

Sexually Transmitted and Blood-borne Infections (STBBI) Testing and Linkages to Care: Reaching the Undiagnosed

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Point of Care Testing for Sexually Transmitted and Blood-Borne Infections

A CANADIAN REALIST REVIEW

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I would like to acknowledge that we are on the traditional and unceded territory of the Algonquin nation.

Aim of this realist review

- What are the enablers and barriers to implementing point of care STBBI testing for populations most affected?
 - What works for whom, when and under what circumstances?
 - What can Canada learn from other countries that have integrated STBBI POCT more broadly?
 - What can Canada learn for public health settings?
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Methods

- Comprehensive search of literature was conducted July 25, 2018.
- Titles and abstracts (n=2,713) were screened for eligibility.
 - 158 papers were included: 106 full papers and 52 abstracts

Our focus on outcomes

- a) Patient-centred
- b) Feasibility
- c) Impact



Key Populations

- GBMSM
- Indigenous communities
- Transgender people
- People who use drugs
- People in unstable housing
- Currently and recently incarcerated populations
- Immigrants and Refugees
- Pregnant women
- Sex workers and their clients
- Young people

Key Considerations according to population

- STBBI POCT can be effective to reach first time testers in all populations, to increase testing frequency, to achieve earlier detection, and to reach people who are more difficult to reach for testing.
- There is no relevant Canadian research regarding STBBI POCT use in Indigenous communities, but studies from Brazil and Australia show POCT is feasible in rural and remote Indigenous communities that may otherwise face barriers.
- There is no relevant Canadian research regarding STBBI POCT and transgender people.
- Offering STBBI POCT through trained peer facilitators, nurses and outreach workers, and in non-conventional settings, may be preferred in order to improve access and linkage to services.
- GBMSM often express a preference to access of rapid POCT over conventional serology and may be more likely to seek it out, however are more confident in conventional tests.

Considerations according to population

- Relatively low rates of engagement in care for PWID, people with unstable housing, and youth. Linkage to care requires careful planning.
- Using cultural mediators can help with outreach and overcome linguistic barriers for immigrants and refugees.
- Strategies for overcoming discomfort discussing sexual behaviour should be explored, including the use of electronic questionnaires. Language barriers should also be considered.
- STBBI POCT can be particularly important for pregnant women who have not received prenatal care.
- The inability of some POCTs to distinguish between past, treated infections and active cases should be weighed against the ability to offer same-day results and immediate treatment.
- Education about the reliability of STBBI POCT compared to conventional testing and considerations should be taken into account when implementing POCT programs.

Key Considerations according to setting

- Outreach settings
- Community and STI clinics
- Emergency departments
- Hospitals
- Pharmacies
- Non-conventional testing sites

Considerations for the Canadian context according to setting

- Offering POCT through all considered settings is feasible, acceptable and can detect previously undiagnosed, first-time testers, and individuals who would not normally be reached. It can help overcome the stigma associated with STBBI services.
- Ensuring linkage to treatment and care can be challenging when offering POCT at outreach venues.
- Using trained peers is an effective way of identifying appropriate outreach venues and complementary services, including ensuring linkage to care.
- Building strong commitments and partnerships with local organizations will facilitate buy-in and linkage to related prevention and support services.

Considerations for the Canadian context

- Those at highest risk for HIV appear to have high acceptance of HIV POCT, and rates of linkage to care and viral suppression are comparable to conventional testing.
- A high proportion of people diagnosed for HIV in EDs are advanced and represent missed opportunities for earlier diagnosis. EDs can reach communities that otherwise might be missed and can achieve higher rates of patients receiving their test results.
- Offering STBBI POCT within hospital settings, particularly when embedded within “normalized” care, may be an effective way to address missed opportunities.
- The combination of STBBI tests can influence acceptability and uptake, especially in contexts of high HIV-related stigma.

General considerations for the Canadian context

- Conventional testing and POCT are complementary testing strategies.
 - Some populations and some specific STBBI require conventional testing to detect early infections and for confirmatory testing.
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Program Science

Where programs drive scientific inquiry

Promising projects need to be coupled to well planned operational research and evaluation

Spheres of Knowledge	Spheres of Practice	Intended Outcomes
<ul style="list-style-type: none"> ● Epidemiology ● Transmission dynamics ● Policy analysis 	<p>Strategic Planning</p>	<ul style="list-style-type: none"> ● Define prevention objectives ● Prioritize the right populations ● Match strategy to epidemic phase
<ul style="list-style-type: none"> ● Efficacy / effectiveness ● Operations research 	<p>Program Implementation</p>	<ul style="list-style-type: none"> ● Select the intervention mix ● Implement interventions effectively
<ul style="list-style-type: none"> ● Surveillance ● Monitoring/evaluation ● Operations research ● Health systems research 	<p>Program Management</p>	<ul style="list-style-type: none"> ● Achieve high coverage ● Maximize efficiency ● Alter programs when appropriate

Figure 1. Overview of the interface between programmed practice and scientific domains. Blanchard & Aral. Sex Transm Infect February 2011 Vol 87 No 1. p.2

Conclusion

- Careful planning of STBBI POCT is critical to success
 - It is imperative to plan evaluation of POCT testing modalities for specific populations
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REVIEW is available at:**

