HCAI Technology Innovation Programme
Showcase Hospitals report number 4
ChloraPrep® 2% Chlorhexidine Gluconate w/v
70% Isopropyl Alcohol v/v cutaneous solution for
skin antisepsis
The Healthcare Associated Infections (HCAI) Technology Innovation Programme: Showcase Hospitals Reports No.4: ChloraPrep 2% Chlorhexidine Gluconate w/v 70% Isopropyl Alcohol v/v cutaneous solution for skin antisepsis in selected Showcase Hospitals and includes a template business case for use in any trust considering using this product.

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The Healthcare Associated Infections (HCAI) Technology Innovation Programme

The basic ways of preventing and reducing healthcare associated infections (HCAIs) are largely unchanging. The principal strategies for combating HCAIs are those associated with hand hygiene/aseptic techniques, prudent antibiotic prescribing and good clinical practice. However, new technologies and equipment can support these strategies by helping get things done differently, more swiftly or more reliably.

As part of the strategy set out in *Clean, Safe Care*¹ the Department of Health is funding the HCAI Technology Innovation Programme². The Programme aims to:

- Speed up the development and adoption of technologies to further help combat HCAIs
- Identify which new technologies provide the best value and will have the most impact

The Showcase Hospitals Programme

In 2004 the Department of Health set up the Rapid Review Panel (RRP) to "provide a prompt assessment of new and novel equipment, materials and other products that may be of value to the NHS in improving hospital infection control and reducing hospital acquired infection". The RRP does not undertake any product trials itself but makes recommendations based on written evidence provided by industry.³ The highest recommendation (Recommendation 1) is:

Basic research and development, validation and recent in use evaluations have shown benefits that should be available to NHS bodies to include as appropriate in their cleaning, hygiene or infection control protocols.

As part of the HCAI Technology Innovation Programme, technologies which have gained a RRP Recommendation 1 are being placed in up to 7 Showcase Hospitals around the country for periods up to six months during which time a detailed evaluation of their in-use and economic features along with adoption characteristics is undertaken. Costs of the technologies are met centrally. The current Showcase Hospitals are The Royal Wolverhampton Hospitals NHS Trust, Imperial College Healthcare NHS Trust, Calderdale and Huddersfield NHS Foundation Trust, Southampton University Hospitals NHS Trust, County Durham and Darlington NHS Foundation Trust, The Lewisham Hospital NHS Trust and Central Manchester University Hospitals NHS Foundation Trust.

These are service evaluations, as defined by the National Patient Safety Agency’s National Research Ethics Service, and do not therefore require Research Ethics Committee review.⁴

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Acknowledgements

We would like to acknowledge the support of the NHS Purchasing and Supply Agency Centre for Evidence-based Purchasing and NHS National Technology Adoption Centre in the compilation of this report.
Showcase Hospitals report number 4

ChloraPrep® 2% Chlorhexidine Gluconate w/v 70% Isopropyl Alcohol v/v cutaneous solution for skin antisepsis

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Executive summary

The Department of Health has set up a Rapid Review Panel (RRP) to assess new and novel technologies and consider their potential for reducing hospital infections. As part of the Department’s Healthcare Associated Infections (HCAI) Technology Innovation Programme, technologies that have received an RRP1 recommendation (“basic research and development, validation and in-use evaluations have shown benefits that should be available to NHS bodies”) have been placed in selected Showcase Hospitals for review of their acceptability in everyday use and to gather information that may be useful for other hospitals.

ChloraPrep® is a sterile, single patient use skin antisepsis system. It contains a solution of 2% chlorhexidine gluconate w/v 70% Isopropyl Alcohol v/v within a glass ampoule which is itself contained within a plastic applicator. At the tip of the applicator is a sponge head. This combination is recommended by epic2[1] for cutaneous antisepsis when inserting venous catheters. ChloraPrep® is the only product of this kind currently available that has a marketing authorisation from the Medicines and Healthcare products Regulatory Agency (MHRA) for use on human skin prior to puncture or incision. ChloraPrep® was awarded Rapid Review Panel (RRP) recommendation 1 in 2005.

ChloraPrep® was used in seven Showcase Hospitals for three to six months for cutaneous antisepsis prior to the insertions of a vascular access device, renal dialysis catheter care and for collecting blood cultures. Staff opinions were favourable. The main concern was around cost. There were some adverse skin reactions (a known issue).

