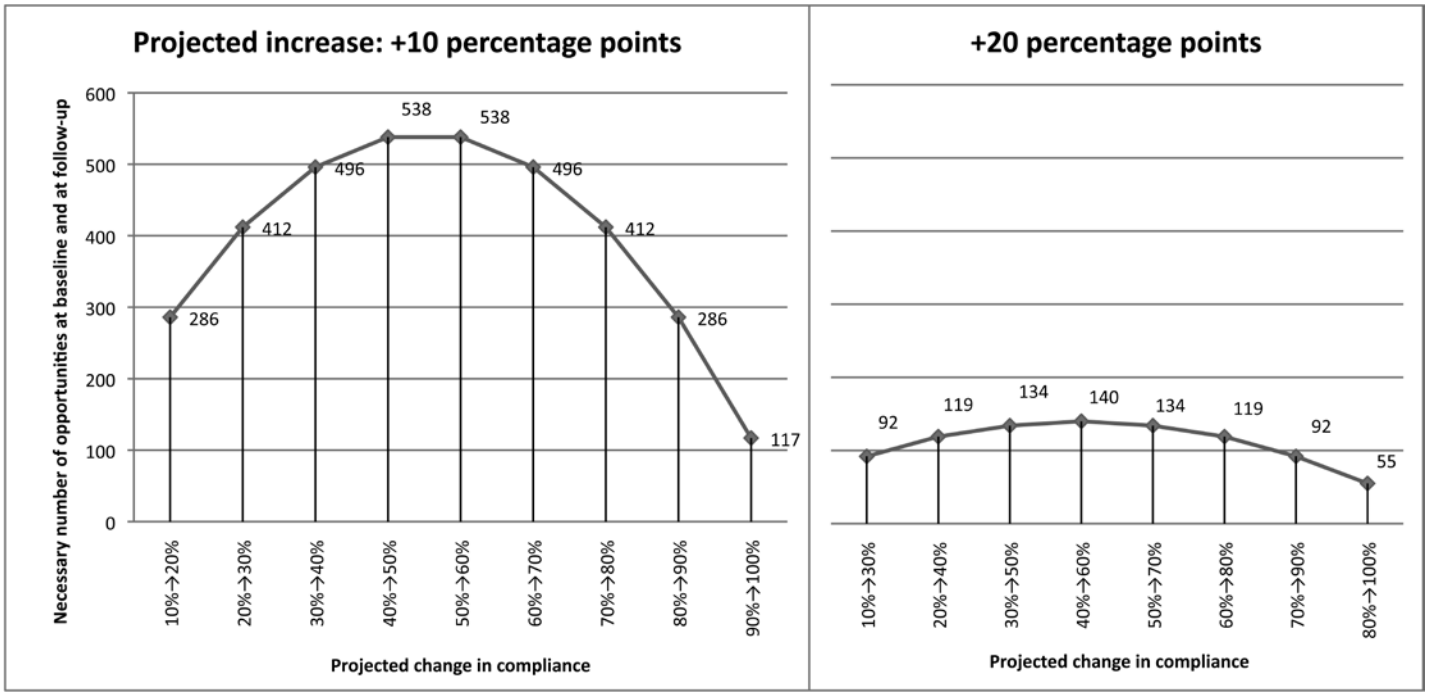
The reliability and impartiality of the data collected, which should accurately reflect the situation observed, will depend on the methodology developed and its implementation.
First, the scope of observation – setting, professional categories and indications – must be defined. According to the WHO multimodal hand hygiene improvement strategy, observation should take place in areas where the strategy is being, or will be, implemented: one or more health-care units/wards, one or more medical departments or the entire health-care facility. According to the methodology described here, only health-care workers in direct contact with patients are objects of observation, which in no way means that other health-care workers are excluded from performing hand hygiene (see Section II.3).

