



Improving management of sexually transmitted infections in primary care: feasibility and acceptability of a new patient management tool for clinicians

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ABSTRACT

INTRODUCTION: Routinely following an evidence-based clinical pathway of care for bacterial sexually transmitted infections (STIs) such as chlamydia or gonorrhoea is important to help reduce the spread of infections, prevent reinfections and avoid associated health complications.

AIM: To develop an easy-to-use tool for routine use by primary care clinicians to ensure best practice management of patients tested for and diagnosed with chlamydia or gonorrhoea.

METHODS: The tool (a MedTech Advanced Form) was developed in consultation with seven primary care clinicians and included different tabs for use during the STI care pathway (testing, treatment, advice, partner notification and follow up) with clickable links to relevant online resources. The tool was trialled over 3 months by 19 clinicians in three Wellington primary care clinics – two youth health and a student health service. Outcome measures were frequency of use, completeness of fields related to best practice care and clinician acceptance of the tool (from focus group feedback).

RESULTS: The tool was used for approximately one in four patients who were tested during the trial period, with ‘forgetting’ reported as the most common reason for non-use. Clinician views about the tool were favourable, with most indicating they would like to continue use and would recommend it to colleagues. Documentation of best practice care was excellent; fields to record reasons for testing, discussion of sexual history, provision of treatment and advice given were used for most patients for whom the form was completed.

CONCLUSIONS: Inclusion of this STI management tool in the electronic patient records system appeared to improve primary care clinicians’ delivery and documentation of best practice sexual health care at a practice level. Wider use of a modified version of this tool could facilitate more comprehensive best practice management of bacterial STIs.

KEYWORDS: Best practice management; *Chlamydia trachomatis*; *Neisseria gonorrhoeae*; primary care clinicians; sexually transmitted infections.

Introduction

Ongoing high rates of bacterial sexually transmitted infections (STIs) continue to contribute to a substantial but preventable burden of morbidity in New Zealand. *Chlamydia trachomatis* and *Neisseria*

gonorrhoeae are the most commonly diagnosed bacterial STIs¹ and are often asymptomatic.^{2,3} Symptoms vary by sex and anatomical site of infection and may include vaginal discharge or intermenstrual bleeding, cervicitis, abdominal or

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WHAT GAP THIS FILLS

What is already known: Best practice sexual health guidelines, including partner notification, are often not systematically followed for people tested for, and diagnosed with bacterial STIs in New Zealand primary care practices.

What this study adds: Inclusion of an easy-to-use STI management tool in the electronic patient record system appears to improve primary care clinicians' delivery and documentation of best practice sexual health care at the practice level.

pelvic pain, urethritis and testicular pain.^{3,4} Regardless of whether symptoms are present, untreated infections can result in long-term complications including pelvic inflammatory disease, ectopic pregnancy and infertility; they can be passed on in pregnancy or during delivery and increase the risk of HIV acquisition and transmission.^{5,6}

Gonorrhoea is on the 'deadliest superbug list' of the World Health Organization because of increasing concerns about antimicrobial resistant strains that are harder to treat or resistant to known antibiotics.⁷ Testing at-risk asymptomatic individuals with extragenital sampling (pharyngeal and anorectal) where indicated by patient sexual history, is an important way to diagnose infection and reduce the risk of complications. With rising rates of syphilis both in New Zealand and internationally,⁸ offering opportunistic testing for syphilis and HIV at the time of chlamydia and gonorrhoea testing is also recommended.⁹

Young people (particularly rangatahi Māori and Pasifika youth), low-income communities and men who have sex with men are disproportionately affected by STIs.¹⁰ These inequities persist despite highly effective antibiotic treatment and best practice guidelines that outline an evidence-based pathway of care, including partner notification and follow up for treatable bacterial STIs such as chlamydia or gonorrhoea.¹¹ These guidelines should be universally applied to the management of STIs with sampling from appropriate anatomical sites as guided by patient sexual histories, timely and appropriate antibiotic treatment, advice about reinfection risk reduction and the importance of treating partners, post-treatment phone follow up and a 3-month test of reinfection.¹¹

Despite evidence that effective clinical management helps to reduce the spread of infections, prevent reinfections and avoid associated health complications,^{12,13} international research has not yet been able to demonstrate how best to achieve routine best practice management.¹² Our past research has found that poor documentation and gaps in care along the STI management pathway are common in primary care – the setting in which the most cases are detected in New Zealand.^{14–16} A review of primary care case-notes for patients diagnosed with bacterial STIs revealed that only 50% had any documentation of their recent sexual history, 65% had documented evidence of a partner notification plan, and 20% had documentation that partners had been notified.¹⁴ Multiple studies have now shown that the recommended 3-month test of reinfection following chlamydia and gonorrhoea treatment is also low.^{15,17,18}

