WHO GUIDELINE

The World Health Organization Guidelines on Hand Hygiene in Health Care and Their Consensus Recommendations

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The World Health Organization's Guidelines on Hand Hygiene in Health Care have been issued by WHO Patient Safety on 5 May 2009 on the occasion of the launch of the Save Lives: Clean Your Hands initiative. The Guidelines represent the contribution of more than 100 international experts and provide a comprehensive overview of essential aspects of hand hygiene in health care, evidence- and consensus-based recommendations, and lessons learned from testing their Advanced Draft and related implementation tools.

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The World Health Organization (WHO) First Global Patient Safety Challenge, launched in October 2005[1] and aimed at reducing healthcare-associated infection worldwide, identified the promotion of hand hygiene practices in health care as a priority measure and the entry point to improve infection control in Member States.[2] In April 2006, the WHO World Alliance for Patient Safety issued the Advanced Draft of the WHO Guidelines on Hand Hygiene in Health Care.[3] The document was developed with the contribution of more than 100 international experts with the objective of providing a comprehensive overview of essential aspects of hand hygiene in health care and evidence- and consensus-based recommendations for successful practice promotion. To achieve this objective, systematic reviews of the literature using PubMed, Ovid, MEDLINE, Embase, and the Cochrane Library were conducted, as well as referring to national and international guidelines and textbooks; task forces dedicated to specific topics were established; and three consultations of a core group of experts were held at WHO Headquarters.

In parallel to the production of the Advanced Draft, an implementation strategy (WHO Multimodal Hand Hygiene Improvement Strategy [http://www.who.int/gpsc/en/]) was developed, together with a wide range of tools (Pilot Implementation Pack) to help healthcare settings translate the guidelines into practice. A key element of the implementation strategy is a very innovative concept, "My five moments for hand hygiene" (Figure 1).[4] It integrates the indications for hand hygiene in five essential moments during the sequence of healthcare delivery and facilitates understanding and appropriate practice performance. According to WHO recommendations for guideline preparation, a test phase of the Advanced Draft guidelines was undertaken by using the implementation strategy and tools in eight pilot healthcare settings in seven countries representing all WHO regions worldwide. The objectives of this testing were: to provide local data on the resources required to carry out the recommendations; to generate information on feasibility, validity, reliability, and cost effectiveness of the interventions; and to adapt and refine proposed implementation strategies. Other healthcare settings around the world volunteered to participate autonomously in the test phase and provided WHO with feedback on implementation.

Starting in 2007, an update of the evidence through a review of the literature was performed up to June 2008. In 2008, an analysis of data and an evaluation of lessons learned from testing sites were conducted. The WHO Guidelines on Hand Hygiene in Health Care have now been finalized and include lessons learned from testing, updated evidence, and expert consensus through two further consultations. External and internal reviewers provided contributions and comments on both the Advanced Draft and the final Guidelines.

The WHO Guidelines on Hand Hygiene in Health Care provide healthcare workers (HCWs), hospital administrators, and health authorities with a thorough review of evidence on hand hygiene in health care and specific recommendations to improve practices and reduce the transmission of pathogenic microorganisms to patients and HCWs. They are intended to be implemented in any situation in which health

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FIGURE 1. The "My 5 moments for hand hygiene" concept (adapted from Sax et al.[4]).

care is delivered either to a patient or to a specific group in a population and in all settings where health care is permanently or occasionally performed, including home care by birth attendants.

In comparison with other international or national guidelines, the added values of the WHO guidelines are many: they bring a global perspective; they represent the challenge to bridge the gap between developing and developed countries, irrespective of resources available; and their feasibility has been tested in settings with different cultural backgrounds[5] and development levels.[6] Indeed, the WHO Guidelines explore many innovative aspects, such as religious and cultural aspects, promotion on a national scale, and social marketing. Attention has been paid to some critical topics, particularly safety issues, infrastructures required for hand hygiene, and strategies for improvement.