Health-care workers are divided into four broad **professional categories**: 1) nurse /midwife; 2) auxiliary; 3) medical doctor and 4) other health-care workers. Each category may be subdivided in accordance with the information required. Either all or some of the professional categories can be chosen for observation. The main requirement is that they should be representative in terms of professional category and setting. For example, if 50% of the work force in a given setting is nurses then 50% of the professional category being observed should be nurses. If the scope of the observation covers the whole health-care facility and all the health-care workers, all the medical services and all the professional categories must be represented in the observational data.

The observation **period** is defined as the time window during which compliance is measured in a certain setting. The length of the period will depend on the sample size.
When comparing hand hygiene compliance during two different periods (e.g. before and after hand hygiene promotion), the sample

size should be large enough to exclude the influence of chance. Ideally, a sample size calculation should therefore be performed at the stage of designing the hand hygiene monitoring scheme. There is no clear evidence on the ideal sample size needed to ensure representativeness, but sample size estimates indicate that 200 opportunities per observation period and per unit of observation (either ward, department, or professional category etc) are needed to compare results reliably. Figure 9 shows examples of sample size calculations according to estimates of baseline and follow-up compliance levels.

Figure 9. Sample size (number of opportunities) according to expected hand hygiene compliance increase of 10% or 20%



Adapted from Sax H et al. Am J Infect Control 2009, in press.

Depending on the size of the observation, a representative sample may be obtained either by randomization or by systematic observation. If it has been decided to observe nurses in a single health-care unit, each member of that category must be systematically observed. If the observation instead covers all the health-care workers in a medical department employing some 500 professionals, preferably randomization should be used. To do this, the methodology proposes sequencing the observation in sessions of limited duration, with each session being conducted in a different setting, with different health-care workers and at different times. This will generally ensure a representative sample. To allow comparison between data collected in different observation periods, the methods for determining the sampling should be similar.

The observation **session** is the time when the observation takes place in a defined setting (ward). It is numbered and timed (start and end times) in order to calculate its total duration. The time set for the duration should be about 20 minutes (+10 minutes) depending on the activity being observed. As far as possible, it is preferable for a health-care sequence to be observed from beginning to end. For this reason, the session may be extended if necessary. If the observed health-care workers need to interrupt their activity with patients while the observation is under way, it is preferable to terminate the session. Finally, if during the session no relevant health-care activity is observed, it would be pointless to prolong it.
The purpose of breaking down the observation into sessions in this way is to acquire an overview of practices (*different* health-care workers working in *different* places).
The methodology described here enables either an unlimited number of health-care workers in all four professional categories mentioned above to be observed either during a single session or a number limited up to four individuals per session. The former option, i.e. the larger sample, has the advantage of allowing the most rapid, large-scale collection of the greatest number of opportunities, even in settings where the intensity of activity is limited; its disadvantage is that it is not possible to collect and identify data at the individual level. On the other hand, by focusing on no more than four health-care workers it is possible to obtain information at the individual level and to identify the health-care worker even though it takes longer to collect the data.

The aim of the method proposed here is to generate data on compliance with hand hygiene on a large scale. It can easily be

modified nonetheless to suit specific local situations without changing the underlying principles that are based on the detection of the five moments for hand hygiene promoted by WHO. The method can be adapted according to the professional category and indication (i.e. only some categories can be observed and/or compliance with certain and not all of the five indications be detected). In addition, other items linked to the observational data may be incorporated without necessitating any fundamental change; for example the connection between the use of gloves and non-compliance with hand hygiene. In this case, when glove use is observed in parallel with a negative hand hygiene action (not performed), the information should be systematically recorded. The inclusion of such data enables to measure the impact of glove use on non-compliance. This information should not be confused with monitoring glove usage.

To sum up, the following principles must always be adhered to:

- define the scope of the observation
- gather data on 200 opportunities per observation per unit (either ward, department or professional category, etc) per observation period;
- observe practices by health-care professionals in direct contact with patients;
- document the data by professional category and by setting, gathered during 20 minute sessions (may be up to 10 minutes longer or shorter);
- do not observe more than three health-care workers simultaneously.