Competing demands on clinicians' time and lack of practice-wide systems and resources for clinicians are some of the factors limiting routine delivery of best practice care.¹⁶ Multiple health encounters are typically needed for the full cycle of STI care. These often involve multiple members of the primary care team, so documenting relevant sexual history, partner notification management and a follow-up plan are key to ensuring patients receive appropriate and seamless care.^{11,19} Primary care survey respondents recognised that gaps existed in their practice and strongly agreed that practical strategies could help facilitate provision of best practice care, including 'reminders to discuss partner notification and retesting', 'what to say and document' and 'printable resources for patients and their partners'.¹⁶

The current feasibility study was undertaken to address some of these gaps by developing and then trialling an electronic patient consultation tool to provide a framework for delivery and documentation of best practice care. The tool focused on chlamydia and gonorrhoea as the most common bacterial STIs, but included prompts to consider other STI testing where appropriate. To determine whether the tool would work in the context of a future intervention study, we first sought to collect data on the acceptability and functionality of the tool in a small number of settings.

Methods

Study design and participants

Seven Wellington primary care clinicians (sexual health advisor, nurses, nurse practitioner, general practitioner (GP)) participated in phase 1 (development of the patient consultation tool) and 19 clinicians (14 nurses, two nurse practitioners and three doctors) participated in phase 2 (3-month trial of the tool). The trial ran in three primary care clinics in the Wellington region (two youth health and one university student health clinic) with all nursing staff and 3 of 13 GPs from these clinics taking part. Ten GPs, including locums and very part-time doctors, in the three clinics did not participate. Based on our past research involving these clinics, we expected a minimum of 300 patients to be tested for chlamydia and gonorrhoea and 30–40 cases to be diagnosed over 3 months.¹⁴

Outcome measures

Frequency of tool use was measured by the proportion of individuals who had any data entered and were tested during the study period.

Use of key best practice fields were measured for patients diagnosed. This included counts of the tool components: reason for testing, recent sexual history, treatment given, partner notification plan made, treatment compliance and risk-reduction advice given, and advice to return for a 3-month test of reinfection.

Acceptability of the tool to participating clinicians was assessed from focus group feedback.

Phase 1. Development of the STI patient management tool

Primary care clinicians helped to develop a tool that sat in the MedTech electronic patient records system (referred to as the patient management system (PMS); see Supplementary Figure S1). It was designed to closely follow New Zealand Sexual Health Society's (NZSHS) best practice guidelines for STI screening and subsequent management of chlamydia or gonorrhoea¹¹ and was designed to be inclusive of all genders, sexualities and sexual practices. We met with each clinician one to three

times over 3 months to reach agreement on content, field types, response options, order and layout (totalling ~20 h of clinician input).

Each form (containing four tabs) could be used for the complete pathway of care with relevant fields (testing, diagnosis and treatment, and follow up) completed as appropriate at different consultations by different clinicians. Information entered automatically populated patients' daily records. A resources tab was included with clickable links to relevant NZSHS best practice guidelines,¹¹ HIV pre-exposure prophylaxis (PrEP) eligibility criteria²⁰ and two recent Best Practice Advocacy Centre (BPAC) articles.^{8,21} Additional information was accessible when hovering over underscored text on the form (when to consider a test of cure, throat and anorectal swabs, syphilis and HIV testing). A consultant with expertise in building advanced forms was contracted to build the form and provided instructions for participating practices to run the installation.

Phase 2. Trialling the tool in primary care

The researchers met with participating clinicians to explain how and when to use the tool, with an accompanying 'user guide' left for reference. Clinicians were asked to use the tool routinely when testing for or treating chlamydia and gonorrhoea, with no exclusions specified. They were free to introduce the tool (or not) to patients in any way they deemed appropriate, but it was left to their judgement to determine whether they used it.

Data collection and analysis

One of the research team members visited clinics to collect outcome measures data 3 months after the trial period concluded. A MedTech query identified patients for whom the advanced form had been completed and screenshots were taken of completed forms. Screenshots were saved into a Word document (Microsoft Corporation) for analysis; they did not include clinicians' names or any patient identifiers (names, National Health Index (NHI) codes, dates of birth, phone numbers or addresses).

