Received: 9 March 2025 | Revised: 14 April 2025 | Accepted: 15 April 2025

DOI: 10.1111/acem.70060

Academic Emergency Medicine

RESEARCH LETTER

Combined screening of human immunodeficiency virus, hepatitis B virus, and hepatitis C virus in an emergency department: The URDEPTRIO cross-sectional study

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Emergency departments (EDs) are essential access points for the diagnosis of infectious diseases, yet routine screening for human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) remains underutilized.[1] EDs are frontline health care settings that serve diverse populations, including those at higher risk of exposure to sexually transmitted infections. EDs provide a unique opportunity to screen patients who may not routinely engage with health care services, capturing individuals at high risk for undiagnosed infections. Many individuals seen in the ED do not have regular access to primary care, leading to missed opportunities for screening in traditional health care settings.[2] By implementing opt-out screening, EDs can serve as a critical-access point for identifying undiagnosed cases and linking patients to appropriate care. Integrating a combined HIV, HBV, and HCV screening protocol into the ED workflow may increase their detection, in particular in people who might not otherwise seek specialized care. A proactive approach in EDs may enable timely diagnosis and treatment, thereby reducing the risk of transmission within the community and mitigating long-term health consequences. In addition, by identifying cases earlier, we could prevent complications and secondary infections, ultimately improving patient outcomes and reducing health care costs.

To assess the feasibility and impact of an opt-out screening strategy, we conducted a prospective cross-sectional study in a university hospital ED in Paris between May 2018 and November 2022. Patients aged 18 years or older, as well as minors with consent from a legal representative who required blood draws for clinical care, were

This study was approved by the ethics committee of Nîmes University Hospital (on October 2, 2023, N°IRB 23.02.06). Patients provided oral consent to participate in the study.

Supervising Editor: Beau Abar

TABLE 1 Characteristics of patients testing positive according to viral infection. The independent groups correspond to each infection type: HIV vs. HBV/HCV; HBV vs. HIV/HCV; and HCV vs. HIV/HBV.

Characteristic	Overall ($N = 394$)[a]	HBV ($n = 131$)[a]	HCV ($n = 142$)[a]	HIV ($n = 121$)[a]	p-value[b]
Sex worker	11 (2.8)	1 (0.8)	1 (0.7)	9 (7.4)	0.001
MSM	49 (12)	6 (4.6)	3 (2.1)	40 (33)	<0.001
Recent travel	125 (32)	50 (38)	36 (25)	39 (32)	0.075
Condomless sexual intercourse	77 (20)	17 (13)	9 (6.3)	51 (42)	<0.001
Intravenous drug user	35 (8.9)	2 (1.5)	30 (21)	3 (2.5)	<0.001
PrEP	4 (1.0)	0 (0)	2 (1.4)	2 (1.7)	0.5
Medical reason for the visit	363 (92)	120 (92)	128 (90)	115 (95)	0.3
High blood pressure	81 (21)	21 (16)	30 (21)	30 (25)	0.2
Diabetes	36 (9.1)	13 (9.9)	16 (11)	7 (5.8)	0.3
Chronic renal failure	29 (7.4)	7 (5.3)	10 (7.0)	12 (9.9)	0.4
Chronic bronchitis	6 (1.5)	2 (1.5)	3 (2.1)	1 (0.8)	0.9
Stroke	16 (4.1)	4 (3.1)	9 (6.3)	3 (2.5)	0.3
Febrile rash	26 (6.6)	3 (2.3)	7 (4.9)	16 (13)	0.001
Shingles	15 (3.8)	0 (0)	1 (0.7)	14 (12)	<0.001
Tuberculosis	36 (9.2)	10 (7.6)	9 (6.4)	17 (14)	0.076
STI	51 (13)	5 (3.8)	6 (4.2)	40 (33)	<0.001
Herpes	12 (3.0)	1 (0.8)	2 (1.4)	9 (7.4)	0.006
Infectious disease visit	184 (47)	50 (38)	35 (25)	99 (82)	<0.001

Abbreviations: MSM, men who have sex with men; PrEP, preexposure prophylaxis, STI, sexually transmitted infections.

[a]*n* (%); median (IQR).

[b]Fisher's exact test; Pearson's chi-square test.

systematically offered opt-out screening for HIV, HBV, and HCV. ED staff underwent training to communicate the screening process effectively to patients who were tested unless they actively declined participation. Screening was integrated into routine blood sampling, and results were recorded in the hospital's electronic medical record system (Orbis and Nadis).