III.8.1 The Observation Form

The Observation Form (Appendix, pp. 1 and 2) contains a framework for conducting observations. It consists of two elements: a header and a corresponding grid.

Figure 10. The header

Facility:		Period Number*:		Session Number*:	
Service:		Date: (dd/mm/yy)	/ /	Observer:(initials)	
Ward:		Start/End time: (hh:mm)	: / :	Page N°:	
Department:		Session duration: (mm)		Country**:	
City**:					

The **header** (Figure 10) allows observations to be precisely located in time and place (setting, date, session duration and observer) and the data to be classified and recorded (period, session). This information must be entered before the observational data is recorded in order to ensure that the latter are eligible for use in the analysis.

According to the scale of the observation, the local institutional nomenclature system for naming the facility, the service, the ward and the department should be used to complete the header. The *WHO codes* can also be used, allowing data comparison from different institutions worldwide. These are: 1) medical (including dermatology, neurology, haematology, oncology, etc.); 2) surgical (including neurosurgery, urology, ENT, ophthalmology, etc.); 3) mixed (medical and surgical, including gynaecology); 4) obstetrics (including related surgery); 5) paediatrics (including related surgery); 6) intensive care and resuscitation; 7) emergency; 8) long-term care and rehabilitation; 9) ambulatory (including related surgery) and 10) other (to be specified).

Locating the observation in time allows the period of evaluation to be defined and dated in relation to interventions (before and after an intervention, follow-up, etc.).

Indicating the time when a session begins and ends allows its duration to be defined and compliance to be evaluated in relation to the intensity of hand hygiene opportunities during a given time. To conduct observation in sessions ensures, *inter alia*, that a range of settings, professional categories and hand hygiene moments are observed.

By inserting his or her initials in the Observation Form, the observer indicates that it has been checked before being returned. It also allows data to be verified and any sign of bias on the part of the observer to be identified. Each session is allocated a number to indicate that the data are ready to be analysed. This number is entered in a database when the data are processed as well as in the Basic Compliance Calculation. The page number only needs to be entered if more than one form is used during a single session.

Figure 11. The grid

Prof.cat			**Prof.cat**			**Prof.cat**			**Prof.cat**		
Code			**Code**			**Code**			**Code**		
N°			**N°**			**N°**			**N°**		
Opp.	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**
1	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	**1**	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	**1**	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	**1**	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves
Opp.	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**
2	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	**2**	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	**2**	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	**2**	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves

The data observation **grid** (Figure 11) contains the data needed to measure compliance. It is divided into four **columns**; the column can be dedicated either to a professional category (in this case different health-care workers of that category are recorded in the column) or to an individual health-care worker whose category is mentioned. Where data are classified by professional category, the number of health-care staff observed in each category during each session must be specified. There is no upper limit. Where data are classified by health-care worker, a maximum of four can be included in the same form.

Health-care workers are classified in the following categories and using codes as follows:

1. nurse/midwife
   - 1.1 nurse
   - 1.2 midwife
   - 1.3 nurse/midwife student
2. auxiliary
3. medical doctor
   - 3.1 in internal medicine
   - 3.2 surgeon,
   - 3.3 anaesthetist/resuscitator/emergency physician
   - 3.4 paediatrician
   - 3.5 gynaecologist
   - 3.6 consultant
   - 3.7 medical student
4. other health-care worker
   - 4.1 therapist (physiotherapist, occupational therapist, audiologist, speech therapist, etc)
   - 4.2 technician (radiologist, cardiology technician, operating room technician, laboratory technician, etc)
   - 4.3 other (dietician, dentist, social worker, other care professional)
   - 4.4 student

Each column (Figure 12) is independent of the others: the chronology of the data does not have to be the same in each column. It depends on the number of opportunities observed for each professional category or for each individual. Several health-care workers may be observed at the same time (when they are working with the same patient or in the same room); however, it is not advisable to observe more than three health-care workers *simultaneously*. Depending on the intensity of activities and indications, observers should limit the observation to one or two health-care workers so as to preclude the possibility of missing opportunities during a care sequence. The observer must always be able to capture and record all the indications that apply to the activities and to the health-care workers observed.