<https://nccid.ca/publications/point-of-care-testing-1/>

Bibliography

1. Public Health Agency of Canada. Accelerating our Response: Government of Canada Five-Year Action Plan on Sexually Transmitted and Blood-borne Infections. Ottawa, Canada; 2019.
2. Public Health Agency of Canada. Summary: Estimates of HIV incidence, prevalence and Canada's progress on meeting the 90-90-90 HIV targets, 2016 - Canada.ca. Ottawa, Canada; 2018.
3. Ha S, Totten S, Pogany L, Wu J, Gale-Rowe M. Hepatitis C in Canada and the importance of risk-based screening. *Can Commun Dis Rep*. 2016 Mar 3;42(3):57–62.
4. Public Health Agency of Canada. Report on Sexually Transmitted Infections in Canada: 2013-2014. Ottawa, Canada; 2017.
5. Smallwood M. Reaching Underserved Populations: Leveraging Point-of-Care Tests for Sexually Transmitted and Blood-borne Infections to Explore New Program Options in Canada. National Collaborating Centre for Infectious Diseases: Winnipeg, MB; 2018.
6. Pawson R, Greenhalgh T, Harvey G, Walshe K. Realist review – a new method of systematic review designed for complex policy interventions. *J Health Serv Res Policy*. 2005;10(suppl 1):21–34.
7. Rycroft-Malone J, McCormack B, Hutchinson AM, DeCorby K, Bucknall TK, Kent B, et al. Realist synthesis: illustrating the method for implementation research. *Implement Sci*. 2012;7(1):33.
8. Pindera C, Becker M, Kasper K, Carnochan T, Sorensen T, Migliardi P. Evaluating the feasibility of point of care testing in Manitoba.; *Can J Infect Dis Med Microbiol*. 2010. 21(3):68B-69B.
9. Gardner S, Campbell D, Light L, Adam BD, Gliberman JM, Major C, et al. "Get on it" MSM testing blitz: HIV test results. *Can J Infect Dis Med Microbiol*. 2013;24:91A.
10. Thomas R, Machouf N, Trottier B, Vezina S, O'Brien R, Milne M, et al. A new approach to encourage HIV testing in high-risk populations at the clinique l'actuel. *Sex Transm Infect*. 2011;87:A201.
11. Engler K, Rollet K, Lessard D, Thomas R, Lebouche B. Ability of a rapid HIV testing site to attract and test vulnerable populations: a cross-sectional study on Actuel sur Rue. *Int J STD AIDS*. 2016;27(11):973–7.
12. Rudduck T, Brown S. Assessing the use of a peer-led mobile van for effective HIV service delivery in regional Queensland: A whole of community approach. *Sex Transm Infect*. 2015;91:A240.
13. Knight V, Wand H, Gray J, Keen P, McNulty A, Guy R. Convenient HIV testing service models combined with rapid testing are attracting previously untested gay and bisexual men. *Sex Transm Infect*. 2015;91:A224.
14. Read TRH, Hocking JS, Bradshaw CS, Morrow A, Grulich AE, Fairley CK, et al. Provision of rapid HIV tests within a health service and frequency of HIV testing among men who have sex with men: randomised controlled trial. *BMJ*. 2013;347:f5086.
- 44 Point of Care Testing for Sexually Transmitted and Blood-borne Infections
15. Ryan KE, Wilkinson AL, Leitinger D, El-Hayek C, Ryan C, Pedrana A, et al. Characteristics of gay, bisexual and other men who have sex with men testing and retesting at Australia's first shop-front rapid point-of-care HIV testing service. *Sex Health*. 2016;13(6):560–7.
16. Lee D, Fairley C, Cummings R, Bush M, Read T, Chen M. Men who have sex with men prefer rapid testing for syphilis and may test more frequently using it. *Sex Transm Dis*. 2010;37(9):557–8.
17. Fernandez-Lopez L, Reyes-Uruena J, Agusti C, Kustec T, Serdt M, Klavs I, et al. The COBATEST network: monitoring and evaluation of HIV community-based practices in Europe, 2014-2016. *HIV Med*. 2018;19:21–6.
18. Preau M, Lorente N, Sagaon-Teyssier L, Champenois K, Gall JML, Mabire X, et al. Factors associated with satisfaction with community-based non-medicalized counseling and testing using HIV rapid tests among MSM in France. *AIDS Care*. 2016;28(10):1240–8.
19. Champenois K, Le Gall JM, Jacquemin C, Jean S, Martin C, Rios L, et al. ANRS-COM'TEST: description of a community-based HIV testing intervention in non-medical settings for men who have sex with men. *BMJ Open*. 2012;2(2):e000693.
20. Surah S, O'Shea S, Dunn H, Mitra R, Fitzgerald C, Ibrahim F, et al. Utilization of HIV point-of-care testing clinics in general practice and genitourinary medicine services in south-east London. *Int J STD AIDS*. 2009;20(3):168–9.
21. Jeffrey N, Harrison A, Lawson J, Haney L, Mallace L, Foster K. A shot in the dark -- will outreach STI and HIV testing work in Newcastle saunas? *HIV Med*. 2014;15:40.
22. Evans L, Funk D. Integrating rapid hepatitis C testing into a communitybased HIV testing program targeting MSM. *Sex Transm Dis*. 2014;41:S106.
23. Hayward R, Boothby M. The role of syphilis point-of-care testing in the management of patients with genital ulceration. *Sex Transm Infect*. 2016;92:A79.
24. Fernandez Ballbuena S, Hoyos J, Belza MJ, Pujol F, Alvarez J, Zulaica D, et al. HIV Rapid Testing Programs in Non-Clinical Settings have the Potential to Constitute a Major Diagnostic Option for MSM in Spain. *AIDS Behav*. 2017;21(2):525–33

Bibliography (cont'd)