The showcase project demonstrated that ChloraPrep® can be safely implemented in NHS hospitals and that its use was popular with staff. A template business case has been produced.

Keywords: Hygiene monitoring, HCAI, ChloraPrep®, Rapid Review Panel
**Introduction**

This report sets out the findings from an evaluation in NHS Showcase Hospitals of the in-use and economic features and adoption characteristics of ChloraPrep® 2% Chlorhexidine Gluconate w/v 70% Isopropyl Alcohol v/v cutaneous solution for skin antisepsis.

The Rapid Review Panel which assesses new and novel products which may help infection prevention and control has concluded that basic research and development, validation and recent in use evaluations have shown benefits that should be available to NHS bodies to include as appropriate in their cleaning, hygiene or infection control protocols.

The objective of this document is to help Directors of Infection Prevention and Control and other stakeholders to decide whether they should consider ChloraPrep® as part of their trust’s strategy to reduce healthcare associated infections.

**The problem**

**Cutaneous antisepsis**

Microorganisms that colonise catheter hubs and the skin surrounding the central venous access device insertion site are the cause of most catheter related bacteraemias (bloodstream infections). These contaminate the catheter during insertion and migrate along the catheter track. The risk of infection increases with the density of microorganisms around the insertion site. Skin cleansing/antisepsis of the insertion site is therefore one of the most important measures for preventing catheter related infection[1].

**The product**

**ChloraPrep® 2% Chlorhexidine Gluconate w/v 70% Isopropyl Alcohol v/v cutaneous solution for skin antisepsis**

ChloraPrep® is a sterile, single patient use skin antisepsis system. It contains a solution of 2% chlorhexidine gluconate w/v 70% Isopropyl Alcohol v/v within a glass ampoule which is itself contained within a plastic applicator. At the tip of the applicator is a sponge.

There are three types of applicator.
SEPP – which contains 0.67ml of the solution and which is pinched before use until the inner ampoule breaks

FREPP – which contains 1.5ml of the solution and has two wings which are pinched together until the ampoule breaks

Other products containing 1.5ml, 3ml, 10.5ml and 26ml of the solution (the 1.5 ml size was not included in this evaluation) which either have wings or (for the 26ml a handle) which are squeezed to break the ampoule.

ChloraPrep® was awarded Rapid Review Panel (RRP) recommendation 1 in 2005. The panel concluded that ChloraPrep® was likely to support the reduction of central line associated bloodstream infections.
The knowledge base
What was known before this evaluation

Following a review of the scientific evidence, epic2: National Evidence-Based Guidelines for Preventing Healthcare-Associated Infections in NHS Hospitals in England[1] recommended the use of alcoholic chlorhexidine gluconate solution (preferably 2% chlorhexidine gluconate in 70% isopropyl alcohol) for cutaneous antisepsis (except in patients with chlorhexidine sensitivity) prior to the insertion of a central venous access device and to clean the catheter insertion site during dressing changes (except where the manufacturer’s recommendations prohibit the use of alcohol with their product, when an aqueous solution of chlorhexidine gluconate should be used).

ChloraPrep® is the only product containing the specified 2% chlorhexidine gluconate in 70% isopropyl alcohol solution currently available that has a marketing authorisation from the Medicines and Healthcare products Regulatory Agency (MHRA) for use on human skin prior to puncture or incision.

The use of 2% chlorhexidine gluconate in 70% isopropyl alcohol is also recommended as part of the Department of Health’s Saving Lives initiative[2]
  - For skin preparation prior to the insertion of a central venous catheter (High Impact Intervention No 1)
  - For skin preparation prior to the insertion of a peripheral intravenous cannula (High Impact Intervention No 2)
  - For skin preparation prior to the insertion of a renal dialysis catheter (High Impact Intervention No 3)
  - In a swab for disinfecting the skin prior to venepuncture for taking blood for culture (Taking blood cultures – a summary of best practice)

The evaluation
How the evaluation was done

As part of the Showcase Hospitals programme, ChloraPrep® was introduced for three to six months in selected NHS hospitals with the aim of evaluating its in-use features and adoption characteristics. The blood culture contamination rate was also analysed.