Each column contains eight boxes. Each box corresponds to an opportunity where the indications and the positive or negative actions observed are entered. The square box in the form (☐) means that no item is exclusive (if several items apply to the opportunity, they should all be marked); the circle (○) means that a single item applies to the opportunity and concerns negative hand hygiene actions (zero action) as well as information on glove use, if recorded.

A positive hand hygiene action is reported according to the method used: either by rubbing with an alcohol-based handrub, or washing with soap and water, or a combination of both in that order. According to this method, the quality of the performance is not evaluated (technique, time). Where a positive action is recorded without a corresponding indication, it should not be counted when data are analyzed. A negative hand hygiene action must be recorded so that the opportunity may be included in the analysis. The data grid employs the following abbreviations for the five hand hygiene indications:
bef pat: before touching a patient; bef.asept: before clean/aseptic procedure; aft.b.f: after body fluid exposure risk; aft.pat: after touching

Figure 12. The column

Prof.cat		
Code		
N°		
Opp.	**Indication**	**HH Action**
1	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves
Opp.	**Indication**	**HH Action**
2	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves
Opp.	**Indication**	**HH Action**
3	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves
Opp.	**Indication**	**HH Action**
4	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves
Opp.	**Indication**	**HH Action**
5	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves
Opp.	**Indication**	**HH Action**
6	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves
Opp.	**Indication**	**HH Action**
7	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves
Opp.	**Indication**	**HH Action**
8	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves

a patient; and aft.p.surr: after touching patient surroundings. Also included are HR: handrubbing with an alcohol-based formulation; HW: hand washing with soap and water. Separating the two hand hygiene methods enables the health-care workers' choice, if one exists, to be evaluated in accordance with the indications.
Glove use should only be recorded when the health-care professional under observation is wearing gloves at the time an opportunity occurs and does not perform a hand hygiene action.

Each form should be checked immediately after the observation session and the end time, duration of session and signature should be entered.

III.8.2 Basic Compliance Calculation

This form (Appendix, pp. 3 and 4) is particularly recommended for use by health-care facilities that do not have information technology tools for collecting and analysing electronic data. The tool is designed to produce global compliance results broken down by professional category and indication. However, it may also be used to subdivide the results by setting.

Compliance with hand hygiene is the ratio of the number of performed actions to the number of opportunities as expressed by the following formula:

$$\text{Compliance (\%)} = \frac{\text{Performed actions}}{\text{Opportunities}} \text{ X } 100$$

On the Observation Form, the indications observed are classified as opportunities for hand hygiene (the denominator), against which the positive hand hygiene action is set (the action serving as the numerator).

Results for compliance may be calculated globally but also broken down by professional category and setting. Thus when health-care workers receive the data, they can refer to their professional category or setting.

The form for *basic calculation of compliance per professional category* is shown below.

Figure 13.

	Facility:						Period:			Setting:					
	Prof.cat. _____			Prof.cat. _____			Prof.cat. _____			Prof.cat. _____			Total per session		
Session n°	Opp (n)	HW (n)	HR (n)	Opp (n)	HW (n)	HR (n)	Opp (n)	HW (n)	HR (n)	Opp (n)	HW (n)	HR (n)	Opp (n)	HW (n)	HR (n)
1															
2															
3															
…															
total															
calculation	Act (n)= / Opp (n) =			Act (n)= / Opp (n) =			Act (n)= / Opp (n) =			Act (n)= / Opp (n) =			Act (n)= / Opp (n) =		
compliance															

The total number of opportunities for each session, together with the total number of positive actions performed (rubbing or washing with soap and water) are entered. Each numbered line corresponds to the results of one session; the corresponding number is entered in the form to verify that the relevant data has been included when measuring compliance. The grid allows the results to be broken down by professional category and/or location. Compliance is calculated by adding up the results of each session and dividing the total number of positive actions by the total number of opportunities. From these calculations, the proportion of positive actions of handrubbing with an alcohol-based product or hand washing with soap and water can be extracted and put in relation to other aspects, notably the infrastructure available for hand hygiene.

