

SAFE USE OF 10% POTASSIUM HYDROXIDE IN SCREENING FOR SEXUALLY TRANSMITTED INFECTIONS

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BACKGROUND

The Clinical Prevention Services at the BC Centre for Disease Control (BCCDC) are the developers of STI decision support tools (DST) which are used province-wide by nurses who are providing STI clinical care. The BCCDC has developed the bacterial vaginosis (BV) DST for the purpose of diagnosing and treating BV.

The potassium hydroxide “whiff” test is used in the clinical diagnosis of BV. Performing the “whiff” test involves placing 0.25 to 0.5 mL of 10% potassium hydroxide onto a slide. Vaginal secretions are collected onto a swab which is then dipped into the solution on the slide and the mixture is tested for amine odour.

Concern has been raised because WHMIS classifies solid potassium hydroxide as “very toxic”.

INFORMATION ABOUT POTASSIUM HYDROXIDE (KOH)

Aqueous solutions of KOH are colourless and odourless. KOH is an alkaline corrosive: pH of a 0.1M solution (0.5%) is 13.5. A 50% solution has a boiling point of 143.3°C, vapour pressure of 27 mmHg at 60°C.¹

The Workplace Hazardous Material Information System (WHMIS) classifies 10% potassium hydroxide (KOH) as “Class E – Corrosive Material”¹, which is different from the Classification of solid KOH, which is classified as both “Class E and Class D1B – Toxic Material Causing Immediate and Serious Toxic Effect”.²

The Class E classification for aqueous potassium hydroxide relates to the caustic nature of the chemical, rather than any inherent metabolic toxicity. When evaluating the toxicity of a substance consideration is given to its physical properties and whether the substance is known to produce adverse metabolic effects following system absorption. In individual cases, toxicity must be evaluated based on the nature and the route of the exposure, the dose, the length of the exposure.

Dermal exposure to aqueous KOH would be expected to cause a burn to the skin, the severity of which would depend on the concentration of the solution and the length of time the skin was exposed. The same could be said for ocular exposure. Similarly, ingestion of aqueous KOH would be expected to cause burns to the oropharynx and tissues of the upper gastrointestinal tract, the severity of which would depend on the concentration of the solution and amount ingested. Inhalation of higher concentrations for extended periods would be expected to cause irritation to the upper respiratory tract, characterized by nasal discharge, coughing and wheezing. Systemic exposure to potassium hydroxide is not expected to cause direct toxicity or adverse metabolic effects.³

Literature suggests that KOH has a negligible vapour pressure and is rapidly neutralized in air by carbon dioxide therefore aerosols of KOH are not stable, and inhalation of KOH vapour is unlikely.⁴

USING 10% POTASSIUM HYDROXIDE IN CLINICAL SETTINGS

For the potassium hydroxide “whiff” test, staff are expected to briefly sniff (for approximately 1-2 seconds) room temperature vapours from 0.25 to 0.5 mL of a 10% solution. The official exposure limit for KOH is 2 mg/m³ (this is a ceiling limit – not to be exceeded at any time, no duration specified). Given a negligible vapour pressure for aqueous KOH, it is unlikely that exposure limits would be exceeded, especially given that the test has been used for a number of years in many jurisdictions and there is no evidence of harm. More of a concern may come from inadvertent exposure to the skin or eyes either by touching the solution or spilling it. Exposure may be minimized by wearing gloves and taking care to avoid contact with facial skin, eyes, or nasal passages.

One resource suggests cautions to minimize possible adverse local effects to skin or nasal passages:⁵

Holding the slide or swab, gently fan the vapour layer (whiff) above the surface of the slide or swab and assess for the presence of volatile amines which have a fishy odour. NOTE: to prevent possible injury, caution should be taken to not to place the slide or swab close to the face directly under the nose.

SUMMARY

The potassium hydroxide “whiff” test is used to screen for bacterial vaginosis. This involves briefly sniffing room temperature vapours from a small volume of a 10% aqueous potassium hydroxide solution. While there are no formal studies in this setting, brief exposures of this nature are not expected to exceed official ceiling limits. Systemic toxicity is not expected. Appropriate precautions and Safe Work Procedures should be exercised to minimize local effects to skin, eyes, or nasal passages.

Please note that BC Centre for Disease Control does not endorse the use of 10% KOH in clinical settings without an independent quality control measure in place. BCCDC does not assume any liability associated with use of 10% KOH. This statement is intended as a guideline and the use of 10% KOH in clinical settings must be under the direction of a licensed health care professional and with appropriate quality and safety measures in place.

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