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SURGICAL SITE INFECTION PREVENTION
Key facts on surgical site skin preparation

THINGS YOU SHOULD KNOW
What does the World Health Organization (WHO) recommend?

The 2016 WHO Global guidelines for the prevention of surgical site infections (SSIs) recommend that:

> alcohol-based antiseptic solutions containing chlorhexidine gluconate (CHG) should be used for surgical site skin preparation in patients undergoing surgical procedures.

Surgical site skin preparation is the preoperative treatment (cleaning and disinfection) of the patient's intact skin done prior to surgery within the operating room (OR).

WHAT should be done?

- Carefully **wash and clean** the skin around the incision site. Full-body washing with detergents or antiseptics should be performed before the operation and outside of the OR (see "Key facts on patient bathing and hair removal").
- **Use an alcohol-based CHG solution** (usually, a 2% chlorhexidine isopropanol solution) for surgical site skin preparation.
- **Apply the solution using sterile gauze and instruments** with movements from clean to dirty areas starting from the centre of the incision site and moving outwards, maintaining an aseptic technique. Then, allow to dry fully before incision.
- **Ensure** that the **drapes** are not saturated with alcohol or that the alcohol-based solution has not formed a pool underneath the patient before operating.
- Ensure that any **adverse events** associated with the solutions used **are investigated and recorded**.
- **Record** known information on surgical site skin preparation on surveillance forms and in patient records (for example, that it has been performed according to standard procedures and no adverse event occurred, time, and product used).
- **Support colleagues** to adhere to this recommendation and be an advocate for it.

Local production

- If the commercial availability of CHG in an alcohol-based solution is limited or too expensive, the use of a 2% chlorhexidine isopropanol solution for skin disinfection produced locally according to the following formula might be an option:
  - isopropanol 62.7% g/g;
  - chlorhexidine 12.1% g/g taken from a 18.8% g/g chlorhexidine digluconate water solution, and
  - distilled water up to 100%.
- Alcohol-based solutions should not be used on neonates or be in contact with mucosa or eyes. CHG solutions must not be allowed to come into contact with the brain, meninges, eye or middle ear. The effectiveness of using alcohol-based CHG solutions is not proven for paediatric patients.
- A video on the appropriate procedure to be used for surgical site skin preparation is available from WHO at **http://www.who.int/infection-prevention/tools/surgical/training_education/en/**.

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WHEN should the recommendations be applied?

- **This recommendation is applicable in the preoperative period.**
- Surgical site skin preparation is performed prior to surgery within the OR, immediately before draping and incision for the surgical procedure.

WHO should support these recommendations to ensure successful implementation?

- Depending on where the facility/surgical services stand with regards to this recommendation, the following staff should be involved in putting it in place or updating local policies/standards or improving compliance with the recommendation

1. **OR and surgical teams** are the key players in ensuring compliance with this recommendation according to gold standards;
2. **infection prevention and quality improvement** teams can facilitate uptake/update of the standard procedures for surgical skin preparation according to the recommendation and monitor compliance;
3. **pharmacists and procurement services** to obtain or locally produce alcohol-based CHG solutions;
4. **senior administrators** (including finance managers) should be involved in the decision-making on implementing the recommendation to ensure that an adequate budget is available for continuous product provision, thus motivating staff to comply with the recommendation in the context of an institutional safety climate.

KEY FACTS
WHY are these recommendations important?

- Infection is the most frequent complication of surgery in Africa and SSIs are the most frequent type of infection acquired in health care in low- and middle-income countries. In Europe and the United States of America, they are the second most frequent type of health care-associated infection and the most frequent type on admission.
- Scientific evidence shows that the use of alcohol-based antiseptic solutions for the surgical preparation of the intact skin is more effective compared to aqueous solutions in reducing SSI as alcohol has a superior antimicrobial activity.
- Unfortunately, the effectiveness of using alcohol-based CHG solutions is not proven for paediatric patients as most commercially-available products have no indications for their use in this population due to the lack of studies. Although it is unlikely that high-quality evidence will be available in the future on paediatric patients, mainly due to ethical reasons, logical reasoning might point to a possible beneficial use on intact and mature skin in general, but not in neonates (that is, a child under 28 days of age).
- A large proportion of health care-associated infections originate from the patients' own flora. The aim of this procedure is to reduce the microbial load on the patient's skin as much as possible before incision of the skin barrier.
- Evidence also points to alcohol-based CHG solutions as more effective in reducing SSI rates compared to alcohol-based povidone-iodine.
- Summaries of the systematic reviews of the evidence supporting these recommendations can be found in the Global guidelines for the prevention of SSIs (**http://www.who.int/infection-prevention/publications/ssi-guidelines/en/** and their Appendices (**http://www.who.int/infection-prevention/publications/ssi-web-appendices/en/**).
- WHO provides further implementation support in the form of tools **http://www.who.int/infection-prevention/tools/surgical/en/**.