Overall compliance with hand hygiene for each professional category and setting can also be calculated according to the five indications. This is not an accurate measurement of compliance, however, since indications do not constitute a completely reliable denominator, but the results give some idea of how health-care workers perform hand hygiene. The results reflect the connection between positive actions where hands are rubbed with an alcohol-based product or washed with soap and water and the indication for hand hygiene. Where several indications coincide in a single opportunity, each indication is recorded and the associated positive action is then multiplied by the number of indications.

The form for *basic calculation of compliance per indication* is shown below.

Figure 14.

	Facility:						Period:			Setting:					
	Before touching a patient			Before a clean/aseptic procedure			After body fluid exposure risk			After touching a patient			After touching patient surroundings		
Session n°	Indic (n)	HW (n)	HR (n)	Indic (n)	HW (n)	HR (n)	Indic (n)	HW (n)	HR (n)	Indic (n)	HW (n)	HR (n)	Indic (n)	HW (n)	HR (n)
1															
2															
3															
…															
total															
calculation	Act (n)= / Indic1 (n) =			Act (n)= / Indic2 (n) =			Act (n)= / Indic3 (n) =			Act (n)= / Indic4 (n) =			Act (n)= / Indic5 (n) =		
Ratio Act/Indic															

Similar to the basic compliance calculation per professional category, the total number of opportunities and positive actions is reported for each session. When carrying out an observation, constant vigilance is needed in order to avoid missing a connection between an indication and an action, which may occur at random during a session and is not specifically catered for in the form. Establishing a correlation between indications and actions enables education and training programmes for health-care workers to be designed on the basis of the observed behaviour as well as in light of the overall picture generated by the indications. While presenting results on hand hygiene in this way it is assumed that the people concerned know about the indications (definitions, transmission risk, examples), but it also provides initial support for the implementation of training measures to develop such knowledge.

PART IV
OTHER ASPECTS OF HAND HYGIENE

IV.1 HAND SAFETY

Skin underneath jewellery rings is more heavily colonized by germs than comparable areas of skin on fingers without rings; therefore wearing jewellery encourages the presence and survival of transient flora. The consensus recommendation is strongly to discourage the wearing of rings or other jewellery during health care.

The areas above and below nails attract germs, particularly if nails are long, varnished or if false nails are worn. Wearing artificial nails may contribute to the transmission of certain healthcare-associated pathogens.

Any changes in the superficial layer of the epidermis and deeper damage also encourage colonization by non-commensal skin flora (e.g. *Staphylococcus aureus* and Gram negative bacteria).

Ensuring hand safety by not wearing jewellery, keeping nails short and caring for the skin are other aspects of hand hygiene that enhance the efficacy of handrubbing with an alcohol-based handrub and washing with soap and water.

IV.2 HAND SKIN CARE

Frequent and repeated use of hand hygiene products, particularly soaps and other detergents, may cause irritant contact dermatitis among health-care workers, particularly in settings with intensive care activity where hand hygiene action is required many times per hour as well as during the winter season. Therefore, hand care that includes the regular use of good quality creams and the adoption of appropriate behaviours is of utmost importance to prevent skin damage.

Certain hand hygiene practices can increase the risk of skin irritation and should be avoided. For example, washing hands regularly with soap and water immediately before or after using an alcohol-based product is not only unnecessary, it may lead to dermatitis. Additionally, donning gloves while hands are still wet from either washing or applying alcohol increases the risk of skin irritation. Therefore, certain types of behaviour should be avoided and health-care workers should ensure that their hands are in good condition. Skin tolerability should be considered as one the most important criteria for the selection of a product.

