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Express testing for sexually transmitted infections: clinical results

Patrick O'Byrne and Lauren Orser
University of Ottawa, Canada

Abstract

Background: Many sexually transmitted infection (STI) clinics are becoming unable to meet increases in service demand.

Aims: To address increased service delivery demand at our STI clinic, we implemented express testing, which involved self-assessment and visitation with a nurse who performed specimen collection but no examination.

Methods: Patient consent was obtained and chart review occurred.

Results: Of our patients who sought testing, 20% ($n = 1427/12{,}711$) were eligible for express testing, with 90.7% ($n = 1295/1427$) of these patients agreeing to use it. We identified 62 infections (all gonorrhoea and chlamydia) among the 1295 patients who used express. In streamlining care provision, express testing enabled us to see 334 more patients, among whom we identified an additional 27 infections (four patients with infectious syphilis, 23 with gonorrhoea or chlamydia).

Conclusion: Our results support the expanded use of express testing.

Keywords
express, nursing, STIs, testing

Introduction

Sexually transmitted infections (STIs), including HIV, can cause negative sequelae, ranging from chronic pain to infertility to death (CDC, 2015; Public Health Agency of Canada, 2018). Because many STIs can be asymptomatic, the only way to identify if such infections are present is through diagnostic testing (CDC, 2015; Public Health Agency of Canada, 2018). However, because some people do not have access to primary care and others cannot or will not obtain such testing from such providers, STI clinics are where some patients access care (Koester et al., 2013; Saunders et al., 2012). At the Sexual Health Clinic (SHC) in Ottawa, Canada, for example, reduced access in primary care has increased service demands,

Corresponding author:
Patrick O'Byrne, University of Ottawa, 451 Smyth Road Ottawa, ON K1H 8M5, Canada.
Email: pjobyrne@uottawa.ca

without corresponding increased service capacity, resulting in persons being denied services due to capacity issues. In 2010, there were nearly 19,000 patient visits, which increased to over 22,000 by 2013; in 2010, 50 persons were declined testing for capacity issues, while, in 2013, this number climbed to 1200 persons (O'Byrne et al., 2016).

One approach to increase service provision and decrease the number of patients turned away for capacity reasons is 'express testing', in which patients obtain STI testing (per clinical indication and patient request) without examination (O'Byrne et al., 2016). As part of this testing, patients complete a self-administered intake form and receive written materials about STIs/HIV and the testing process for these infections. Such models of care have been trialled in the USA, UK and Australia (Dombrowski and Golden, 2013; Fernando and Thompson, 2013; Knight et al., 2013; Rukh et al., 2013; Xu et al., 2013). Based on a review of Medline, CINAHL and Embase (up to 2017, no language restrictions), express testing has never been formally evaluated in Canada. In 2014, we implemented a nurse-led express testing model in the SHC (O'Byrne et al., 2016), and report on the first 12 months of usage.

Intervention

At the time of implementing express testing, our clinic model operated with the following: a triage nurse to screen all patients; assessment nurses to take patient histories, collect blood and urine samples and/or provide counselling about risk reduction or contraception as clinically indicated; and nurse practitioners and physicians for examinations, diagnoses and prescriptions as needed.

Express testing modified the sequences for STI/HIV testing to allow triage nurses to offer asymptomatic patients the opportunity to self-complete a written STI history and see an assessment nurse, who, under medical directives, reviewed this form and performed specimen collection, per clinical indication and patient consent. The nurse would then discharge the patient with instructions about turn-around time for test results and to return to clinic as needed.

The self-collected history form enquired about allergies, medication use, prior vaccination (for hepatitis A, B and the human papillomavirus), date of last sexual contact, types of sexual contact engaged in (oral, anal, vaginal sex), injection drug use (including steroids), date of last STI/HIV testing, previous STI/HIV diagnoses and, for females, gynaecologic history (last normal menses, contraception use and date of last cervical cancer screening). To be eligible for express testing, patients could not have symptoms, pregnancy concerns, or any need for contraception, emergency contraception, or HIV post-exposure prophylaxis (PEP). Our testing included nucleic acid amplification testing (NAAT) for urine chlamydia and gonorrhoea, culture for pharyngeal and rectal chlamydia and gonorrhoea, chemiluminescent immunoassay serologic screening for syphilis, and fourth generation antigen–antibody combination serologic screening for HIV.