25. Belza MJ, Hoyos J, Balbuena SF, Diaz A, Bravo MJ, la de Fuente L, et al. Assessment of an out reach street-based HIV rapid testing programme as a strategy to promote early diagnosis: A comparison with two surveillance systems in Spain, 2008-2011. *Eurosurveillance*. 2015;20(14):1–11.
26. de la Fuente L, Delgado J, Hoyos J, Belza MJ, Alvarez J, Gutierrez J, et al. Increasing early diagnosis of HIV through rapid testing in a street outreach program in Spain. *AIDS Patient Care STDS*. 2009;23(8):625–9.
27. Qvist T, Cowan SA, Graugaard C, Helleberg M. High linkage to care in a community-based rapid HIV testing and counseling project among men who have sex with men in Copenhagen. *Sex Transm Dis*. 2014;41(3):209–14.
A Canadian Realist Review 45
28. O'Neal J D, Golden MR, Branson BM, Stekler JD. HIV nucleic acid amplification testing versus rapid testing: It is worth the wait. Testing preferences of men who have sex with men. *J Acquir Immune Defic Syndr*. 2012;60(4):e117–20.
29. Reynolds GL, Fisher DG, Napper LE, Marsh KA, Willey C, Brooks R. Results from a multiple morbidities testing program offering rapid HIV testing bundled with hepatitis and sexually transmitted infection testing. *Public Heal Reports*. 2008;123:63–9.
30. Daskalakis D, Silvera R, Bernstein K, Stein D, Hagerty R, Hutt R, et al. Implementation of HIV testing at 2 New York City bathhouses: from pilot to clinical service. *Clin Infect Dis*. 2009;48(11):1609–16.
31. Block R, Fitch J, Wendell D. Using rapid syphilis testing to increase screening in community based clinics and organizations. *Sex Transm Dis*. 2016;43(10):S135.
32. Al-Tayyib A, Ginnett L, Edel M, Weise J, Thrun M. PCSI in practice: Fully integrated screening for hepatitis C virus in an STD clinic. *Sex Transm Dis*. 2014;41:S127.
33. Leon S, Cordova LR, Konda KA, Flores JA, Romero L, Salvatierra HJ, et al. Missed opportunities for HIV diagnosis when using 3rd generation rapid point-of-care HIV antibody testing. *Sex Transm Dis*. 2014;41:S142–3.
34. Montano D, Mueses-Marin HF, Galindo J, Kim J, Martinez-Cajas JL, Wylie J, et al. Integrating respondent driven sampling (RDS) recruitment and peer facilitation: Preliminary results on reaching populations most at risk for HIV/syphilis in Cali, Colombia. *Can J Infect Dis Med Microbiol*. 2015;26:88B.
35. Su JY, Garton L, Russell M, Yip TW, Gunathilake M, Thalanany M, et al. Are rapid point-of-care tests for syphilis useful in outbreak settings in remote australia?-an experience from the northern territory. *Sex Transm Infect*. 2015;91:A28.
36. Benzaken A, Pinto VM, Carvalho CH, Peeling R. Increasing access to HIV and syphilis screening in remote areas using rapid tests. *Sex Transm Infect*. 2011;87:A2.
37. Ruffinen CZ, Sabido M, Diaz-Bermudez XP, Lacerda M, Mabey D, Peeling RW, et al. Point-of-care screening for syphilis and HIV in the borderlands: challenges in implementation in the Brazilian Amazon. *BMC Health Serv Res*. 2015;15:495.
38. Carvalho CH, Benzaken A, Peeling R, Santos A, Terris-Prestholt F. Cost-effectiveness of introducing rapid syphilis testing in the Amazon region, Brazil. *Sex Transm Infect*. 2011;87:A333.
39. Castel AD, Magnus M, Peterson J, Anand K, Wu C, Martin M, et al. Implementing a novel citywide rapid HIV testing campaign in Washington, D.C.: Findings and lessons learned. *Public Health Rep*. 2012;127(4):422–31.
40. Pascom ARP, Dutra de Barros CH, Lobo TD d M, Pasini EN, Comparini RA, Caldas de Mesquita F. Point-of-care HIV tests done by peers, Brazil. *Bull World Health Organ*. 2016;94(8):626–30.
41. Schulden JD, Song B, Barros A, Mares-DelGrasso A, Martin CW, Ramirez R, et al. Rapid HIV testing in transgender communities by community-based organizations in three cities. *Public Heal Reports (Washington, DC 1974)*. 2008;123 Suppl:101–14.
- 46 Point of Care Testing for Sexually Transmitted and Blood-borne Infections
42. Shrestha RK, Sansom SL, Schulden JD, Song B, Smith LC, Ramirez R, et al. Costs and effectiveness of finding new HIV diagnoses by using rapid testing in transgender communities. *AIDS Educ Prev*. 2011;23(3):49–57.
43. Alimohammadi A, Holeksa J, Truong D, Conway B. Using rapid point of care HCV testing to engage marginalized inner city populations. *J Viral Hepat*. 2018;25:154.
44. Conway B, Hakobyan S, Kerkerian G, Sharma S, Tahmasebi S, Tossonian H. Community-based infectious disease clinics: A tool of engagement for vulnerable populations. *Can J Infect Dis Med Microbiol*. 2015;26(2):e25.
45. Conway B, Vafadary S, Sharma S, Zahedieh F, Shrivah J, Raycraft T, et al. The community pop-up clinic as a tool of engagement for vulnerable populations with HCV and HIV infections. *Can J Gastroenterol Hepatol*. 2016;2016.
46. Hakobyan S. Cascade of care of HCV & HIV infected patients identified through community pop-up clinics (CPCs). *Hepatology*. 2015;62:1131A.

Bibliography (cont'd)