For the purposes of the Showcase Hospitals programme, the analysis of ChloraPrep® was restricted to cutaneous antisepsis prior to the insertion of a vascular access device, renal dialysis catheter care and for collecting blood cultures.

During the final stages of showcasing 50 staff at each Showcase Hospital who had routinely used ChloraPrep® were selected to participate in structured interviews and focus groups regarding their experiences.
Does the product reduce blood culture contamination?

Contamination of blood samples during the process of taking blood produces a significant level of false positive readings which complicates patient care. A false positive is defined as growth of bacteria in the blood culture bottle that were not present in the patient’s bloodstream and were introduced during sample collection. Contamination can come from a number of sources: the patient’s skin, the equipment used to take the sample and transfer it to the culture bottle, the hands of the person taking the blood sample, or the general environment.[2]

Data on blood culture contamination rates were collected by the Showcase Hospitals’ microbiology laboratories using coagulase-negative Staphylococci as the marker for contamination. These data were compared with retrospective data from the same time period during the previous two years.

Figure 1 shows the percentage contamination rates in the six months prior to the implementation of ChloraPrep® and the six months after the implementation of ChloraPrep®, together with linear trends. (One of the Showcase Hospitals has been excluded as ChloraPrep® was already in use at this hospital prior to the project.) Each Showcase Hospital implemented ChloraPrep® on a different date, so standardised months have been used. Overall, there was no discernible effect on blood culture contamination from the introduction of ChloraPrep®, though some hospitals did see a reduction.5

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As noted above, however, the patient’s skin is only one of a number of potential sources of contamination, and the blood culture contamination rates could have been affected by other factors. In a study undertaken by the National Blood Service\cite{3}, which measured bacteria present on donors’ arms pre and post disinfection, ChloraPrep® was found to be 10 times more effective than a wipe impregnated with isopropyl alcohol and 0.5% chlorhexidine acetate in disinfecting donor arms. In the light of this study, it was not felt necessary to measure skin contamination as part of this evaluation.

**How easy were the products to use?**

The majority of staff questioned used the ChloraPrep® range of products for peripheral venous cannulation and post insertion site care in place of the previously used wipes. A significant majority of those who responded found all the ChloraPrep® products to be easy to use (removal from packaging and activation was simple), were confident in their efficacy and would recommend the products to their NHS colleagues.

The larger sized products were shown to be even easier to use than the smaller sized SEPP product. Over 90% of staff found the larger sized products easy to activate compared with 83% of staff who found SEPP easy to activate. The larger sizes were also more likely to be recommended to colleagues.

The findings are summarised in Table 1. More detail is in the Annex.

<table>
<thead>
<tr>
<th></th>
<th>SEPP</th>
<th>FREPP</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin adequately decontaminated</td>
<td>93%</td>
<td>96%</td>
<td>96%</td>
</tr>
<tr>
<td>Easy to remove from packaging</td>
<td>78%</td>
<td>96%</td>
<td>97%</td>
</tr>
<tr>
<td>Easy to activate</td>
<td>83%</td>
<td>94%</td>
<td>93%</td>
</tr>
<tr>
<td>Speed of liquid flow onto sponge satisfactory</td>
<td>83%</td>
<td>83%</td>
<td>88%</td>
</tr>
<tr>
<td>Skin coverage adequate</td>
<td>92%</td>
<td>93%</td>
<td>95%</td>
</tr>
<tr>
<td>Drying time satisfactory</td>
<td>78%</td>
<td>80%</td>
<td>85%</td>
</tr>
<tr>
<td>Would recommend to colleagues</td>
<td>88%</td>
<td>93%</td>
<td>93%</td>
</tr>
<tr>
<td>Would like to continue to use product</td>
<td>88%</td>
<td>92%</td>
<td>94%</td>
</tr>
</tbody>
</table>

**Table 1 – Analysis of responses**

**What issues arose in relation to implementation and adoption?**

As the previous section shows, there was wide support for ChloraPrep®. There were, however, a variety of issues raised that led in some instances to ChloraPrep® not being used or individuals being reluctant to use the product.

Several Showcase hospitals reported **supplies** of ChloraPrep® running low or running out during the project which led staff to seek alternatives. Local NHS Supply Chain centres did not carry enough stock. The issues of stock control were resolved by working closer with the supply leads and by liaising directly with NHS Supply Chain.
At the time of the evaluation, ChloraPrep® did not form part of ready prepared cannula packs which most commonly contained pre-injection swabs, which contain 70% isopropyl alcohol alone.