We hypothesised that express testing would increase access for asymptomatic patients who otherwise might have been denied services due to capacity. We used the term 'let-ins' for patients who completed testing because express added space in our clinic schedules. Patients with symptoms, an STI diagnosis, a sexual partner diagnosed with an STI, or anyone who sought emergency contraception or PEP were not refused services, even after capacity was reached.

Methods

After a review of the literature and a pilot implementation of express testing (to establish feasibility and refine our processes), we prospectively collected data to evaluate this model.

Each patient who participated in express testing provided written consent to have their chart reviewed for research. Those who agreed were included in a manual chart review, and the following data were extracted about each patient who used express: age, sex, sex of sexual partners, injection drug use, self-reported HIV status, testing done at visit (gonorrhoea/chlamydia and site of testing, syphilis, HIV, hepatitis B, C), test results, if the patient returned for treatment and the time between testing and returning to clinic for treatment. We compiled the data in an Excel spreadsheet. The Government of Ontario Ministry of Health and Long-Term Care funded this project, and the Research Ethics Board at Ottawa Public Health approved it.

Results

From 22 May 2014 to 21 May 2015 ($n = 246$ clinic days), a total of 12,711 patients sought our services, of whom 56% ($n = 7118$) did so for testing; the remaining 44% ($n = 5593$) of patients sought care for STI treatment or contraception. In total, 20% ($n = 1427/7118$) of patients who sought STI/HIV testing were eligible for express, and 90.7% ($n = 1295/1427$) consented to use it. Of the 132 patients who the triage nurse deemed eligible for express testing, but who did not use it, 78.8% ($n = 104/132$) requested an examination as part of their testing (none ended up with a clinical diagnosis based on examination), and 6.7% ($n = 9/134$) reported symptoms on the self-assessment history form (after denying such symptoms at triage) and were ineligible for express testing as they required examination by a physician or nurse practitioner. Express testing was thus used by 10.2% ($n = 1295/12{,}711$) of all patients who presented for care, and 18.2% ($n = 1295/7118$) of patients who requested testing. Per shift, a range of 0 to 15 patients used express testing, with an average of 17.7% of ($n = 5$) patients using express testing.

The mean age of patients who used express testing was 30 years; 68.5% ($n = 887/1295$) were male, 31.5% ($n = 408/1295$) were female, and none identified as transgendered. Same sex partners were reported by 14.5% ($n = 129/887$) of male patients and 1.2% ($n = 5/408$) of female patients; 3.8% ($n = 49/1295$) of patients used injection drugs and one patient reported being HIV positive. Notably, 57.7% ($n = 747/1295$) of express patients had never sought our services before, and 3% ($n = 39/1295$) used express testing more than once during the data collection period.

Compared with STI testing, express testing took approximately 15 minutes less per patient (from *c*. 30 to *c*. 15 minutes per patient visit). Consequently, the average number of patients seen per clinician per four-hour shift increased from 6.0 pre-express implementation to 7.0 post-express implementation. Thus, capacity increased by zero to five patients per four-hour shift. The outcome of this increased per-shift capacity was that, during the 12 months of data analysis, an additional 334 patients were 'let-in' for testing, constituting an increased service capacity of 2.6% ($n = 334/12{,}711$) overall, and 4.7% ($n = 334/7118$) among patients seeking testing. This 'let-in' number, however, depended on the uptake of express and if capacity was reached.

While express testing increased patients' access to services, it did not surmount all issues. During the study period, we still denied services to 713 persons due to lack of capacity, ranging from 0 to 24 patients per shift, for an average of 2.9 refusals per clinic ($2.9 = 713$ persons/246 clinics). To compare pre-/post-express testing, in the 88 days before implementing express testing, we denied services to 687 persons, ranging from 0 to 25 per clinic shift, for an average of 7.8 refusals per clinic ($7.8 = 687$ persons/88 clinics). In

Table 1. Positive test results (MSM: men who have sex with men).