Data from screenshots were entered into an Excel spreadsheet (Microsoft Corporation) to record

whether each field in the tool had been used. Frequency of use was collated for each field and total numbers and percentages calculated for fields related to main outcomes. Field content was not analysed. Clinics also ran a query to count numbers of patients tested and diagnosed with chlamydia and gonorrhoea during the trial period. This information gave us an estimated denominator from which we calculated the frequency of use (outcome 1: proportion of patients tested or diagnosed for whom the form was used).

Two members of the research team held focus groups with participating clinicians at the end of the trial to assess acceptability of the tool. A short questionnaire was administered to participants followed by an audio-recorded group discussion lasting 30–45 min to seek views on the benefits and drawbacks of using the tool, and ways it could be improved for future use. In the questionnaire, participants were asked to indicate whether they agreed or disagreed with 10 statements presented about the layout, content, ease of use, likelihood of continued use and recommendation to others. The audio was selectively transcribed to identify key comments.

The University of Otago Ethics Committee (Health) approved phase 1 on 18 December 2018 (Ref D18/423) and phase 2 on 24 July 2019 (Ref H109/097).

Results

Frequency of use and completion of best practice fields

The testing tab was completed 139 times for an estimated 528 patients (26%) tested during the trial period (this denominator includes test requests from the 10 clinicians who were not part of the trial so underestimates use by participating clinicians). The treatment tab was used 23 times for an estimated 63 patients diagnosed with chlamydia or gonorrhoea during the study period (equating to 36.5% of all patients diagnosed, and 82% of patients with the testing tab completed who returned a positive diagnosis). The follow-up tab was completed only five times. Table 1 presents the frequency with which fields were completed in each of the three tabs.

Reasons for testing and recent sexual history were completed for all patients who had a form completed (139/139), treatment fields were used for 21 of the 23 positive cases and a partner notification plan completed for 21 of 23 positive cases. Treatment compliance and risk-reduction advice, and advice to return for a 3-month test of reinfection were documented for 20 of 23 cases. Only one of the three clinics routinely makes post-treatment follow-up phone calls, but the nurse responsible for managing these reported continued use of paper forms (having forgotten follow up was included in the tool).

Acceptability of the tool

Data collected in the questionnaire regarding use of the tool are presented in Table 2 for 19 participating clinicians. Of clinicians who had used the tool, estimated frequency of use ranged from 1 to 40 times, summing to 160 times (a slight overestimate of the 139 times it was actually used). Only three clinicians thought the tool increased the duration of their consultations, but none indicated this deterred them from using it. Most participants reported using the tool sometimes or most of the time, with 'forgetting' cited as the main reason for non-use (Table 3). Overall responses to the questionnaire were favourable: 80% of participants said they would like to continue using it and 73% indicated they would recommend the tool to a colleague.

Key themes identified from focus group discussions about using the STI tool are presented in Table 4. Advantages of using the tool included: efficiency, promotion of more comprehensive best practice care ('gold standard care'), more complete and consistent documentation, improved continuity of care, and provision of educational and upskilling opportunities (particularly for new staff). Clinicians also thought it helped to 'normalise' the conversation about sex with their patients (eg when patients were told that every patient is asked the same questions) and highlighted the importance of sexual health.

Most comments made about negative aspects of the tool related to limitations of MedTech advanced forms and their functionality. For example, clinicians commented on closely spaced layout, small

Table 1. Number and percentage of patients for whom best practice aspects of care were completed in the tool for each step of the STI care pathway

Fields completed in each tab of the tool	N (%) times completed	
	n	%*
Tab 1. Reason for testing, sexual history [total]	[139]	
Reason for testing	139	100
Symptoms	87	62.6
Recent sexual history completed	139	100
Types of sex	137	98.6
Condom use	133	95.7
Type of sample collected	129	92.8
Plan for results	108	77.7
Number with a positive result	28 [†]	20.1
Tab 2. Treatment, partner notification, advice [total]	[23]	82.1
Treatment date	21	91.3
Treatment given	21	91.3
Partner notification plan	21	91.3
Resource given (Info sheets)	6	26.1
Treatment compliance and risk-reduction advice given	20	87.0
Advice about 3 month test of reinfection	20	87.0
Tab 3. Follow-up post treatment [total][‡]	[5]	21.7
Treatment compliance	5	100
Partner notification progress	3	60
Risk reduction advice	2	40
Reminder about 3 month test of reinfection	5	100

*For each section in the table (Tab), percentages reflect the frequency with which relevant fields were completed for those with any data recorded in a given tab. Denominators used are the [total] number of times the Tab was completed (ie Tab 1 denominator is 139, Tab 2 is 23 and Tab 3 is 5).

[†]Includes one patient who tested positive for Trichomonas.