In order to ensure that ChloraPrep® was made available to nurses and others caring for central lines at home a hospital pharmacy made up packs with ChloraPrep® added.

Two types of possible adverse skin reactions were reported to the MHRA.

Finally, whilst the product was provided at no cost for the evaluation, many staff appeared to have considerable concerns about the cost if this were to fall to the trust.

What did staff think of the product?

Staff were asked to give ChloraPrep® a score out of 10 for 31 different factors. Figure 2 shows the scores. High scores are always good. Eighty-five people took part in the survey and each red bar on the graph represents the average rating for a particular factor.
Figure 2 - User ratings of ChloraPrep®
Advice and tools for trusts considering introducing ChloraPrep®

Important points to consider

ChloraPrep® is the only product meeting the epic2 guidelines which has a marketing authorisation from the Medicines and Healthcare products Regulatory Agency (MHRA) for use on the skin prior to puncture or incision.

Costs and Benefits

Current (August 2009) prices from the NHS Supply Chain catalogue are

<table>
<thead>
<tr>
<th>Description</th>
<th>Price (£)</th>
<th>Discounted Price (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEPP (200 x 0.67 ml)</td>
<td>70.46</td>
<td>69.05 if ten or more packs are ordered</td>
</tr>
<tr>
<td>FREPP (20 x 1.5 ml)</td>
<td>13.17</td>
<td>12.92 if twenty five or more packs are ordered</td>
</tr>
<tr>
<td>25 x 3ml</td>
<td>24.62</td>
<td>24.14 if four or more packs are ordered</td>
</tr>
<tr>
<td>25 x 10.5ml</td>
<td>87.19</td>
<td>85.46 if four or more packs are ordered</td>
</tr>
<tr>
<td>25 x 26ml</td>
<td>195.25</td>
<td></td>
</tr>
</tbody>
</table>

The unit prices are therefore

<table>
<thead>
<tr>
<th>Description</th>
<th>Price (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEPP</td>
<td>35p</td>
</tr>
<tr>
<td>FREPP</td>
<td>66p</td>
</tr>
<tr>
<td>3ml</td>
<td>98p</td>
</tr>
<tr>
<td>10.5ml</td>
<td>3.49</td>
</tr>
<tr>
<td>26ml</td>
<td>7.81</td>
</tr>
</tbody>
</table>

Drawing up a Business Case

*Trusts may wish to adopt and adapt the following model when drawing up a business case for this product. Text in italics (other than the section headings) gives information about how to complete the business case. Text in ordinary font (and the section headings) is intended to be suitable for cutting and pasting into the business case. The symbol ♥indicates where numbers need to be inserted.*

The Problem

Intravenous devices are the most frequently implicated factor in hospital acquired bloodstream infections with MRSA and other pathogens. The national epci2 guidelines⁶ recommend a single patient use application of alcoholic chlorhexidine gluconate solution (preferably 2% chlorhexidine

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gluconate in 70% isopropyl alcohol) prior to the insertion of central venous catheters and for the routine cleaning of central venous catheter access sites. In addition, the DH *Saving Lives* programme of High Impact Interventions\textsuperscript{7} recommends this solution for all skin preparation prior to invasive procedures.

Regulations made under the Health and Social Care Act 2008\textsuperscript{8} require trusts to ensure as far as possible that patients are protected against identifiable risks of acquiring healthcare associated infections. The Code of Practice for the NHS on the prevention and control of healthcare associated infections\textsuperscript{9} sets out how the Care Quality Commission will assess compliance with the requirements set out in regulations and provides guidance on how trusts can meet the requirements. This states that trusts should have and adhere to appropriate policies and protocols for the prevention and control of healthcare associated infections, including aseptic technique.

**ChloraPrep®**

ChloraPrep\textsuperscript{®} is a sterile, single patient use skin antisepsis system. It contains 2% chlorhexidine gluconate w/v 70% Isopropyl Alcohol v/v within a glass ampoule which is itself contained within a plastic applicator. At the tip of the applicator is a sponge. It comes in a range of sizes.