These Guidelines and the associated WHO Multimodal Hand Hygiene Improvement Strategy and Implementation Toolkit, updated and revised on the basis of data and lessons learned from testing, are designed to offer healthcare facilities in Member States a conceptual framework and practical tools for the application of recommendations in practice at the bedside.

Recommendations were formulated on the basis of the evidence described in the various sections and discussed in depth during the expert core group consultations. In addition to expert consensus, the criteria developed by the Healthcare Infection Control Practices Advisory Committee (HICPAC) of the United States Centers for Disease Control and Prevention (CDC) were used to categorize the consensus recommendations. It is anticipated that the recommendations in these Guidelines will remain valid until 2011, and the Patient Safety Department at WHO headquarters is committed to ensuring that the Guidelines are updated every two to three years.

The WHO Guidelines on Hand Hygiene in Health Care[7] together with the Implementation Toolkit have been available since 5 May 2009 on the occasion of the launch of the "Save Lives: Clean Your Hands" initiative (http://www.who.int/gpsc/en/). Based on the promising success observed with the Advanced Draft, these Guidelines are expected to be adopted as the gold standard for hand hygiene in many countries and healthcare settings worldwide. While ensuring consistency with the Guidelines' recommendations, individual adaptation according to local regulations, settings, needs, and resources is desirable.

The Guidelines Consensus Recommendations and their ranking system for evidence are detailed below.

RANKING SYSTEM FOR EVIDENCE

The consensus recommendations listed below (Sections 1–9) are categorized according to the CDC/HICPAC system, adapted as follows:

- Category IA. Strongly recommended for implementation and strongly supported by well-designed experimental, clinical, or epidemiological studies.
- Category IB. Strongly recommended for implementation and supported by some experimental, clinical, or epidemiological studies and a strong theoretical rationale.
- Category IC. Required for implementation, as mandated by federal and/or state regulation or standard.
- Category II. Suggested for implementation and supported by suggestive clinical or epidemiological studies or a theoretical rationale or a consensus by a panel of experts.

RECOMMENDATIONS

1. Indications for hand hygiene

   A. Wash hands with soap and water when visibly dirty or visibly soiled with blood or other body fluids (IB) or after using the toilet (II).[8-18]

   B. If exposure to potential spore-forming pathogens is strongly suspected or proven, including outbreaks of *Clostridium difficile,* handwashing with soap and water is the preferred means (IB).[19-22]

   C. Use an alcohol-based handrub as the preferred means for routine hand antisepsis in all other clinical situations described in items D(a) to D(f) listed below, if hands are not visibly soiled (IA).[23-31] If alcohol-based handrub is not obtainable, wash hands with soap and water (IB).[25,32,33]

D. Perform hand hygiene:

   a) before and after touching the patient (IB);[34-43]
   b) before handling an invasive device for patient care, regardless of whether or not gloves are used (IB); [44]
   c) after contact with body fluids or excretions, mucous membranes, non-intact skin, or wound dressings (IA);[8,40,42,45]
   d) if moving from a contaminated body site to another body site during care of the same patient (IB);[35,36,39,42,45]
   e) after contact with inanimate surfaces and objects (including medical equipment) in the immediate vicinity of the patient (IB);[35,39,41, 42,45-49]
   f) after removing sterile (II) or non-sterile (IB) gloves.[35,50-53]

   Indications for hand hygiene at the point of care are integrated in Figure 1 that illustrates the concept of "My five moments for hand hygiene".[4]

E. Before handling medication or preparing food perform hand hygiene using an alcohol-based handrub or wash hands with either plain or antimicrobial soap and water (IB).[11-14]

F. Soap and alcohol-based handrub should not be used concomitantly (II).[54,55]

2. Hand hygiene technique

A. Apply a palmful of alcohol-based handrub and cover all surfaces of the hands. Rub hands until dry (IB) (Figure 2A).[56,57]

