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# Resuscitation

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## Letter to the Editor

# Blood in the airway and bystander cardiopulmonary resuscitation



Dear Sir,

Current cardiopulmonary resuscitation (CPR) guidelines<sup>1</sup> endorse that all CPR providers should perform chest compressions for all patients in cardiac arrest and those trained and able to perform rescue breaths should perform chest compressions and rescue breaths. They also explained that the risk of disease transmission during CPR is extremely low, because the risk of transmission from the saliva during rescue breaths is very low.<sup>2</sup>

In February 2015, the Spanish local newspaper “La Voz de Galicia”<sup>3</sup> published that “Two Police officers are being treated after delivering mouth to mouth resuscitation to an HIV infected victim”, and it was later explained that “there was abundant blood in the victim’s airway”.

After that news, research was carried out by revising the computerized medical records of the Emergency Medical System FPUS 061 Galicia (Spain) to investigate the incidence of macroscopically visible blood in out-of-hospital cardiac arrest (OHCA) victims upper airway. 1,862 OHCA registers were studied and blood was found in 101 (5.42%) of them. Visible blood was reported in 38.75% of cases resulting from traumatic injuries, 5.76% from drowning and 3.99% from cardiac causes (Table 1).

Although pathogens can be isolated from the saliva of infected persons, salivary transmission of bloodborne virus is unusual (no cases of HIV, HBV or HCV infection transmitted by mouth-to-mouth resuscitation have been documented), the risk of acquiring HIV being between 1 in one million and 1 in one billion.<sup>2,4</sup> The presence of blood in the airway should be considered a mucous membrane exposure and the risk of HIV transmission after exposure to HIV-infected blood has been estimated to be approximately 0.09%.<sup>4</sup> But in the mouth-to-mouth

resuscitation with a 30:2 ratio, 10 exposures every 2 min are expected. This situation might increase the risk due to the prolonged contact.

What should be done if blood is detected by the bystander or visualized by the healthcare providers during airway management?

According to the guidelines for the management of occupational exposure,<sup>4</sup> the bystanders should be considered as health care personnel (“the term refers to all paid and unpaid persons working in healthcare settings” . . . “and persons not directly involved in patient care but potentially exposed to blood”), and the exposure considered a contact with mucous membrane. Clinicians should consider occupational exposures as urgent medical concerns: mucous membrane should be flushed with water,<sup>2</sup> the HIV status of the exposure source patient should be determined if possible to guide the need for HIV post-exposure prophylaxis (PEP), and PEP should be started as soon as possible.<sup>2,4</sup> All these measures are difficult to perform in stressful situations outside hospital, and even in cases of unsuccessful CPR blood specimens being obtained from a cadaver.<sup>2</sup>

The national health authorities<sup>2,4</sup> should emphasize the importance of primary prevention strategies and make institutional mechanisms and procedures available for reporting such cases and seeking care. If these procedures cannot be guaranteed, hands only CPR should be considered, at least in special groups like first responders (police officers) and in children who have not yet attained majority.<sup>5</sup>

## Conflict of interest statement

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**Table 1 – Some of the most likely primary out-of-hospital cardiac arrest causes and percentages of blood in the victim’s upper airways detected during advanced airway management.**

Primary cause	OHCA (n)	Blood detected (n)	%
All causes	1862	101	5.42
Cardiac total	1476	59	3.99
Presumed and diagnosed	989	29	2.93
No obvious cause	487	30	6.16
Traumatic	80	31	38.75
Drowning	52	3	5.76
Drug overdose	18	1	3.87

Gabina Pérez López do not have any financial and personal relationships with other people or organisations that could inappropriately influence (bias) their work.

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