	Male (MSM)	Female	Total
Chlamydia			
Urethral	40 (8)	17	57
Pharyngeal	2 (2)	0	2
Rectal	1 (1)	0	1
Gonorrhoea			
Urethral	0	1	1
Pharyngeal	0	0	0
Rectal	1 (1)	0	1
Total	45 (12)	18	62

comparison, we denied services to 400 people in the first 88 days after implementing express testing, ranging from 0 to 24 persons per shift, for an average of 4.5 refusals per clinic ($4.5 = 400$ persons/88 clinics).

Of the patients who used express testing, chlamydia and gonorrhoea testing was done by 95.8% ($n = 1241/1295$) as urine testing, 92 as pharyngeal testing and 60 as rectal testing, while 945 patients did syphilis testing and 937 did HIV testing. A total of 62 infections were identified: 57 urethral chlamydia infections (40 males, eight with male partners, and 17 females, all with male partners), one urethral gonorrhoea infection (female with male partners), two pharyngeal chlamydia infections (both males with male partners), one rectal gonorrhoea infection (male with male partners), one rectal chlamydia infection (male with male partners). No syphilis, HIV, or pharyngeal gonorrhoea infections were identified. The positivity rates for express testing were thus 4.8% ($n = 62/1295$) among all patients who used express testing, 4.6% ($n = 57/1241$) for urethral chlamydia, 0.08% ($n = 1/1241$) for urethral gonorrhoea, 2.2% ($n = 2/92$) for pharyngeal infections (all chlamydia), 3.3% ($n = 2/60$) for rectal infections (one chlamydia and one gonorrhoea) (See Table 1).

In comparison, test results from the asymptomatic patients ($n = 334$) who were 'let-in' due to increased clinic capacity yielded an overall STI diagnosis rate of 8.1% ($n = 27$): four with syphilis, 13 with urethral chlamydia, two with urethral gonorrhoea and eight with cervical chlamydia. Since these patients were asymptomatic, before implementing express testing, all would have been denied services and instructed to return another day (Mercer et al., 2007; White et al., 2005).

Discussion

Due to capacity issues in our STI clinic, we implemented express testing, which is a streamlined testing service wherein patients complete an STI self-assessment and see a nurse for specimen collection; no examinations occur. In the first year of express testing, we identified that 20% of the patients who sought STI testing were eligible and 90% agreed to use it. The outcome was increased access. A number of STIs were identified among those who both underwent express testing and those who were 'let-in' due to an increased capacity for service delivery. We did not identify any blood-borne infections (HIV, hepatitis B, C).

This identification of chlamydia and gonorrhoea cases suggests that express testing is useful both for service delivery and identification of STIs among patients without

symptoms. Based on the prevalence of these infections and that chlamydia is routinely asymptomatic, our results are unsurprising. In 2014 in Ottawa, there were 2581 cases of chlamydia, 324 cases of gonorrhoea, 44 cases of syphilis and 56 cases of HIV (Public Health Ontario, 2018a). Thus, while express testing identified no cases of syphilis or HIV, it did account for 2.3% ($n = 60/2581$) of all chlamydia cases, and 0.6% ($n = 2/324$) of all gonorrhoea cases across our city.

By increasing access to testing among asymptomatic patients, enhanced screening was possible, both among patients who used express testing and those who we 'let in' due to increased capacity. In the context of increasing rates of gonorrhoea and chlamydia across Canada and the USA (Dombrowski and Golden, 2013; Fernando and Thompson, 2013; Knight et al., 2013; Rukh et al., 2013; Xu et al., 2013), increasing access can be an important way to prevent onward transmission. As seen in the UK, many patients who present to STI clinics do not return when turned away, and consequently transmit their infection(s) to others. The outcome is an increased number of persons with STIs and further demands on health services that were unable to meet service demands in the first place. Express testing, in which people are streamlined to faster screening services may be one way to addres such ongoing STI transmission. Our identification of 27 STIs among patients who were 'let-in' (with four of these infections being syphilis) highlights the need to increase access to STI testing among patients who are denied care for capacity reasons.