ChloraPrep\textsuperscript{®} is the only product containing the specified 2% chlorhexidine gluconate in 70% isopropyl alcohol solution currently available that has a marketing authorisation from the Medicines and Healthcare products Regulatory Agency (MHRA) for use on human skin prior to puncture or incision.

ChloraPrep\textsuperscript{®} is recommended by the Rapid Review Panel (which assesses new and novel equipment, materials and other products that may be of value to the NHS in improving hospital infection control and reducing healthcare associated infections) as being a product where basic research and development, validation and recent in use evaluations have shown benefits that should be available to NHS bodies to include as appropriate in their cleaning, hygiene or infection control protocols.

In a study undertaken by the National Blood Service\textsuperscript{10}, which measured bacteria present on donors’ arms pre and post disinfection, ChloraPrep\textsuperscript{®} was found to be 10 times more effective than a wipe impregnated with isopropyl alcohol and 0.5% chlorhexidine acetate in disinfecting donor arms.


\textsuperscript{8} The Health and Social Care Act 2008 (Registration of Regulated Activities) Regulations 2009


A recent evaluation by Showcase Hospitals as part of the Department of Health’s Healthcare Associated Infections Technology Innovation Programme showed that ChloraPrep® was favourably received by staff.

**Current Practice**

*Describe current practice in your trust for cutaneous antisepsis for (a) central venous catheters (b) peripheral venous catheters (c) taking blood cultures*

**Options**

We have looked at 4 options

1. Continue with current practice, accepting that the trust has failed to comply with epic2 and Saving Lives. [The second part of this statement, and its equivalent in other options, assumes, of course, that current practice does not provide an alternative way of ensuring compliance with epic2 and Saving Lives, for example, by using alcoholic chlorhexidine gluconate solution which is made up locally and which therefore does not require a marketing authorisation. Any trust currently adopting this approach will need to draw up their own business case, based on factors such as relative cost, the results of the National Blood Service study, and the advantages of using a product which has a marketing authorisation rather than relying on making products up locally.]

2. Use ChloraPrep® for central venous catheters only, complying with epic2 guidelines but accepting that the trust has failed to comply with Saving Lives.

3. Use ChloraPrep® for central and peripheral venous catheters, complying with epic2 guidelines, and partially complying with Saving Lives.

4. Use ChloraPrep® for central and peripheral venous catheters and blood cultures, complying fully with epic2 guidelines and Saving Lives.

**Costs and Benefits**

We have looked at a range of parameters for each of the options, as follows

(a) Number of procedures
(b) Unit cost of existing method of cutaneous antisepsis
(c) Total cost of existing method of cutaneous antisepsis [(a)x(b)]
(d) Unit cost of ChloraPrep®
(e) Total cost of using ChloraPrep® [(a)x(d)]
(f) Additional cost of using ChloraPrep® [(e)-(c)]
(g) Number of bacteraemias (bloodstream infections) prior to introduction of ChloraPrep® [use local data – same number for all options]
(h) Cost per bacteraemia [an estimate of £4,300 per case may be appropriate\(^{11}\)]

(i) Total cost of bacteraemias prior to introduction of ChloraPrep\(^{®}\) [(g)x(h)]

(j) Estimated number of bacteraemias following introduction of ChloraPrep\(^{®}\) [This will vary between options. You will need to assess both what proportion of bacteraemias can be attributed to each type of procedure, and what proportion of these bacteraemias will be prevented]

(k) Estimated cost of bacteraemias following introduction of ChloraPrep\(^{®}\) [(j)x(h)]

(l) Savings in cost of bacteraemias following introduction of ChloraPrep\(^{®}\) [(i)-(k)]

(g) Costs/savings following introduction of ChloraPrep\(^{®}\) [(f)-(l)]

(h) Transitional costs [e.g. training; cost of any stock not used]

Other Benefits

Fewer false positive blood cultures (under Option 4) will reduce costs. Currently the trust’s blood culture contamination rate is ♥% [use local data] - around ♥ cultures [apply local percentage to number of blood cultures used in calculations for Option 4]. To process a negative blood culture costs approximately £♥, as opposed to £♥ to process a positive blood culture. This does not include the cost of unnecessary use of antibiotics, increased bed stay and consultation time.

Reducing the number of bacteraemias, which are associated with increased length of stay, will reduce blocked beds which may in turn help with delivery of other trust targets, such as waiting times.