B. When washing hands with soap and water, wet hands with water and apply the amount of product necessary to cover all surfaces (Figure 2B). Rinse hands with water and dry thoroughly with a single-use towel. Use clean, running water whenever possible. Avoid using hot water, as repeated exposure to hot water may increase the risk of dermatitis (IB).[58-60] Use towel to turn off tap/faucet (IB).[61-65] Dry hands thoroughly using a method that does not recontaminate hands. Make sure towels are not used multiple times or by multiple people (IB).[66-69]

C. Liquid, bar, leaf or powdered forms of soap are acceptable. When bar soap is used, small bars of soap in racks that facilitate drainage should be used to allow the bars to dry (II).[70-76]

3. Recommendations for surgical hand preparation

A. Remove rings, wrist-watch, and bracelets before beginning surgical hand preparation (II).[77-81] Artificial nails are prohibited (IB).[82-86]

B. Sinks should be designed to reduce the risk of splashes (II).[87,88]

C. If hands are visibly soiled, wash hands with plain soap before surgical hand preparation (II). Remove debris from underneath fingernails using a nail cleaner, preferably under running water (II).[89]

D. Brushes are not recommended for surgical hand preparation (IB).[90-96]

E. Surgical hand antisepsis should be performed using either a suitable antimicrobial soap or suitable alcohol-based handrub, preferably with a product ensuring sustained activity, before donning sterile gloves (IB).[95,97-103]

F. If quality of water is not assured in the operating theatre, surgical hand antisepsis using an alcohol-based handrub is recommended before donning sterile gloves when performing surgical procedures (II).[95,98,100,104]

G. When performing surgical hand antisepsis using an antimicrobial soap, scrub hands and forearms for the length of time recommended by the manufacturer, typically 2–5 minutes. Long scrub times (e.g. 10 minutes) are not necessary (IB).[91,103,105-111]

H. When using an alcohol-based surgical handrub product with sustained activity, follow the manufacturer's instructions for application times. Apply the product to dry hands only (IB).[112,113] Do not combine surgical hand scrub and surgical handrub with alcohol-based products sequentially (II).[54]

I. When using an alcohol-based handrub, use sufficient product to keep hands and forearms wet with the handrub throughout the surgical hand preparation procedure (IB).[114-116]

J. After application of the alcohol-based handrub as recommended, allow hands and forearms to dry thoroughly before donning sterile gloves (IB).[95,100]

4. Selection and handling of hand hygiene agents

A. Provide HCWs with efficacious hand hygiene products that have low irritancy potential (IB).[24, 62,117-123]

B. To maximize acceptance of hand hygiene products by HCWs, solicit their input regarding the skin tolerance, feel, and fragrance of any products under consideration (IB).[23,24,120,124-129] Comparative evaluations may greatly help in this process.[119,124, 125,130]

C. When selecting hand hygiene products

   a) determine any known interaction between products used to clean hands, skin care products, and the types of glove used in the institution (II);[131,132]