[‡]Only one of the three clinics routinely makes post-treatment follow-up phone calls.

font of text populating the daily record (a default setting that could not be changed), inability to place a link to the form where it could easily be seen and 'roundabout' way of accessing the form in the PMS. Other drawbacks related to individual consultation style (eg preference to face the patient during a consultation rather than typing on the computer), and challenges using the tool in broader consultations (eg long-term contraception, cervical smears or infections like thrush and bacterial vaginosis). Several clinicians wondered how patients felt about being asked about numbers of recent partners and types of sexual activity, but noted that no patients refused to answer these questions.

Discussion

Use of this tool reportedly promoted more comprehensive and complete management of STIs at the study practices and prompted consistent and complete documentation of care. Clinician views towards the tool were favourable; most indicated they would like to continue using it and would recommend it to colleagues. Documentation of best practice care was excellent, with most clinicians using the fields provided to record reasons for testing, discussion of sexual history, provision of treatment and advice given. Closer alignment with 'gold standard' care¹¹ was identified as a benefit of

Table 2. Clinicians self-reported use of the STI management tool

Feedback from participating clinicians (n = 19)	n	%
Frequency of STI tool use		
Most of the time	7	36.8
Sometimes	7	36.8
Never	4	21.1
No response	1	5.3
Reasons for non-use		
Not appropriate	2	13.3
Forgot	10	66.7
Chose not to use	2	13.3
Other reasons*	4	26.7
Impact on consult duration		
No impact	11	73.3
Shorter	1	6.7
Longer	3	20.0
Covering in more detail	1	33.3
Unfamiliar with tool	2	66.7
Accessed links to		
NZSHS and other clinical guidelines	6	40.0
Websites for patients (eg www.Justthefacts.co.nz)	5	33.3
Brief reminders on best practice steps (pop-up text)	5	33.3

*The following reasons were given for non-use on the questionnaire: On leave (n = 1); followed form but did not complete it (n = 1); No access to Medtech at outreach clinic (n = 1); part-time worker and no STI patients seen (n = 1). While retrieving screenshot data at one clinic, other reasons mentioned to the researchers for non-use were: patient changed clinics part-way through the care pathway, patients presenting for treatment had initially been seen by a non-participating clinician or at another clinic (eg After Hours or ED) so had no Tab 1 information; therefore, participating clinicians chose not to use the tool partway through the care episode.

Table 3. Clinician agreement with statements presented to gain an understanding of views on layout, content and ease of use*

Statements seeking views on different aspects of the STI management tool	Agree		Disagree		Neutral	
	n	%	n	%	n	%
It was easy to find the STI tool in MedTech	11	73.3	3	20.0	1	6.7
The fields were laid out in a logical order	12	80.0	2	13.3	0	0.0
There was enough space to document relevant information	9	60.0	3	20.0	3	20.0
Looking at the previously completed tab to see what had been discussed in the previous consult was helpful	8	53.3	1	6.7	6	40.0
Some of the fields were unnecessary	5	33.3	4	26.7	5	33.3
Some aspects of care were not covered	3	20.0	8	53.3	4	26.7
It was frustrating using this tool in my consults	0	0.0	11	73.3	3	20.0
I did not use the tool enough to become familiar with it	7	46.7	7	46.7	1	6.7
I would like to continue using the tool	12	80.0	0	0.0	4	26.7
I would recommend this tool to a colleague	11	73.3	0	0.0	4	26.7

*Denominator used for percentage calculations equates to the number of clinicians who reported having used the tool (n = 15).

Table 4. Perceived benefits of the STI tool identified by clinicians in focus groups

Theme	Selected comments made by participating clinicians
Aids efficiency	'Swifter than having to document everything.' 'I like how it goes into the documentation.'
Assists standardisation of care provided	'Young people are comfortable going through the form if they know that everybody gets asked the same questions, and some of them are quite personal.' 'I sort of gauge the questions based on the person, but that's making assumptions about what you think people do and don't do, so to blanketly ask everyone is better practice.'
Prompts more complete and consistent documentation	'You might ask the questions in the course of a consult but if you're really busy you may not write them down.' 'Standardised documenting good, at the moment all documenting in different ways.' 'The more information we get the better overall picture and plan we can make.'
Improves continuity of care	'Faster than reading notes and you can pick up where you know your colleague has left off.'
Normalises the conversation	'Having questions like 'Do you have sex with males, females, both' was a great reminder that not everybody has sex with the opposite sex. They felt comfortable with us asking. It really normalises the questioning.'
Promotes more comprehensive 'gold standard' care	'To me this is actually more of a gold standard sexual history that is often missing in the primary care setting.' 'Lots of good prompts to make sure we're asking everything about the different risks.' 'Excellent trigger to ask all the right questions.' 'We've increased the amount of STI bloods testing we do. It's certainly increased me asking every time.' 'Had a case of someone who had negative urine and positive oral, so if we'd not done the oral we would have just sent them on their way.'
Upskilling in sexual health-care delivery	'Particularly good if you don't work in sexual health all the time or are not familiar with asking all those questions.' 'I'm new here and haven't had a lot of experience with sexual health, it was all there for me to go through and tick off, so I definitely think it's a good option for new staff members.' 'It's really good for upskilling as I think the prompts are really educative for people in terms of what they should be asking.'
Highlights importance of sexual health	'Makes you stop and take the whole consultation seriously. Reminds you that it's a topic all of its own and you can't add it on to other stuff.'