Conclusions and Recommendation

Taking action to reduce bacteraemias is desirable in order to reduce harm to patients and increase confidence in the safety of the services provided by the trust. Failure to comply with epic2 and Saving Lives guidelines will be hard to justify, particularly where bacteraemias are found by Root Cause Analysis to be the result of inadequate cutaneous antisepsis.

However, these risks have to be balanced against the costs, and it is important to assess the level of risk associated with each type of procedure, and the degree of benefit which the use of ChloraPrep\(^{®}\) is likely to bring.

Our recommendation is to be decided locally

 Annex – More detailed findings on the products in the ChloraPrep® range

SEPP

SEPP was made available at 5 of the participating 7 Showcase Hospitals. 89% of staff who responded to the questionnaire reported that they had used this product, with the majority of uses being for peripheral venous cannulation. Other uses included post insertion site care, arterial cannulation, venepuncture and taking blood cultures.

93% of staff who expressed an opinion felt confident that the skin had been adequately decontaminated.
78% of staff who expressed an opinion thought that the SEPP product was easy to remove from its packaging. 83% found it easy to activate and that the product flowed at a satisfactory speed onto the sponge.
92% of staff who expressed an opinion agreed or strongly agreed that the area of skin coverage was adequate from the product and 78% felt that the drying time was satisfactory.

### The area of skin that can be covered is adequate

<table>
<thead>
<tr>
<th>Percentage of Respondents</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>25%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>68%</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3%</td>
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### The drying time is satisfactory (not too long)

<table>
<thead>
<tr>
<th>Percentage of Respondents</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>16%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>62%</td>
<td></td>
<td></td>
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<tr>
<td>20%</td>
<td></td>
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<td></td>
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<tr>
<td>2%</td>
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</table>
88% of staff who expressed an opinion would recommend this product to a colleague and would like to continue to use the product.

**I would recommend SEPP to other colleagues**

- **Strongly Agree**: 27%
- **Agree**: 61%
- **Disagree**: 6%
- **Strongly Disagree**: 5%

**I would like to continue to use SEPP in my clinical setting**

- **Strongly Agree**: 27%
- **Agree**: 61%
- **Disagree**: 7%
- **Strongly Disagree**: 4%
FREPP

FREPP was made available at all 7 Showcase Hospitals. 79% of staff who responded to the questionnaire indicated they had used this product with just over a third of uses being for blood cultures and just under a third for peripheral venous cannulation. It was also used for central venous line insertion, post insertion site care and arterial cannulation.

96% of staff who expressed an opinion felt confident that the skin had been adequately decontaminated.
96% of staff who expressed an opinion thought that the FREPP product was easy to remove from its packaging. 94% found it easy to activate and 83% thought that the product flowed at a satisfactory speed onto the sponge.
93% of staff who expressed an opinion agreed or strongly agreed that the area of skin coverage was adequate from the product and 80% felt that the drying time was satisfactory.
93% of staff who expressed an opinion would recommend this product to a colleague and 92% would like to continue to use the product.
Other

Three other ChloraPrep® products were included in this evaluation in 3ml, 10.5ml and 26ml sizes. Each of these 3 products is used in the same way. 94% of staff had access to the 3ml size, with around a third having access to the 10.5ml size and about one in eight access to the 26ml size. No distinction was made between the sizes in the feedback.

82% of staff who responded to the questionnaire had used one or more of these products. Around a quarter of uses were for post insertion site care, with the products also being used for central venous line insertion, peripheral venous cannulation, arterial cannulation and blood cultures, with a small proportion of uses being for surgical procedures.

96% of staff who expressed an opinion felt confident that the skin had been adequately decontaminated.
97% of staff who expressed an opinion thought that the product was easy to remove from its packaging. 93% found it easy to activate and 88% considered that the product flowed at a satisfactory speed onto the sponge.
95% of staff who expressed an opinion agreed or strongly agreed that the area of skin coverage was adequate from the product and 85% felt that the drying time was satisfactory.
93% of staff who expressed an opinion would recommend these products to a colleague and 94% would like to continue to use the products.

![Bar chart showing the percentage of respondents who would recommend the products to colleagues and who would like to continue using them in their clinical setting.](image-url)
References