The following aspects should be taken into consideration to ensure good skin condition:

- washing with soap and water is harsher on the skin than hand-rubbing with an alcohol-based handrub containing a humectant;
- certain detergent and antiseptic soaps cause more irritation than others a skin tolerability test is recommended before their introduction;
- powdered gloves can cause irritation when used concurrently with alcohol-based products;
- using a protective hand cream helps to improve skin condition provided it is compatible with the hand hygiene products and gloves used.

The following behaviours should be avoided:

- using soap and water and alcohol-based products simultaneously;
- using hot water for washing hands with soap and water;
- donning gloves when hands are wet, as this can cause irritation;
- performing hand hygiene outside the framework of indications;
- wearing gloves outside the framework of indications.

The following principles should be followed:

- rub hands until the alcohol-based product has completely evaporated;
- dry hands carefully after washing with soap and water;
- regularly apply a protective hand cream.

PART V
SELECTED REFERENCE LIST

Larson E, Girard R, Pessoa-Silva CL, Boyce J, Donaldson L, Pittet D. Skin reactions related to hand hygiene and selection of hand hygiene products. *American Journal of Infection Control* 2006;34:627-35.

Pittet D, Allegranzi B, Sax H, Dharan S, Pessoa da Silva C, Donaldson L, Boyce J. Evidence-based model for hand transmission during patient care and the role of improved practices. *Lancet Infectious Diseases* 2006;6:641-52.

Sax H, Allegranzi B, Uçkay I, Larson E, Boyce J, Pittet D. "My five moments for hand hygiene" – a user-centred design approach to understand, train, monitor and report hand hygiene. *Journal of Hospital Infection* 2007;67:9-21.

Allegranzi B, Pittet D. The role of hand hygiene in healthcare-associated infection prevention. *Journal of Hospital Infection* 2009 (in press).

Pittet D, Allegranzi B, Boyce J; on behalf of the WHO World Alliance for Patient Safety First Global Patient Safety Challenge Core Group of Experts. The WHO guidelines on hand hygiene in health care and their consensus recommendations. *Infection Control and Hospital Epidemiology* 2009; 30:611-22.

Pittet D. Hand hygiene promotion: 5 moments, 5 components, 5 steps, and 5 May 2009. *International Journal of Infection Control* 2009; 5:1-3.

H Sax, B Allegranzi, M-N Chraïti, J Boyce, E Larson, D Pittet. The World Health Organization hand hygiene observation method. *American Journal of Infection Control* 2009 (in press).

APPENDIX THE OBSERVATION AND CALCULATION FORM

World Health Organization | Patient Safety — A World Alliance for Safer Health Care | SAVE LIVES — Clean Your Hands

Observation Form

Facility:		Period Number*:		Session Number*:	
Service:		Date: (dd/mm/yy)	/ /	Observer: (initials)	
Ward:		Start/End time: (hh:mm)	: / :	Page N°:	
Department:		Session duration: (mm)		Country**:	
City**:					

Prof.cat			Prof.cat			Prof.cat			Prof.cat		
Code			Code			Code			Code		
N°			N°			N°			N°		
Opp.	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**
1	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	1	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	1	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	1	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves
Opp.	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**
2	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	2	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	2	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	2	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves
Opp.	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**
3	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	3	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	3	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	3	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves
Opp.	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**
4	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	4	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	4	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	4	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves
Opp.	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**
5	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	5	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	5	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	5	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves
Opp.	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**
6	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	6	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	6	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	6	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves
Opp.	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**
7	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	7	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	7	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	7	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves
Opp.	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**
8	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	8	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	8	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	8	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves

* To be completed by the data manager.