47. Kiani G, Shahi R, Alimohammadi A, Raycraft T, Singh A, Conway B. Community pop-up clinic: A harm reduction strategy to engage hepatitis C virus infected injection drug users. *J Hepatol.* 2017;66(1):S489.
48. Rashidi B, Tossonian H, Sharma S, Hung A, Yen K, Huang X, et al. Engaging high risk populations of downtown Vancouver through Hepatitis C and HIV portable pop-up clinics. *Can J Infect Dis Med Microbiol.* 2014;25:19A.
49. Thumath MA, Compton M, Bath M, Bolton S. A peer HIV testing and linkage to care pilot among IDUs in Vancouver during a Treatment as Prevention (TasP) pilot. *Can J Infect Dis Med Microbiol.* 2012;23:13A.
50. Lazarus L, Patel S, Shaw A, Leblanc S, Lalonde C, Hladik M, et al. Uptake of community-based peer administered HIV point-of-care testing: Findings from the PROUD study. *PLoS ONE [Electronic Resour.]* 2016;11(12):e0166942.
51. Williams B, Pedrana A, Howell J, Doyle J, Thompson A, Bramwell F, et al. Increasing hepatitis C testing uptake with point of care testing from the needle and syringe exchange desk lessons learned from the Rapid EC Feasibility Study. *J Viral Hepat.* 2018;25:28–9.
52. Doyle J, Hutton J, Zordan R, Cocco A, Iser S, Weiland T, et al. Hepatitis C in the ED-screening and linkage to care for hepatitis C infection in the emergency department using point-of-care testing. *Hepatol Int.* 2018;12(2):S238.
53. Evans A, Linzey D, Booth J. An innovative model for improving access to and uptake of testing and treatment for patients with chronic hepatitis C in the substance misuse community. *Gut.* 2012;61:A78.
54. Apoola A, Brunt L. A randomised controlled study of mouth swab testing versus same day blood tests for HIV infection in young people attending a community drug service. *Drug Alcohol Rev.* 2011;30(1):101–3.
A Canadian Realist Review 47
55. Fernandez-Lopez L, Folch C, Majo X, Gasulla L, Casabona J. Implementation of rapid HIV and HCV testing within harm reduction programmes for people who inject drugs: A pilot study. *AIDS Care.* 2016;28(6):712–6.
56. Schaffer D, Rensmann W, Leicht A, Wetzchewald A. TESTIT-rapid HCV/HIV testing for drug users in low-threshold services. *Suchtmedizin Forsch Und Prax.* 2013;15(4):241.
57. Scognamiglio P, Chiaradia G, Giovanetti M, Albertini E, Camposeragna A, Farinella M, et al. HIV rapid testing in community and outreach sites: results of a nationwide demonstration project in Italy. *BMC Public Health.* 2018;18(1):748.
58. Melin P, Hapca A, Hij A, Morel M, Volant J, Merlet E, et al. Ora-quick rapid test for HCV-A new and very interesting strategy. A 194 drug users study in a French center: Csapa 52. *J Gastrointest Liver Dis.* 2012;21:61.
59. Reynolds GL, Fisher DG, Brocato J, van Otterloo L, Khahlil K, Huckabay L. Stressful point-of-care rapid testing for human immunodeficiency virus, hepatitis C virus, and syphilis. *Int J STD AIDS.* 2017;28(10):975–84.
60. Barocas JA, Linas BP, Kim AY, Fangman J, Westergaard RP. Acceptability of rapid point-of-care hepatitis C tests among people who inject drugs and utilize syringe-exchange programs. *Open Forum Infect Dis.* 2016;3(2).
61. Haynes LF, Korte JE, Holmes BE, Gooden L, Matheson T, Feaster DJ, et al. HIV rapid testing in substance abuse treatment: implementation following a clinical trial. *Eval Program Plann.* 2011;34(4):399–406.
62. Seewald R, Bruce RD, Elam R, Tio R, Lorenz S, Friedmann P, et al. Effectiveness and feasibility study of routine HIV rapid testing in an urban methadone maintenance treatment program. *Am J Drug Alcohol Abuse.* 2013;39(4):247–51.
63. Trooskin SB, Tzarnas S, Allen M, Brodsky A, Magaldi L, Moy C. Impact of HCV testing in a targeted group of high risk individuals from the community. *Gastroenterology.* 2015;148(4):S1096.
64. Aoussoumou SA, Paniagua SM, Linas B, Wang J, Samet JH, Hall J, et al. Rapid vs. standard testing for HIV and HCV at a drug detox: A randomized trial. *Top Antivir Med.* 2018;26:451s-452s.
65. Ramers CB, Lewis R, Reyes L, Kuo A, Wyles DL. Initial results of a community-based rapid Hepatitis C testing and linkage to care program. *Top Antivir Med.* 2014;22:333–4.
66. Ramers CB, Lewis R, Reyes L, Wallace D, Gish R, Wyles D, et al. One-year results of a community-based hepatitis C testing and linkage-to-care program. *Top Antivir Med.* 2015;23:289.
67. Ford M, Jordan A, Rude EJ, Johnson N, Hagan H, Laraque F, et al. Check hep C: A community-based approach to hepatitis C diagnosis in high-risk populations. *Hepatology.* 2014;60:894A.
68. Stockman LJ, Guilfoye SM, Benoit AL, Vergeront JM, Davis JP, Centers for Disease C. Rapid hepatitis C testing among persons at increased risk for infection--Wisconsin, 2012-2013. *MMWR Morb Mortal Wkly Rep.* 2014;63(14):309–11.

Bibliography (cont'd)

