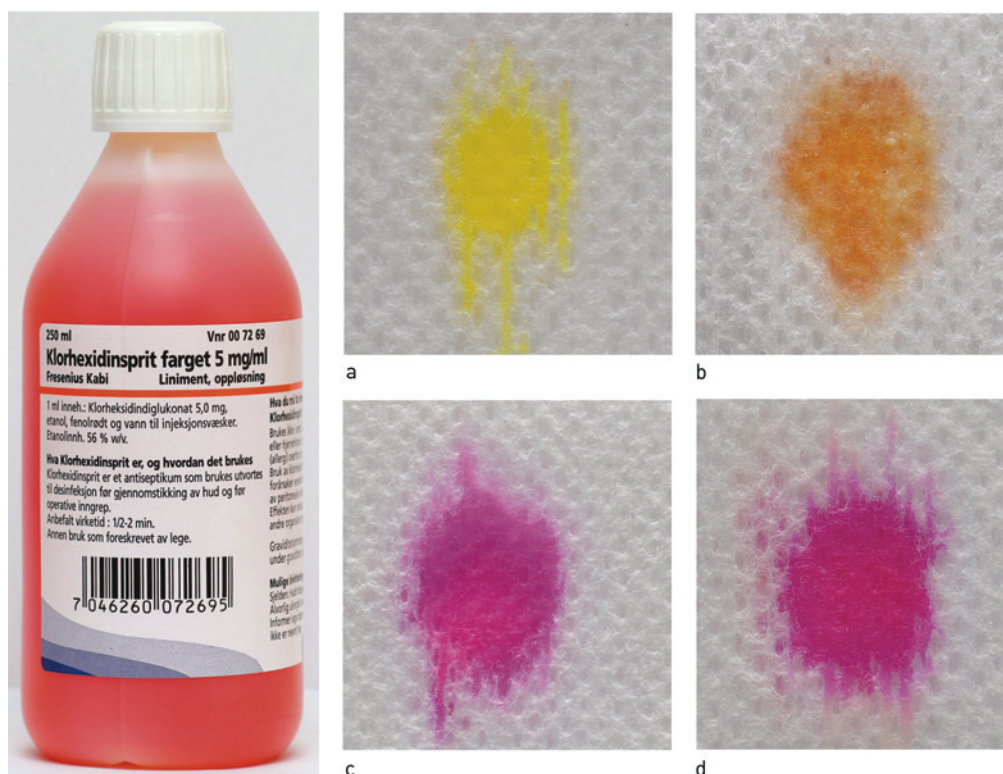


Detection of cerebrospinal fluid leakage with tinted chlorhexidine



Simple, fast detection of cerebrospinal fluid leakage due to head injuries is important for diagnosis and early start-up of correct treatment. We are not aware of any good, rapid diagnostic tests for detecting cerebrospinal fluid. Measuring sugar concentration and protein content normally yields uncertain results. At the University Hospital of North Norway in Tromsø, tinted chlorhexidine has been used for years to detect cerebrospinal fluid, with good results. The technique is very simple and inexpensive, and we believe it deserves to be better known among the medical community.

Cerebrospinal fluid that has been in contact with air has a pH value of 7.8–8.1. This distinguishes it from blood, mucous and saliva, which have a lower pH, typically 7.2–7.48 (1). Tinted chlorhexidine for disinfecting skin is present in all hospitals and medical centres in Norway. The pale yellow colour is due to phenol red, which the manufacturer adds to the colourless chlorhexidine solution, presumably to make it easier to see which parts of the skin have been disinfected. Phenol red is also a pH indicator, however. The pale yellow colour turns into an intense

purple at a pH value of around 8. Weakly alkaline fluids, such as saliva, cause a very different change of colour to reddish brown.

Cerebrospinal fluid that leaks from the nose or ear in connection with head injuries is often mixed with blood, but the amount of blood is usually limited. Adding blood to cerebrospinal fluid until a concentration of 1 g haemoglobin/100 ml of solution is attained still results in a very distinct colour change to reddish purple.

The image shows tinted chlorhexidine solution on a compress (a), and the colour change after adding saliva (b), cerebrospinal fluid (c) and cerebrospinal fluid mixed with a 1 % blood solution (d).

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