Lack of effect on evidential breath alcohol analysis with blood in the oral cavity.

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Abstract
Blood in the oral cavity during a breath alcohol analysis has been asserted to be a potential cause of falsely high blood alcohol concentration (BAC) readings by defense lawyers. The defense argues that the blood from oral trauma decreases the reliability of breath alcohol analysers even with the slightest (<2 ml) volume of blood in the mouth. In the current report we provide actual field evidence demonstrating blood in the oral cavity has no effect on BAC measurements by breath alcohol analysers.

Introduction
In the field of forensic toxicology the reliability of breath alcohol testing is perennially being challenged by defense lawyers for variety of reasons, most of which are quite implausible. One of the recent challenges has been that blood in the oral cavity can significantly elevate the breath alcohol measurement. It is argued that since blood alcohol concentration is >2000 times more concentrated than in the breath, blood in the oral cavity could act to orally increase alcohol vapor pressure and consequently the level of alcohol measured from the breath. However, in recent controlled study of measured breath alcohol level in subjects with aqueous alcohol solutions in the oral cavity(1), or alcohol containing mouthwashes(2), no significant alteration was produced in the measured BAC (blood alcohol concentration). Solutions of up to 0.15% ethanol in distilled water, or mouthwashes with up to 29.6% alcohol consistently caused changes of less than 0.01 in the measured BAC obtained by a breath alcohol analyser. Although this evidence is quite convincing from the empirical standpoint it could still be argued that the unique properties of blood render it better able to volatilize alcohol dissolved in it. The subject in this case report is the first actual field case documented to show the lack of effect of oral cavity blood on BAC measured by breath alcohol analyser.

Methods
The subject was arrested for driving under the influence (DUI) after crashing their vehicle into a stationary object. The oral cavity had minor cuts (<0.2 cm laceration) secondary to the crash and a small amount of blood. Breath samples were obtained for
alcohol analysis. Since there was blood in the oral cavity, a venous blood sample was also obtained four minutes later to confirm the validity of the breath alcohol study. Breath alcohol analysis was performed on an intoxilyzer 5000(CMI Inc., Owensboro, KY)infrared analyzer. Blood alcohol analysis was via headspace gas chromatography. Both these represent the standard criterion in forensic analysis of human biological specimens for alcohol quantification(3).

Results
The measured breath alcohol levels were; 0.204 and 0.218 g/210 L while the venous blood sample, drawn 4 minutes after the second breath alcohol measurement, demonstrated a blood alcohol level of 0.260% g/100 ml.

Discussion
Because of the difficulty of having subjects consent to hold blood (obtained from them after they had achieved a significant BAC) in their mouth while being subjected to breath alcohol analysis, this type of study has not been performed. As long as this is the case the possibility that blood in the oral cavity can falsely elevate measured breath alcohol level will continue to be asserted. Our findings provide direct field evidence that using a standard field alcohol breath analyser the presence of blood in the oral cavity caused no effect on the alcohol level measured.

References