69. Wong VWS, Wong GLH, Chim AML, Cheng TF, Cheung SWY, Lai CMS, et al. Targeted hepatitis C screening among ex-injection drug users in the community. *J Gastroenterol Hepatol.* 2014;29(1):116–20.
70. Winnichuk HJ, Demarinis C. Immunization uptake in a hard to reach high risk population - An unexpected benefit of point of care (POC) HIV testing. *Can J Infect Dis Med Microbiol.* 2010;21(4):190–1.
71. Anaya HD, Butler JN, Knapp H, Chan K, Conners EE, Rumanes SF. Implementing an HIV rapid testing-linkage-to-care project among homeless individuals in Los Angeles County: A collaborative effort between Federal, County, and City Government. *Am J Public Health.* 2015;105(1):85–90.
72. Lambert J, Cullen W, Oprea C, Story A, Sanchez JM, Surey J. Hepcare Europe: HepCheck; reaching vulnerable populations. *J Hepatol.* 2018;68:S153.
73. Lambert JS, Murphy C, O'Carroll A, Farrell J, Patel A, Avramovic G, et al. The Dublin hepcheck study: Community based testing of HCV by point of care oraquick HCV saliva test in homeless populations. *J Hepatol.* 2016;64(2):S726.
74. Preston S, Heaney S, Andrews J. A hepatitis C screening program for the homeless in New Orleans. *J Gen Intern Med.* 2016;31(2):S96.
75. Selvapatt N, Harrison L, Brown A. A pilot study of outreach testing for hepatitis C and linkage to care in a London centre for homeless persons. *Gut.* 2015;64:A109.
76. Stockwell S, Dean G, Cox T, Tweed M, Poole J, Hume G, et al. The sexual health of the homeless-an outreach sexual health screening project. *Sex Transm Infect.* 2015;91:A90.
77. Surey J, Story A, Menezes D, Conneely J, Hayward A. Earth study (phase 1): Expanding access to rapid treatment for hepatitis C. *J Hepatol.* 2016;64(2):S461–2.
78. Yaworski H, Hutlet P, Grierson R, Weldon E, Sneath R, Kasper K, et al. HIV point of care testing by community paramedics in a vulnerable population: A pilot study. *Can J Emerg Med.* 2016;18:S126.
79. Gahagan J, Hatchette T, Proctor-Simms M, Sharma S, Atkinson J, MacIsaac C. HIV point-of-care-testing: Results of a Nova Scotia-based pilot project. *Can J Infect Dis Med Microbiol.* 2015;26:131B.
80. Bergman J, Gratrix J, Plitt S, Fenton J, Archibald C, Wong T, et al. Feasibility and field performance of simultaneous syphilis and HIV point-of-care test based screening strategy in at risk populations in Edmonton, Canada. *AIDS Res Treat.* 2013;2013:819593.
81. Beckwith CG, Bazerman L, Cornwall AH, Patry E, Poshkus M, Fu J, et al. An evaluation of a routine opt-out rapid HIV testing program in a Rhode Island jail. *AIDS Educ Prev.* 2011;23(3):96–109.
82. Bannan CL, Lynch PA, Conroy EP, O'Dea S, Surah S, Betts-Symonds G, et al. Point-of-care testing for HIV in an Irish prison setting: Results from three major Irish prisons. *Int J STD AIDS.* 2016;27(11):950–4.
- A Canadian Realist Review 49
83. Candfield S, Samuel MI, Ritchie D, McDonald C, Brady M, Taylor C. Use and acceptability of salivary hepatitis C virus testing in an English Young Offender Institution. *Int J STD AIDS.* 2017;28(12):1234–8.
84. Beckwith CG, Kurth AE, Bazerman LB, Patry EJ, Cates A, Tran L, et al. A pilot study of rapid hepatitis C virus testing in the Rhode Island Department of Corrections. *J Public Health (Bangkok).* 2016;38(1):130–7.
85. Spaulding AC, Kim MJ, Corpening KT, Carpenter T, Watlington P, Bowden CJ. Establishing an HIV Screening Program Led by Staff Nurses in a County Jail. *J Public Heal Manag Pract.* 2015;21(6):538–45.
86. Tartaro C, Levy MP. An evaluation of an HIV testing program in the jail setting: Results and recommendations. *Prison J.* 2013;93(1):57–79.
87. Macgowan R, Margolis A, Richardson-Moore A, Wang T, Lalota M, French PT, et al. Voluntary rapid human immunodeficiency virus (HIV) testing in jails. *Sex Transm Dis.* 2009;36(2):S9-13.
88. Shrestha RK, Sansom SL, Richardson-Moore A, French PT, Scalco B, Lalota M, et al. Costs of voluntary rapid HIV testing and counseling in jails in 4 states--advancing HIV Prevention Demonstration Project, 2003-2006. *Sex Transm Dis.* 2009;36(2):S5-8.
89. Simonsen KA, Shaikh RA, Earley M, Foxall M, Boyle C, Islam KM, et al. Rapid HIV screening in an urban jail: How testing at exit with linkage to community care can address perceived barriers. *J Prim Prev.* 2015;36(6):427–32.
90. Zaller ND, Patry EJ, Bazerman LB, Noska A, Kuo I, Kurth A, et al. A pilot study of rapid Hepatitis C testing in probation and parole populations in Rhode Island. *J Health Care Poor Underserved.* 2016;27(2):214–23.
91. Gordon MS, Kinlock TW, McKenzie M, Wilson ME, Rich JD. Rapid HIV testing for individuals on probation/parole: outcomes of an intervention trial. *AIDS Behav.* 2013;17(6):2022–30.

Bibliography (cont'd)

