

### 1.5.1 INFORMATION FOR BIBLIOGRAPHICAL APPLICATIONS

“Chlorhexidine alcoolique Gilbert Healthcare 2%, solution pour application cutanée” contains as active substances chlorhexidine digluconate solution and isopropyl alcohol. Alcoholic chlorhexidine is an antiseptic solution usually indicated for antisepsis of the skin prior to surgery.

Chlorhexidine has been synthesised in 1950 during researches in the laboratory of ICI (Imperial Chemical Industries, UK). The molecule had an excellent antibacterial activity and a low toxicity and then has been developed as antiseptic. It was marketed in France in 1972 [1]. In 1920, Standard Oil first produced isopropyl alcohol by hydrating propene. The molecule was used combined with chlorhexidine as antiseptic before surgery in United States since the 1980's. It was marketed in France in 1987 [2].

Moreover, the second edition of European pharmacopoeia included a monograph for Chlorhexidine digluconate solution in 1990 and the Isopropyl alcohol was already included in 1999.

Nowadays, alcoholic chlorhexidine solutions are still currently used. In France, the “Vidal dictionary” lists more than 30 medicinal products in solution of chlorhexidine digluconate as active substance and 3 medicinal products that contain isopropyl alcohol as active substance for antiseptics.

Laboratoires Gilbert has a serious background in chlorhexidine-alcohol solution. Chlorhexidine is known as a highly potent and persistent antiseptic that works against gram-positive and gram-negative pathogens, fungi, and viruses, but does not have activity against spores. It remains active in the presence of organic material, is minimally absorbed, and does not cause skin irritation. Furthermore, chlorhexidine has been proven to be highly efficacious at reducing microbial load in numerous studies evaluating hand hygiene practices, IV catheter care, preoperative showers and baths, and skin preparation prior to surgery [3]. Ethyl alcohol, iso-propyl alcohol and *n*-propyl alcohol possess very good disinfectant properties in the range of 60–90% solutions with water. They are considered intermediate-level disinfectants, effective against vegetative bacteria, enveloped viruses, and some fungi and mycobacteria, including *M. tuberculosis*. Alcohols are believed to function by denaturing proteins, which is dependent on the relative amounts of alcohol and water [4].

Multiple clinical trials have demonstrated the efficacy of chlorhexidine in reducing bacterial colony counts in individuals admitted to the intensive care unit (ICU). In one 15-month study conducted in an Illinois teaching hospital, 1787 ICU patients were bathed or cleansed daily with either non-medicated cloths, soap and water-soaked cloths, or cloths saturated with 2% chlorhexidine, and then evaluated for acquisition of vancomycin-resistant *Enterococci* (VRE). Compared to non-medicated or soap and water baths, cleansing with chlorhexidine cloths produced significantly less VRE contamination on patients' skin, ICU workers' hands, and environmental surfaces [3].

Moreover, various randomized clinical trials have demonstrated the superiority of chlorhexidine-alcohol over povidone-iodine for preventing surgical-site infection after clean-contaminated surgery. In one-month study conducted in six university hospitals of United States, 849 patients were randomly assigned to have the skin at the surgical site either preoperatively scrubbed with an applicator that contained 2% chlorhexidine gluconate and or preoperatively scrubbed and then painted with an aqueous solution of 10 % povidone-iodine and then evaluated on the occurrence of any surgical-site infection within 30 days after surgery. Compared to the aqueous povidone-iodine the application of chlorhexidine-alcohol reduced the risk of surgical-site infection by 41 %. The superior clinical protection provided by chlorhexidine-alcohol is probably related to its more rapid action, persistent activity despite exposure to bodily fluids, and residual effect [5].

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In conclusion, based on an experience of more than 30 years, chlorhexidine digluconate in isopropanol solution has a well-established use with a good level of safety and efficacy for antisepsis of the skin prior to surgery.

### **Literature references**

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