** **Optional**, to be used if appropriate, according to the local needs and regulations.

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

World Health Organization | Patient Safety — A World Alliance for Safer Health Care | SAVE LIVES — Clean Your Hands

General Recommendations

(refer to the Hand Hygiene Technical Reference Manual)

1. In the context of open and direct observations, the observer introduces him/herself to the health-care worker and to the patient when appropriate, explains his/her task and proposes immediate informal feed back.
2. The health-care worker, belonging to one of the main four following professional categories (see below), is observed during the delivery of health-care activities to patients.
3. Detected and observed data should be recorded with a pencil in order to be immediately corrected if needed.
4. The top of the form (header) is completed before starting data collection (excepted end time and session duration).
5. The session should last no more than 20 minutes (± 10 minutes according to the observed activity); the end time and the session duration are to be completed at the end of the observation session.
6. The observer may observe up to three health-care workers simultaneously, if the density of hand hygiene opportunities permits.
7. Each column of the grid to record hand hygiene practices is intended to be dedicated to a specific professional category. Therefore numerous health-care workers may be sequentially included during one session in the column dedicated to their category. Alternatively each column may be dedicated to a single health-care worker only of whom the professional category should be indicated.
8. As soon as you detect an indication for hand hygiene, count an opportunity in the appropriate column and cross the square corresponding to the indication(s) you detected. Then complete all the indications that apply and the related hand hygiene actions observed or missed.
9. Each opportunity refers to one line in each column; each line is independent from one column to another.
10. Cross items in squares (several may apply for one opportunity) or circles (only a single item may apply at one moment).
11. When several indications fall in one opportunity, each one must be recorded by crossing the squares.
12. Performed or missed actions must always be registered within the context of an opportunity.
13. Glove use may be recorded only when the hand hygiene action is missed while the health-care worker is wearing gloves.

Short description of item

Facility:	to complete according to the local nomenclature	
Service:	to complete according to the local nomenclature	
Ward:	to complete according to the local nomenclature	
Department:	to complete according to the following standardized nomenclature:	
	medical, including dermatology, neurology, haematology, oncology, etc.	surgery, including neurosurgery, urology, EENT, ophthalmology, etc.
	mixed (medical & surgical), including gynaecology	obstetrics, including related surgery
	paediatrics, including related surgery	intensive care & resucitation
	emergency unit	long term care & rehabilitation
	ambulatory care, including related surgery	other (to specify)
Period N°:	1) pre- / 2) post-intervention; and then according to the institutional counter.	
Date:	day (dd) / month (mm) / year (yy)	
Start/end time:	hour (hh) / minute (mm).	
Session duration:	difference between start and end time, resulting in minutes of observation.	
Session N°:	attributed at the moment of data entry for analysis.	
Observer:	observer's initials (the observer is responsible for the data collection and for checking their accuracy before submitting the form for analysis.	
Page N°:	to write only when more than one form is used for one session.	
Prof.cat:	according to the following classification:	
	1. nurse / midwife	1.1 nurse, 1.2 midwife, 1.3 student.
	2. auxiliary	
	3. medical doctor	3.1 in internal medicine, 3.2 surgeon, 3.3 anaesthetist / resuscitator / emergency physician, 3.4 paediatrician, 3.5 gynaecologist, 3.6 consultant, 3.7 medical student.
	4. other health-care worker	4.1 therapist (physiotherapist, occupational therapist, audiologist, speech therapist), 4.2 technician (radiologist, cardiology technician, operating room technician, laboratory technician, etc), 4.3 other (dietician, dentist, social worker and any other health-related professional involved in patient care), 4.4 student.
Number:	number of observed health-care workers belonging to the same professional category (same code) as they enter the field of observation and you detect opportunities.	
Opp(ortunity):	defined by one indication at least	
Indication:	reason(s) that motivate(s) hand hygiene action; all indications that apply at one moment must be recorded	
	bef.pat: before touching a patient	aft.b.f: after body fluid exposure risk
	bef.asept: before clean/aseptic procedure	aft.pat: after touching a patient
		aft.p.surr: after touching patient surroundings
HH action:	response to the hand hygiene indication(s); it can be either a positive action by performing handrub or handwash, or a negative action by missing handrub or handwash	
	HR: hand hygiene action by handrubbing with an alcohol-based formula HW: hand hygiene action by handwashing with soap and water	missed: no hand hygiene action performed