92. Lessard D, Lebouche B, Engler K, Thomas R, Machouf N. Explaining the appeal for immigrant men who have sex with men of a community-based rapid HIV-testing site in Montreal (Actuel sur Rue). *AIDS Care - Psychol Socio-Medical Asp AIDS/HIV*. 2015;27(9):1098–103.
93. Ho E, Michielsen P, Damme P V, Ieven M, Veldhuijzen I, Vanwolleghem T. Point of care tests for hepatitis B and C infection are associated with a higher linkage to care in an Asian migrant population. *J Viral Hepat*. 2018;25:163.
94. Wouters K, Franssen K, Beelaert G, Kenyon C, Van Ghysseghem C, Collier I, et al. Use of rapid HIV test in low threshold centre in Antwerp, Belgium during 2007-2012. *Sex Transm Infect*. 2013;89.
95. Esteban-Vasallo MD, Moran-Arribas M, Garcia-Riolobos C, Dominguez-Berjon MF, Rico-Bermejo J, Collado-Gonzalez S, et al. Targeted rapid HIV testing in public primary care services in Madrid. Are we reaching the vulnerable populations? *Int J Infect Dis*. 2014;19:39–45.
96. Ilaria U, Marina C, De Carolis S, Petrelli A, Vescio MF, Pezzotti P. Comparison of rapid and venous HIV testing strategies among vulnerable populations. *Eur J Epidemiol*. 2015;30(8):814–5.
- 50 Point of Care Testing for Sexually Transmitted and Blood-borne Infections
97. Uccella I, Cammilli M, Viale S, Fazioli C, Testa R, Mirisola C. HIV rapid testing in the framework of a STI prevention project for vulnerable populations. *Sex Transm Infect*. 2013;89.
98. Saunders S, Tulloch K, Maan EJ, van Schalkwyk J, Money DM. An Evaluation of Introduction of Rapid HIV Testing in a Perinatal Program. *J Obstet Gynaecol Canada JOGC*. 2017;39(8):668–75.
99. Johnston JB, Reimer JN, Wylie JL, Bullard J. Observational study of the populations accessing rapid point-of-care HIV testing in Winnipeg, Manitoba, Canada, through a retrospective chart review of site records. *Sex Transm Infect*. 2018;94(3):194–9.
100. Criniti SM, Aaron E, Levine AB. Using the rapid HIV test to rescreen women in the third trimester of pregnancy. *J Midwifery Womens Heal*. 2009;54(6):492–6.
101. Kudryashova-Hernandez L. One body, one test, two lives: Patient centered strategy to increase HIV testing in pregnant women and their partners. *Retrovirology*. 2012;9.
102. Gaitán-Duarte HG, Newman L, Laverty M, Habib NA, González-Gordon LM, Ángel-Müller E, et al. Comparative effectiveness of single and dual rapid diagnostic tests for syphilis and HIV in antenatal care services in Colombia. *Revisita Panam Salud Publica/ Pan Am J Public Heal*. 2016;40(6):455–61.
103. Garcia PJ, Peeling R, Mabey D, Holmes KK. Implementation of rapid tests for prenatal syphilis screening: Overcoming health system constraints. *Sex Transm Infect*. 2011;87:A5.
104. Garcia P, Peeling R, Mabey D, Holmes K. The CISNE project: Implementation of POCT for syphilis and HIV in antenatal care and reproductive health services in Peru. *Sex Transm Infect*. 2013;89.
105. Bungay V, Kolar K, Thindal S, Remple VP, Johnston CL, Ogilvie G. Community-based HIV and STI prevention in women working in indoor sex markets. *Health Promot Pract*. 2013;14(2):247–55.
106. Fernandez-Balbuena S, Belza MJ, Urdaneta E, Estes R, Rosales-Statkus ME, de la Fuente L, et al. Serving the underserved: an HIV testing program for populations reluctant to attend conventional settings. *Int J Public Health*. 2015;60(1):121–6.
107. Fernandez-Balbuena S, de la Fuente L, Hoyos J, Rosales-Statkus ME, Barrio G, Belza MJ, et al. Highly visible street-based HIV rapid testing: Is it an attractive option for a previously untested population? A cross-sectional study. *Sex Transm Infect*. 2014;90(2):112–8.
108. Diserens EA, Bodenmann P, N’Garambe C, Ansermet-Pagot A, Vannotti M, Masserey E, et al. Clients of sex workers in Switzerland: it makes sense to counsel and propose rapid test for HIV on the street, a preliminary report. *BMC Infect Dis*. 2010;10:74.
109. Sabido M, Benzaken AS, De-Andrade-Rodrigues EJ, Mayaud P. Rapid point-of-care diagnostic test for syphilis in high-risk populations, Manaus, Brazil. *Emerg Infect Dis*. 2009;15(4):647–9.
110. Chen XS, Yin YP, Wei WH, Peeling R. Screening high-risk populations using rapid syphilis tests: The importance of social and cultural contexts. *Sex Transm Infect*. 2011;87:A2–3.
111. Asher AK, Evans J, Hahn JA, Briceno A, Page K. Behavioral risk changes in young people who inject drugs following rapid HCV testing. *Hepatology*. 2014;60:1061A. *A Canadian Realist Review* 51
112. Author. Reach at-risk youth with rapid HIV tests [Internet]. Vol. 30, *Relias Media*. 2009. p. 46–8. Available from: <https://www.reliasmedia.com/articles/112422-reach-at-risk-youth-with-rapid-hiv-tests?v=preview>
113. Gwadz M V, Cleland CM, Quiles R, Nish D, Welch J, Michaels LS, et al. CDC HIV testing guidelines and the rapid and conventional testing practices of homeless youth. *AIDS Educ Prev*. 2010;22(4):312–27.
114. Umaipalan A, Creighton S, Millett D. Outreach HIV testing. *HIV Med*. 2011;12:58.

Bibliography (cont'd)