Over the study period, 367,717 patients attended the ED, of whom 69,866 (19%) had blood samples drawn. Among these, 5322 patients (7.6%) were included in the study. A total of 413 individuals tested positive for at least one infection: 137 (2.57%) for HIV, 143 (2.69%) for HBV, and 152 (2.86%) for HCV. Of those with positive results, 51.1% of HIV cases, 65.7% of HBV cases, and 46.7% of HCV cases were newly diagnosed. Linkage to care was achieved for 100% of newly diagnosed HIV patients, 91% of HBV cases, and 96% of HCV cases (Table 1).

Despite concerns about workflow disruption, screening did not negatively impact ED efficiency. A comparison of performance before and after the implementation of the screening program shows a reduction in the median delay before being seen by an emergency physician (from 60 to 53 min, $p < 0.05$), and the overall length of stay remained stable, suggesting that integrating screening into routine practice is feasible. The 7.6% participation rate reflects several factors: patient inability to consent (psychiatric/cognitive issues), language barriers, rare refusals (<1%), and occasional omission by physicians due to clinical urgency or workload.

Our findings reinforce previous research on the feasibility of ED-based screening programs.[3–6] We found an overall positive rate of 413/5322 (7%) for at least one of the three tested viruses. Of these, 137 tested positive for HIV, translating to an estimated prevalence of 2.57%. This prevalence is more than 10-fold higher than the national and regional positivity rates (1.6 and 2.7 positive tests per 1000 tests, respectively).[7] This screening program identified 63 cases of advanced HIV infection (CD4 <200 cells/mm^3), reflecting delayed diagnoses likely due to missed opportunities for earlier testing. Importantly, seven primary HIV infections were also identified. Early identification of primary HIV in the ED is critical to interrupt transmission chains and initiate prompt antiretroviral therapy. Diagnosing HIV at the earliest stage allows for prompt antiretroviral therapy, which can significantly reduce viral load and transmission rates. Moreover, early detection improves individual prognosis, as it helps prevent progression to advanced stages, reduces morbidity, and lowers the risk of opportunistic infections.[8] We also identified seven primary HIV infections in our population, demonstrating that screening in the ED can be a complementary and powerful tool to halt HIV transmission dynamics. Additionally, 143 patients had a positive HBs antigen, indicating an active HBV infection and a high risk of transmission. This translated to an estimated prevalence of 2.69%. Regarding HCV, 152 patients had positive tests for HCV antibodies, with an estimated prevalence of 2.86%. HCV viral load was performed in all patients and was positive in 92 patients, indicating

a prevalence of active HCV infections of 60%. These patients may be contagious and, above all, require antiviral treatment. The prevalence of HBsAg (2.69%) and anti-HCV antibodies (2.86%) observed in our cohort was substantially higher than the national positivity rates reported in 2021 across French clinical laboratories, which were 0.69% and 0.67%, respectively.[7]

Given that a significant proportion of infections were previously undiagnosed, ED screening provides an essential opportunity for early detection and linkage to care. The high rates of follow-up care indicate that opt-out screening strategies can bridge gaps in patient access to infectious disease treatment.

Challenges included contacting and ensuring follow-up for positive cases and managing staff workload. However, close collaboration with infectious disease specialists facilitated timely referrals and improved care continuity. The study was conducted in a high-prevalence area with many vulnerable populations, possibly explaining the higher infection rates observed. Additionally, we did not assess the cost-effectiveness of the screening strategy nor did we collect feedback from health care providers and patients on its acceptability.

Routine opt-out screening for HIV, HBV, and HCV should be considered standard practice in high-prevalence EDs. Future studies should assess cost-effectiveness and scalability to inform national policies.

AUTHOR CONTRIBUTIONS

Original draft: Donia Bouzid and Chris Wong. Review and editing: Karen Champenois, Donia Bouzid, Quentin Le Hingrat, and Jade Ghosn. Conceptualization: Donia Bouzid, Enrique Casalino, and Paul Loubet. Investigation: Chris Wong, Enrique Casalino, Christophe Choquet, Vincent Mackiewicz, Florence Damond, Lucile Larrouy, Dan Pospai, and Jade Ghosn. Methodology: Florian Salipante and Judith Leblanc. Formal analysis: Florian Salipante. Project administration: Jade Ghosn and Enrique Casalino.

ACKNOWLEDGMENTS

The authors thank all the emergency department staff at Bichat Claude Bernard Hospital, all the virology laboratory staff, and also Odile Laurent for her constant help.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

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How to cite this article: Wong C, Le Hingrat Q, Salipante F, et al. Combined screening of human immunodeficiency virus, hepatitis B virus, and hepatitis C virus in an emergency department: The URDEPTRIO cross-sectional study. *Acad Emerg Med*. 2025;32:1027-1029. doi:10.1111/acem.70060