Our findings also suggest that the screening criteria we used likely reduced the probability a patient would have an STI or HIV, although not eliminating this possibility, especially for chlamydia (likely related to its prevalence and that it is often asymptomatic). Compared with baseline values from 2013, wherein the positivity rate for chlamydia was 5.9–6.1% and gonorrhoea was 0.72–0.81% (O'Byrne et al., 2016), our criteria reduced the possibility that a patient had an STI. For gonorrhoea, being eligible for express testing corresponded with a 10–11 times lower positivity rate for gonorrhoea (compared with the 2013 rates in our clinic) and a 25% reduction in the probability of chlamydia infection (compared with 2013 rates in our clinic). This suggests that our screening criteria cannot rule out STIs but correspond with a reduced likelihood of infection.

These results suggest that express testing can be an important health systems intervention, in that it uses available healthcare professionals to their full scope. Nurses, who are already licensed to perform examinations, can be authorised through medical directives to perform STI/HIV screening, as indicated based on their assessments, which allows additional time for prescribing practitioners (physicians, nurse practitioners) to examine patients and provide treatments as needed. From our express model, no adverse events were identified, nor did patients complain about satisfaction (although no formal evaluation occurred). Martin et al. (2013) did previously identify patient satisfaction complaints with this form of testing, but this appeared to relate to the computer intake process, not the testing procedures.

Lastly, our results need to be interpreted with caution. Study limitations include that it occurred in a single clinic involving nurses, nurse practitioners and physicians. In contrast to prior studies on express testing (Fernando and Thompson, 2013; Knight et al., 2013; Rukh et al., 2013), in our study unregulated health providers were not involved in assessments, screening or specimen collection processes. The ability to elicit patient information and appropriately screen patients is likely different when performed by nurses. Additionally, clinical services where this study occurred are free and do not require payment at the point-of-care or for specimen processing. Different results could arise were insurance a point of consideration. As well, the positivity rates for our extragenital tests (pharyngeal

and rectal) may have been artificially lowered by the poor sensitivity of the testing modality we used (i.e. culture). Had NAAT been available (as was the case for the urine testing), more infections may have been detected, which would have limited the pronounced reduction in infections identified among our express cohort (Public Health Ontario, 2018b). We used this culture testing because NAAT was not licensed for laboratory use at that time. Notably, it is now, with the sensitivity of an extragenital chlamydia culture, compared with NAAT, being as low as 20% (Public Health Ontario, 2018b). With increasing availability of NAAT testing, the values found here will likely change.

Conclusion

These data highlight the utility of express testing. Although it increased service capacity only modestly, it did so without requiring additional resources, and it effectively identified STI diagnoses among asymptomatic patients. In clinical settings with elevated pre-test probability for STI/HIV diagnosis, express testing can be useful. We feel our results should encourage other STI/HIV clinics to consider implementing express testing to increase access to care and hopefully help reduce the population burden of these infections.

Key points for policy, practice and/or research

- Service demands have increased for many STI testing clinics, without corresponding increases in clinical service resources.
- One strategy to address this situation is express testing, in which patients receive streamlined testing services, without physical examinations.
- Express testing can increase service capacity and can identify infections as well.
- Nurses can safely and expeditiously perform express testing.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethics

The Research Ethics Board at Ottawa Public Health approved this project.

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ORCID iD


Patrick O'Byrne http://orcid.org/0000-0002-0587-1409

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Patrick O'Byrne RN-EC PhD is an associate professor of Nursing at the University of Ottawa, and a practising Nurse Practitioner at the Sexual Health Clinic in Ottawa. His research and clinical work focus on the prevention, testing, diagnosis, and management of sexually transmitted infections, including HIV. He holds a Research Chair in Public Health & HIV Prevention.

Lauren Orser RN MScN is a Public Health Nurse with the Infectious Diseases Case Management team at Ottawa Public Health. She holds a Master's degree in Nursing, which included a capstone project that focused on the diagnosis and management of infectious syphilis.