115. Millett D, Creighton S. HIV testing as part of NHS health checks: Report from a community testing initiative. *HIV Med.* 2010;11:115.
116. Harrison C, Warriner J, Skinner C, Larbalestier N, Ward P. Community HIV testing: the feasibility and acceptability of assertive outreach and community testing to reduce the late diagnosis of HIV M Brady. *HIV Med.* 2011;12:4.
117. Sekhon P, Corredor C, Resinenete J, Quraishi A, Dhairyawan R, Soni S. Outreach initiatives encourage HIV testing in hard-to-reach communities. *HIV Med.* 2014;15:106–7.
118. Dunkley Y, Swift B, Chiu F, Warwick J, Worrall S. Making the case for community HIV testing: A comparison of targeted community testing demographics, reactivity and testing frequency across level 2 and 3 services, online self-sampling and community provision within East London. *HIV Med.* 2018;19:S137.
119. Freeman-Romilly M, Sheppard P, Desai S, Cooper N, Brady M. Does community-based point-of-care HIV testing reduce late HIV diagnosis? A retrospective cohort study. *HIV Med.* 2014;15:93.
120. Roberts C, Watson L, Turner R, Caverley-Frost L, Scott P, Allen K. Reaching the unreachable-nurse-led STI screening at erotica 2013. *HIV Med.* 2014;15:27.
121. Hoyos J, Belza MJ, Fernandez-Balbuena S, Rosales-Statkus ME, Pulido J, de la Fuente L, et al. Preferred HIV testing services and programme characteristics among clients of a rapid HIV testing programme. *BMC Public Health.* 2013;13:791.
122. Camacho-Gonzalez AF, Gillespie SE, Thomas-Seaton L, Frieson K, Hussen SA, Murray A, et al. The Metropolitan Atlanta community adolescent rapid testing initiative study: Closing the gaps in HIV care among youth in Atlanta, Georgia, USA. *AIDS.* 2017;31:S267–75.
123. Feldacker C, Torrone E, Triplette M, Smith JC, Leone PA. Reaching and retaining high-risk HIV/AIDS clients through the internet. *Health Promot Pract.* 2011;12(4):522–8.
124. Magaldi L, Brown N, Coleman C, Dorshimer M, Kostman J, Zaret D, et al. Testing and linkage to care outcomes in baby boomers versus young adults tested in the community and linked to care at a Federally Qualified Health Center in the US. *J Hepatol.* 2018;68:S159–60.
125. Zinski A, Dougherty SM, Tamhane A, Ross-Davis KL, Raper JL. Point-of-care HIV testing and linkage in an urban cohort in the southern US. *AIDS Res Treat.* 2013;2013:789413.
126. Bowles KE, Clark HA, Tai E, Sullivan PS, Song B, Tsang J, et al. Implementing rapid HIV testing in outreach and community settings: Results from an advancing HIV prevention demonstration project conducted in seven U.S. cities. *Public Health Rep.* 2008;123:78–85.
- 52 Point of Care Testing for Sexually Transmitted and Blood-borne Infections
127. Eggman AA, Feaster DJ, Leff JA, Golden MR, Castellon PC, Gooden L, et al. The cost of implementing rapid HIV testing in sexually transmitted disease clinics in the United States. *Sex Transm Dis.* 2014;41(9):545–50.
128. Keller S, Jones J, Erbeling E. Choice of Rapid HIV testing and entrance into care in Baltimore City sexually transmitted infections clinics. *AIDS Patient Care STDS.* 2011;25(4):237–43.
129. Becker M, Thompson L, Bridger N, Pindera C, Keynan Y, Bullard J, et al. Point of care HIV testing in a tertiary care emergency department in Winnipeg, Canada. *Can J Infect Dis.* 2012;23:14A.
130. Becker ML, Thompson LH, Pindera C, Bridger N, Lopez C, Keynan Y, et al. Feasibility and success of HIV point-of-care testing in an emergency department in an urban Canadian setting. *Can J Infect Dis Med Microbiol.* 2013;24(1):27–31.
131. Lee B, Fenton J, Preiksaitis J, Singh A. Evaluation of a rapid HIV testing pilot program in acute care settings in Alberta, Canada. *Int J Antimicrob Agents.* 2009;34:S71.
132. Genet P, Legall C, Peudepiece P, Briand F, Courdavault L. Difficulties of routine rapid HIV screening in emergency department. *Retrovirology.* 2010;7:P108.
133. Leblanc LJ, Jegou C, Fossoux N, Lancien C, Bastide T, Verbrugge R, et al. Effectiveness of nurse-driven HIV screening targeting key populations in emergency departments in metropolitan Paris: The anrs dici-vih cluster-randomized two-period crossover trial. *Clin Ther.* 2017;39(8):e5.
134. Geretti AM, Austin H, Villa G, Williams J, Davies P, Hopkins M, et al. Point-of-care HCV RNA screening by finger-prick is technically feasible but uptake is reduced by concomitant offer of HIV testing. *HIV Med.* 2018;19:S56–7.
135. Cirone M V, Probst BD, Stake CE, Bacidore VA, McShane C, Cichon ME, et al. The implementation of opt-in rapid HIV testing in an urban emergency department. *Ann Emerg Med.* 2013;62(4):S64.
136. Lowman E, Harper JB, Livak M, Jain S, Rush A, Kessler A, et al. Rapid HIV testing in a large urban emergency department. *Ann Emerg Med.* 2009;54(3):S39–40.

Bibliography (cont'd)

