



The six golden rules to improve compliance in hand hygiene

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Summary Improvement of compliance in hand hygiene is probably the most effective step in reducing the incidence of nosocomial infections (NI). But improvement of compliance is known to be complex. Six possibilities for improving compliance are available although some of them may be difficult to carry out. Rule 1: Select an alcohol-based hand rub which has a good skin tolerance and is acceptable to health care workers to use. This has been shown to improve compliance. Rule 2: The hand rub shall be easily available. Wall dispensers near the patient and pocket bottles may well help. Other possibilities should be assessed locally. Rule 3: Implement teaching and promotion of hand hygiene, which has been shown to be very effective. This is may be the most effective tool but will cost time and money. If money is a problem, rule 4 may be the solution. Rule 4: Create a hospital budget which covers all costs involved with preventable nosocomial infection. Combine it with the budget for hand hygiene products. Even a small number of prevented NI largely outweighs the cost of effective hand hygiene products. Rule 5: Get senior staff to set a good example in order to motivate junior staff, because negligence in hand hygiene appears to correlate with the number of professional years. Rule 6: Have the patient-staff ratio well balanced. It has been shown that staff shortage decreases hand hygiene compliance. Other factors may be important as well, but implementation of these 6 golden rules could be an effective step into the right direction.

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Rule 1. Select an alcohol-based hand rub which has a good skin tolerance and is acceptable to health care workers to use. This has been shown to improve compliance.

Most alcohol-based hand rubs contain emollients¹ and are well tolerated by human skin.^{2,3} Some of the preparations have been assessed regarding their influence on compliance in hand hygiene. On a medical intensive care unit (ICU) 53 health care workers were observed for compliance in hand hygiene. In period 1, hand washing was the only option. After introduction of Sterillium, compliance was measured again (period 2). Compliance

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increased significantly from 42.2% to 60.9% and was still significantly higher at 51.3% after 3 months. The effect was observed among different professional groups (nurses, senior doctors, residents).⁴ In another study the same preparation was introduced on 4 hospital units with approximately 80 health care workers. Compliance increased from 62.2% to 66.5% but the difference was not significant. At the same time the skin condition improved: skin dryness decreased significantly and irritation decreased significantly.⁵ So far no comparative studies between different alcohol-based hand rubs and their effect on compliance are available. In addition, the personal perception of the emollient effect and the effect on skin dryness may vary significantly² and have an effect on compliance of which one is not aware.

Rule 2. The hand rub shall be easily available. Wall dispensers near the patient and pocket bottles may well help. Other possibilities should be assessed locally.

Wall dispensers are appropriate to ensure availability of hand disinfectants. They can be installed next to the patient's bed, at the wash basin, or near the door. Whatever location is chosen, the dispenser should not be hidden anywhere which will discourage health care workers from using them. Wall dispensers should also be functional. In a recent study only 77% of a certain type of wall dispenser were found to be functional after 16 months.⁶ Another possibility is the use of pocket bottles. If health care workers carry the hand disinfectant with them, it is impossible to provide 'lack of availability' as a reason for non-compliance. Pocket bottles have been shown to be part of a successful campaign for improvement of hand hygiene compliance.⁷

Rule 3. Implement teaching and promotion of hand hygiene which has been shown to be very effective. This may be the most effective tool but will cost time and money.

Teaching of hand hygiene, e.g. at medical or nursing schools, is certainly important in achieving a profound understanding of its impact, background and practical modalities. At the same time teaching of health care workers 'on the job' serves to create and maintain awareness for this topic. Promotion of hand hygiene over the years has been shown to be a very effective tool to improve compliance in hand hygiene from 48% to 66%.⁷ This effect was mainly explained by an increase of the hand disinfection rate from 13.6% to 37% whereas the hand washing rate remained almost unchanged. If money is a problem, rule 4 may be the solution.

Rule 4. Create a hospital budget which covers all costs involved with preventable nosocomial

infection. Combine it with the budget for hand hygiene products. A small number of prevented NI largely outweighs the cost of effective hand hygiene products.

Nosocomial infections cost a lot of money. Septicaemia for example leads to additional costs of approximately \$ 33,268 per case or even \$ 40,890 per survivor,⁸ surgical site infection lead to additional costs of \$ 17,708 in orthopaedic surgery.⁹ Funding for infectious complications seems unlimited whereas funding for appropriate hand hygiene products is often strictly limited. One possible solution is creation of a budget for nosocomial infections which will first of all make the actual or estimated costs for infectious complications obvious and which will certainly lead to enforcement of preventive strategies. This budget could be combined with the budget for hand hygiene products, and quite certainly all discussions about limited resources for appropriate hand hygiene products will come to an abrupt end.

Rule 5. Get the senior staff to set a good example in order to motivate junior staff because negligence in hand hygiene seems to correlate with the number of professional years.

An analysis of compliance rates among different professional groups revealed that senior doctors have the lowest compliance (37.2%) compared with nurses (45.9%) or junior doctors (46.9%)⁴ although it can be expected that they possess the best knowledge and have a relevant professional experience. Somehow knowledge and experience do not seem to translate automatically into clinical practice. Does negligence in hand hygiene really correlate with the number of professional years? Another aspect is that senior doctors set an example with their behaviour. It is therefore even more important for senior doctors to set a good example which will make it more difficult for junior doctors to neglect hand hygiene. They should be included in teaching and training sessions and be reminded of their important role for other health care workers.

Rule 6. Have the patient-staff ratio well balanced. It has been shown that staff shortage decreases hand hygiene compliance.

An outbreak of nosocomial infections caused by *Enterobacter cloacae* among neonates has been associated with poor compliance in hand hygiene. The low compliance rate was explained by overcrowding with often more than 20 patients on the neonatal intensive care unit which had a maximum capacity of 15 patients. During this time, no hand wash before contact with intravenous line was observed in 75% whereas in control period the rate was 30%. The number of staff remained almost unchanged during the outbreak period resulting in a

relative lack of staff.¹⁰ Appropriate staffing can help to ensure compliance in hand hygiene.

These are only a few, but successful, examples of how to improve compliance in hand hygiene. A success will depend on many factors with some of them being out of reach for many health care workers who want to adopt improvement in hand hygiene as a professional goal.

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