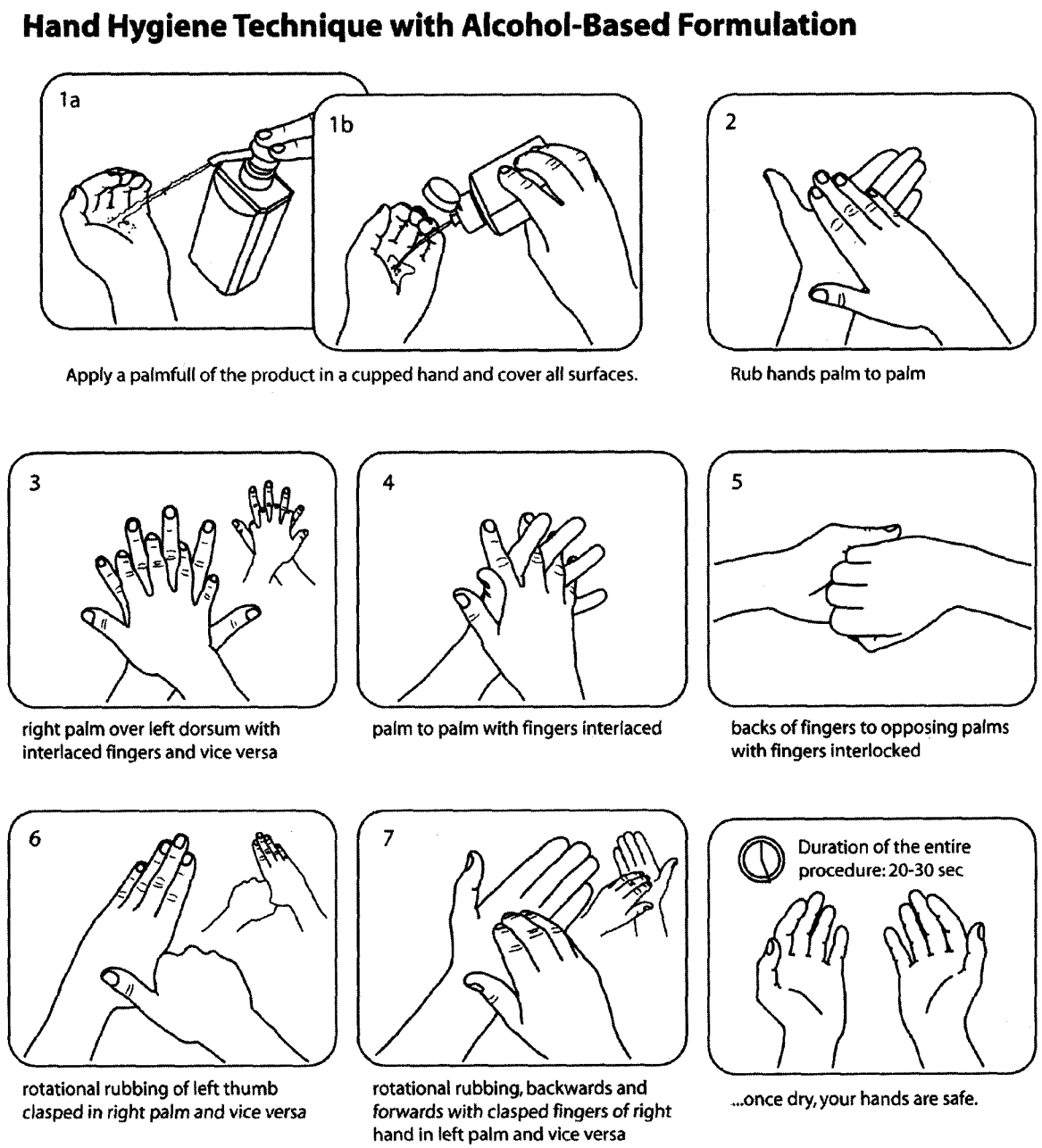

FIGURE 2A. Hand hygiene technique with an alcohol-based formulation.[3]

b) solicit information from manufacturers about the risk of product contamination (IB);[133-135]
c) ensure that dispensers are accessible at the point of care (IB);[28,136]
d) ensure that dispensers function adequately and reliably and deliver an appropriate volume of the product (II);[25,137]
e) ensure that the dispenser system for alcohol-based handrubs is approved for flammable materials (IC);
f) solicit and evaluate information from manufacturers regarding any effect that hand lotions, creams, or alcohol-based handrubs may have on the effects of antimicrobial soaps being used in the institution (IB);[131,138,139]
g) cost comparisons should only be made for products that meet requirements for efficacy, skin tolerance, and acceptability (II).[129,140]

D. Do not add soap (IA) or alcohol-based formulations (II) to a partially empty soap dispenser. If soap dispensers are reused, follow recommended procedures for cleansing.[141,142]