World Health Organization | Patient Safety — A World Alliance for Safer Health Care | SAVE LIVES — Clean Your Hands

Observation Form – Basic Compliance Calculation

	Facility:						Period:			Setting:					
	Prof.cat.			Prof.cat.			Prof.cat.			Prof.cat.			Total per session		
Session n°	Opp (n)	HW (n)	HR (n)	Opp (n)	HW (n)	HR (n)	Opp (n)	HW (n)	HR (n)	Opp (n)	HW (n)	HR (n)	Opp (n)	HW (n)	HR (n)
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															
total															
calculation	Opp (n) =		Act (n)=	Opp (n) =		Act (n)=	Opp (n) =		Act (n)=	Opp (n) =		Act (n)=	Opp (n) =		Act (n)=
compliance															

$$\text{Compliance (\%)} = \frac{\text{Performed actions}}{\text{Opportunities}} \times 100$$

Instructions for use

1. Define the setting outlining the scope for analysis and report related data according to the chosen setting.
2. Check data in the observation form. Hand hygiene actions not related to an indication should not be taken into account and vice versa.
3. Report the session number and the related observation data in the same line. This attribution of session number validates the fact that data has been taken into count for compliance calculation.
4. Results per professional category and per session (vertical):
   - 4.1 Sum up recorded opportunities (opp) in the case report form per professional category: report the sum in the corresponding cell in the calculation form.
   - 4.2 Sum up the positive hand hygiene actions related to the total of opportunities above, making difference between handwash (HW) and handrub (HR): report the sum in the corresponding cell in the calculation form.
   - 4.3 Proceed in the same way for each session (data record form).
   - 4.4 Add up all sums per each professional category and put the calculation to calculate the compliance rate (given in percent)
5. The addition of results of each line permits to get the global compliance at the end of the last right column.

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

World Health Organization | Patient Safety — A World Alliance for Safer Health Care | SAVE LIVES — Clean Your Hands

Observation Form – Optional Calculation Form

(Indication-related compliance with hand hygiene)

	Facility:						Period:			Setting:					
	Before touching a patient			Before a clean/aseptic procedure			After body fluid exposure risk			After touching a patient			After touching patient surroundings		
Session n°	Indic (n)	HW (n)	HR (n)	Indic (n)	HW (n)	HR (n)	Indic (n)	HW (n)	HR (n)	Indic (n)	HW (n)	HR (n)	Indic (n)	HW (n)	HR (n)
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															
total															
calculation	Act (n)= / Indic1 (n) =			Act (n)= / Indic2 (n) =			Act (n)= / Indic3 (n) =			Act (n)= / Indic4 (n) =			Act (n)= / Indic5 (n) =		
Ratio Act/Indic*															

Instructions for use

1. Define the setting outlining the scope for analysis and report related data according to the chosen setting.
2. Check data in the observation form. Hand hygiene actions not related to an indication should not be taken into account and vice versa.
3. If several indications occur within the same opportunity, each one should be considered separately as well as the related action.
4. Report the session number and the related observation data in the same line. This attribution of session number validates the fact that data has been taken into count for compliance calculation.
   - 4.1 Sum up indications per indication in the observation form: report the sum in the corresponding cell in the calculation form.
   - 4.2 Sum up positive hand hygiene actions related to the total of indications above, making the difference between handwash (HW) and handrub (HR): report the sum in the corresponding cell in the calculation form.
   - 4.3 Proceed in the same way for each session (observation form).
   - 4.4 Add up all sums per each indication and put the calculation to calculate the ratio (given in percent)
5. Results per indication (indic) and per session (vertical):

*Note: This calculation is not exactly a compliance result, as the denominator of the calculation is an indication instead of an opportunity. Action is artificially overestimated according to each indication. However, the result gives an overall idea of health-care worker's behaviour towards each type of indication.

SAVE LIVES
Clean Your Hands

World Health Organization

Patient Safety

A World Alliance for Safer Health Care

9 789241 598606