137. Manteuffel J, Markowitz N, Ham DC, Slezak M, Perrotta G, Peters PJ, et al. Implementation of an emergency department syphilis and HIV point-of-care screening process during an outbreak of syphilis in Detroit, MI in collaboration with the infectious disease department and the centers for disease control and prevention. *Ann Emerg Med.* 2016;68(4):S148.
138. Schlesinger S, Arora S, Menchine M, Newton K, Jacobson K, Takayama C, et al. Routine, non-targeted screening for HIV: Year one findings of the “R/O HIV in the LAC+USC ED” program. *Ann Emerg Med.* 2012;60(4):S24–5.
139. Hsieh YH, Jung JJ, Shahan JB, Pollack HA, Hairston HS, Moring-Parris D, et al. Outcomes and cost analysis of 3 operational models for rapid HIV testing services in an academic inner-city emergency department. *Ann Emerg Med.* 2011;58(1):S133-139.
140. Christopoulos KA, Kaplan B, Dowdy D, Haller B, Nassos P, Roemer M, et al. Testing and linkage to care outcomes for a clinician-initiated rapid HIV testing program in an urban emergency department. *AIDS Patient Care STDS.* 2011;25(7):439–44.
A Canadian Realist Review 53
141. Osorio G, Giurgiulescu A, Hennessey Z, Wood A, Egan D, Wiener D, et al. Counselor Based Versus Integrated Routine HIV Screening in an Urban Emergency Department. *Top Antivir Med.* 2014;22:511.
142. Richey LE, Carpenter EJ, Barbeau JM, Hadi CM. Rapid HIV Testing in a New Orleans Emergency Department is Effective in Identifying New HIV Diagnoses and in Linking Patients to Care. *J Louisiana State Med Soc.* 2014;166(1):28–33.
143. Lubelchek RJ, Kroc KA, Levine DL, Beavis KG, Roberts RR. Routine, rapid HIV testing of medicine service admissions in the emergency department. *Ann Emerg Med.* 2011;58(1):S65-70.
144. Calderon Y, Leider J, Hailpern S, Chin R, Ghosh R, Fetting J, et al. High-volume rapid HIV testing in an urban emergency department. *AIDS Patient Care STDS.* 2009;23(9):749–55.
145. White DAE, Anderson ES, Pfeil SK, Trivedi TK. Results of a rapid hepatitis c screening and diagnostic testing program in an urban emergency department. *Acad Emerg Med.* 2015;22(5):S235–6.
146. Minak J, Syverud S, Dillingham R, Dort K, Gessner A. Patient perceptions of HIV testing in a non-urban emergency department’s express care. *Ann Emerg Med.* 2012;60(4):S83.
147. Ashby J, Braithwaite B, Gnani S, Walsh J, Cooke G. HIV testing in a polyclinic setting can reach untested “at-risk” groups. *HIV Med.* 2010;11:115–6.
148. Lascar M, Freer J, Phiri E. Tailoring HIV testing in a setting of late HIV diagnosis-is the tide turning? Re-audit of late HIV diagnosis after expanding HIV testing. *HIV Med.* 2014;15:82.
149. McMullen H, Leber W, Griffiths C, Mguni S, Anderson J, Millett D, et al. What is the experience of patients testing HIV-positive through rapid testing in general practice? A qualitative study. *HIV Med.* 2016;17:33.
150. Feldman J, Romine RS, Bockting WO. HIV risk behaviors in the U.S. transgender population: prevalence and predictors in a large internet sample. *J Homosex.* 2014;61(11):1558–88.
151. Anaya HD, Butler JN, Solomon JL, Knapp H, Hoang T, Kan V, et al. Implementation of nurse-initiated rapid HIV testing at high-prevalence primary care sites within the US Veterans Affairs health care system. *Sex Transm Dis.* 2013;40(4):341–5.
152. Flores EC, Lluque ME, Chiappe M, Lino R, Bayer AM. Operations research study to implement HIV and syphilis point-of-care tests and assess client perceptions in a marginalised area of Lima, Peru. *Int J STD AIDS.* 2015;26(10):723–8.
153. Pringle JJ, Hoyano D, Bannar-Martin S, Rai B, Chow N, Buchner C, et al. Using pharmacy-based HIV point of care testing to access hard to reach populations. *Can J Infect Dis Med Microbiol.* 2015;26:88B.
154. Buchanan R, Parkes J, Noble K, Grellier L, Youde R, Khakoo SI. The uptake of pharmacy-based targeted screening for hepatitis c in an isolated network of people who inject drugs. *Gut.* 2017;66:A98.
155. Phillips M, Vollans B, McFarlane L, Beckett-Hill C. In the community: A pilot service evaluation of HIV point of care testing community pharmacies. *HIV Med.* 2018;19:S52.
54 Point of Care Testing for Sexually Transmitted and Blood-borne Infections
156. Fernandez-Balbuena S, Marcos H, Perez-Rubio A, Hoyos J, Belza MJ, de la Fuente L. The rapid test in Spanish pharmacies: A novel programme to reach heterosexual men? *HIV Med.* 2015;16(6):362–9.
157. Dong BJ, Lopez M, Cocohoba J. Pharmacists performing hepatitis C antibody point-of-care screening in a community pharmacy: A pilot project. *J Am Pharm.* 2017;57(4):510-515.e512.
158. Klepser M, Klepser DG, Dering-Anderson A, Morse J, Gulick P, Coyle J, et al. Implementation and evaluation of a collaborative community pharmacy-based hepatitis C virus (HCV) screening program with linkage to care. *Pharmacotherapy.* 2017;37(12):e223.
159. Calderon Y, Cowan E, Rhee JY, Brusalis C, Leider J. Counselor-based rapid HIV testing in community pharmacies. *AIDS Patient Care STDS.* 2013;27(8):467–73.

Bibliography (cont'd)

160. Weidle PJ, Lecher S, Botts LW, Jones L, Spach DH, Alvarez J, et al. HIV testing in community pharmacies and retail clinics: a model to expand access to screening for HIV infection. *J Am Pharm Assoc.* 2014;54(5):486–92.
161. Bradley ELP, Vidot DC, Gaul Z, Sutton MY, Pereyra M. Acceptability of oral rapid HIV testing at dental clinics in communities with high HIV prevalence in South Florida. *PLoS One.* 2018;13(4):e0196323.
162. Jackson-Malik P, McLaughlin MJ, O'Hara KT, Buxbaum LU. Rapid oral fluid testing for HIV in veterans with mental health diagnoses and residing in community-assisted living facilities. *J Assoc Nurses AIDS Care.* 2011;22(2):81–9.
163. Bischof JJ, Bell LL, Pierce JK, Cooper KL, Heine AD, Quinlivan EB, et al. Detecting HIV among persons accompanying patients to an infectious diseases clinic. *Sex Transm Dis.* 2015;42(1):54–6.
164. Negoita S, Campbell E, Hsieh YH, Rothman R. Outcomes of an integrated hepatitis C virus blood-based and point-of-care screening program. *Acad Emerg Med.* 2018;25:S143.
165. Morano JP, Zelenev A, Lombard A, Marcus R, Gibson BA, Altice FL. Strategies for hepatitis C testing and linkage to care for vulnerable populations: point-of-care and standard HCV testing in a mobile medical clinic. *J Community Health.* 2014;39(5):922–34.
166. Lucht A, Munstermann D, Hagedorn HJ, Tiemann C, Kuttner-May S. Rapid HIV testing in the public health setting in north Rhine-Westphalia, 2011-2012. *Sex Transm Infect.* 2013;89.
167. Bernal H, Pereira AA, Pires A, Costa AR, Ayer EZ, Bolzan A, et al. Improved timely diagnosis of HIV related to the policy of expanding access to diagnosis in Brazil. *Sex Transm Infect.* 2013;89.
168. Dijkstra M, Bruisten S, Hoornenborg E, Hogewoning A, De Vries H, Schim Van Der Loeff M, et al. Implementation of a rapid HIV-1 RNA test in diagnosing acute HIV infections among visitors of the Amsterdam clinic of sexually transmitted infections. *J Clin Virol.* 2016;82:S7–8.
169. Delaney KP, Rurangirwa J, Facente S, Dowling T, Janson M, Knoble T, et al. Using a multitest algorithm to improve the positive predictive value of rapid HIV testing and linkage to HIV care in nonclinical HIV test sites. *J Acquir Immune Defic Syndr.* 2016;71(1):78–86.