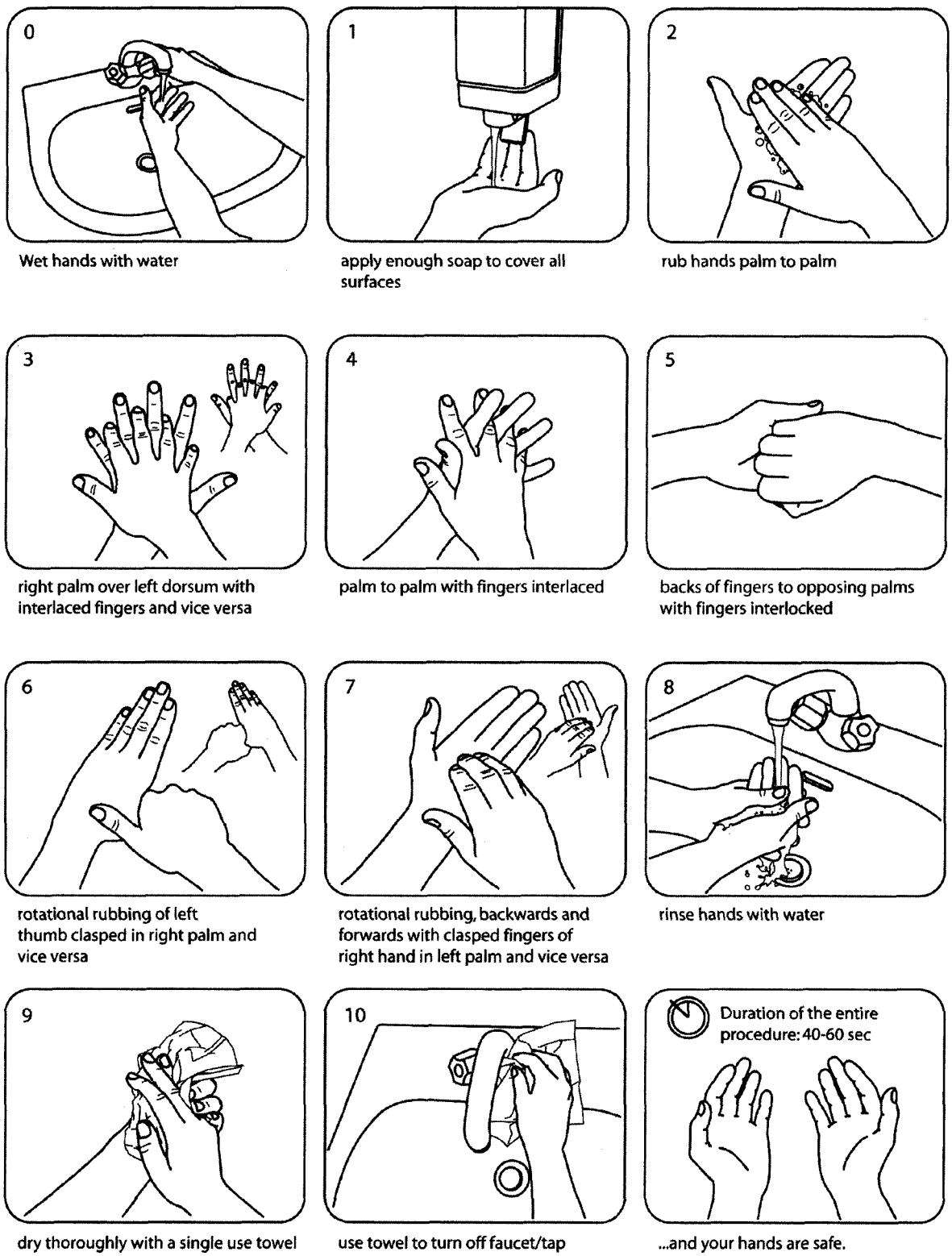

FIGURE 2B. Handwashing technique with soap and water.[3]

5. Skin care

   A. Include information regarding hand-care practices designed to reduce the risk of irritant contact dermatitis and other skin damage in education programmes for HCWs (IB).[143,144]
   B. Provide alternative hand hygiene products for HCWs with confirmed allergies or adverse reactions to standard products used in the healthcare setting (II).
   C. Provide HCWs with hand lotions or creams to minimize the occurrence of irritant contact dermatitis associated with hand antisepsis or handwashing (IA).[120,121,144-147]
   D. When alcohol-based handrub is available in the healthcare facility for hygienic hand antisepsis, the use of antimicrobial soap is not recommended (II).
   E. Soap and alcohol-based handrub should not be used concomitantly (II).[54]

