and quoted paper. We support his work with the BMA in ensuring quality of surgical instruments from the developed world through improved working conditions and regulation.

COMMENT ON

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Appropriate surgical hand antisepsis

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Hajipour and co-workers recently evaluated two options for surgical hand antisepsis (3-minute hand wash with either chlorhexidine or alcohol gel) and concluded that the use of alcohol was associated with a higher risk of bacterial contamination of surgeons' hands and that it is not a suitable alternative to chlorhexidine when washing hands before surgery. Based on their research, I would be very reluctant to draw this conclusion and would like to address some major points of concern.

The end-point of their study is the number of colonies on agar plates after fingertip agar imprints obtained from surgeons' hands after taking off surgical gloves. Apparently, the agar did not contain any neutralising agents in order to inactivate residual chlorhexidine. This is a major scientific bias. Bacteria may well be present on a hand and transferred to the agar but may not multiply on it due to residual chlorhexidine in a bacteriostatic concentration leading to a significant overestimation of the efficacy of chlorhexidine.¹ That is why I would consider all data obtained in the chlorhexidine group to be invalid.

It is also not acceptable to mention only 'alcohol gel'. The efficacy of an alcohol-based hand rub depends on the type and concentration of alcohol, the application time and the viscosity.² Many gels have a concentration of alcohol below 70% and have been described to be significantly less effective compared with rinses containing 75% alcohol or more.³ Well-formulated, alcohol-based hand rubs are also significantly more effective than antimicrobial soaps when tested with a 3-minute application time.⁴ In addition, well-formulated, alcohol-based hand rubs

may reveal their efficacy within 1.5 minutes⁵ which may not even be achieved with some of the antimicrobial soaps in 3 minutes.⁴

There is much valid evidence in the literature that well-formulated, alcohol-based hand rubs provide a better and faster efficacy and a better dermal tolerance in comparison to antimicrobial soaps.² I just hope that research with rather invalid methods does not encourage surgeons to go back to the second-best option in surgical hand antisepsis.

References

1. Kampf G, Shaffer M, Hunte C. Insufficient neutralization in testing a chlorhexidine-containing ethanol-based hand rub can result in a false positive efficacy assessment. *BMC Infect Dis* 2005; **5**: 48.
2. Kampf G, Kramer A. Epidemiologic background of hand hygiene and evaluation of the most important agents for scrubs and rubs. *Clin Microbiol Rev* 2004; **17**: 863–93.
3. Kramer A, Rudolph P, Kampf G, Pittet D. Limited efficacy of alcohol-based hand gels. *Lancet* 2002; **359**: 1489–90.
4. Marchetti MG, Kampf G, Finzi G, Salvatorelli G. Evaluation of the bactericidal effect of five products for surgical hand disinfection according to prEN 12054 and prEN 12791. *J Hosp Infect* 2003; **54**: 63–7.
5. Kampf G, Ostermeyer C, Heeg P, Paulson D. Evaluation of two methods of determining the efficacies of two alcohol-based hand rubs for surgical hand antisepsis. *Appl Environ Microbiol* 2006; **72**: 3856–61.

AUTHOR'S RESPONSE

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I believe our published paper is valid on three counts.

1. We did use Hydrex alcohol hand rub which contains 70% alcohol and 0.5% chlorhexidine against chlorhexidine hand wash. They both contain chlorhexidine and the recommended alcohol concentration.
2. We did not want to use a neutralising agent because we wanted to demonstrate the latency effect of chlorhexidine which continues to have an effect even during the procedure on any possible remaining finger tip contamination. This is an extremely important fact especially in some very long orthopaedic procedures and multiple trauma. Unlike any other surgical speciality, orthopaedic cases require a clean air flow system and, as glove perforation is quite common due to contact with exposed bone, finger tip contamination can lead to infection around the prosthesis. This is considered a total failure by any orthopaedic surgeon.