6. Use of gloves

   A. The use of gloves does not replace the need for hand hygiene by either handrubbing or handwashing (IB).[35,50-52,148-150]
   B. Wear gloves when it can be reasonably anticipated that contact with blood or other potentially infectious materials, mucous membranes, or non-intact skin will occur (IC).[151-153]
   C. Remove gloves after caring for a patient. Do not wear the same pair of gloves for the care of more than one patient (IB).[35,41,50-52,154,155]
   D. When wearing gloves, change or remove gloves during patient care if moving from a contaminated body site to either another body site (including non-intact skin, mucous membrane or medical device) within the same patient or the environment (II).[50,51,156]
   E. The reuse of gloves is not recommended (IB).[157] In the case of glove reuse, implement the safest reprocessing method (II).[158]

7. Other aspects of hand hygiene

   A. Do not wear artificial fingernails or extenders when having direct contact with patients (IA).[82,86,159-162]
   B. Keep natural nails short (tips less than 0.5 cm long or approximately 1/4 inch) (II).[160]

8. Educational and motivational programmes for healthcare workers

   A. In hand hygiene promotion programmes for HCWs, focus specifically on factors currently found to have a significant influence on behaviour, and not solely on the type of hand hygiene products. The strategy should be multifaceted and multimodal and include education and senior executive support for implementation (IA).[25,57,163-179]
   B. Educate HCWs about the type of patient-care activities that can result in hand contamination and about the advantages and disadvantages of various methods used to clean their hands (II).[25,57,168,178-185]
   C. Monitor HCWs' adherence to recommended hand hygiene practices and provide them with performance feedback (IA).[25,128,165,166,168,178,180-182,184,186,187]
   D. Encourage partnerships between patients, their families, and HCWs to promote hand hygiene in healthcare settings (II).[188-190]

9. Governmental and institutional responsibilities

   9.1 For healthcare administrators

   A. It is essential that administrators ensure conditions are conducive to the promotion of a multifaceted, multimodal hand hygiene strategy and an approach that promotes a patient safety culture by implementation of points B–I below.
   B. Provide HCWs with access to a safe, continuous water supply at all outlets and access to the necessary facilities to perform handwashing (IB).[178,191,192]
   C. Provide HCWs with a readily accessible alcohol-based handrub at the point of patient care (IA).[25,27,28,30,193-197]
   D. Make improved hand hygiene adherence (compliance) an institutional priority and provide appropriate leadership, administrative support, financial resources, and support for hand hygiene and other infection prevention and control activities (IB).[25,163,168,170,198]
   E. Ensure HCWs have dedicated time for infection control training, including sessions on hand hygiene (II).[172,199]
   F. Implement a multidisciplinary, multifaceted and multimodal programme designed to improve adherence of HCWs to recommended hand hygiene practices (IB).[25,163,200]
   G. With regard to hand hygiene, ensure that the water supply is physically separated from drainage and sewerage within the healthcare setting, and provide routine system monitoring and management (IB).[201]
   H. Provide strong leadership and support for

hand hygiene and other infection prevention and control activities (II).[163]

I. Alcohol-based handrub production and storage must adhere to the national safety guidelines and local legal requirements (II).

9.2 For national governments

A. Make improved hand hygiene adherence a national priority and consider provision of a funded, coordinated implementation programme, while ensuring monitoring and long-term sustainability (II).[202-205]

B. Support strengthening of infection control capacities within healthcare settings (II).[199,206,207]

C. Promote hand hygiene at the community level to strengthen both self-protection and the protection of others (II).[16-18,208-211]

D. Encourage healthcare settings to use hand hygiene as a quality indicator (Australia, Belgium, France, Scotland, USA) (II).[185,212]

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