the tool and it was regarded as improving continuity of care '...you can pick up where you know your colleague has left off'. This is an important consideration because STI management typically involves different clinicians over multiple encounters. Despite being acceptable to the clinicians trialling the tool, it was inconsistently used, with approximately one-quarter of patients tested having a form completed. Failure to remember to use the tool was the most common reason for non-use, an aspect of the tool that needs improvement.

The substantial element of end-user consultation is a strength of the study. The tool was developed in consultation with clinicians who are frequently involved in the management of bacterial STIs in response to gaps identified in our past research. Trial clinicians' feedback was positive overall, and provided clear information about the practicalities, benefits

and frustrations associated with use of the tool.

Similar tools have been developed for use in primary care (eg cervical screening), but to our knowledge, this is the first report about use of a customised tool for STI management in New Zealand.

The study was not designed to detect changes in clinical outcomes as a result of using this tool, but qualitative data suggested that during the study period, patients received more comprehensive care that aligned with best practice guidelines. We could not accurately estimate the proportion of patients who were tested and treated by participating clinicians and had a form completed. Technical challenges with MedTech meant that the data provided to us by participating clinics did not include the 'requestor' details we anticipated receiving, so the denominator of tests and positives rates included non-participating clinicians. Figures provided are

therefore an underestimate of the actual frequency of use. No patient feedback was sought in this study, but clinicians reported that patients were typically willing to provide information in more depth than they might have previously given (particularly with respect to sexual history) when they were aware that everyone was being asked the same questions.

To ensure sufficient data in the short project time-frame, practices were chosen for their known high rates of STI testing and diagnosis (primarily due to their youth populations). Further work is needed to determine the acceptability and utility of the tool in mainstream general practice where individual clinicians typically see lower numbers of patients with STIs. Several study clinicians who used it only a few times reported ‘unfamiliarity with the tool’ as a drawback – a similar experience might initially be expected in general practice. By contrast, a participant new to STI testing commented favourably on the role of the tool in providing a clear, easy-to-follow framework for guideline-based provision of care.

Numerous challenges were encountered before installation of the tool into the three participating practices. Researchers spent a substantial amount of time liaising with the Primary Health Organisation (PHO), practice managers, MedTech staff, a private IT provider and the software developer to enable installation in the practices. Funding did not allow development of the tool for more than one patient management system, so only clinics using MedTech 32 were able to participate.

This study highlights the potential for health benefit that could accrue with the introduction of technology-based resources to assist clinicians in their routine delivery of best-practice sexual health care. With minimal intervention, clinicians self-reported delivery of best practice improved by taking more thorough sexual histories, more frequent consideration of syphilis serology and extra-genital swabs. Minor suggested changes to the tool design, mostly related to content, could easily be incorporated into a revised version, but a clear limitation of the tool was its lack of immediate visibility in the PMS and reliance on clinician memory to initiate use. A solution might be to include a prompt for completion of the tool upon generating a laboratory request for STI testing. However, differences in clinician consultation style

might present challenges for the timeliness of such a reminder as laboratory tests requested should ideally be informed by sexual history assessed while completing the tool. Secure web-based applications are now being used by some PHOs that can be integrated into any PMS and customised to support clinical decision-making. The cost of such a product was prohibitive for the current research, but it would enable development of a more sophisticated tool that could be integrated across multiple platforms, with inbuilt capacity to prompt use for relevant consultations.

Although problems encountered in this feasibility study are likely solvable, they would require buy-in from PHOs and laboratories as well as clinician education and widespread roll out to make a difference at a population level. The rapidly embraced new ways of working in primary care in the face of Covid-19²² might accelerate readiness for, and acceptance of such technology-based resources in future.

Use of this innovative STI management tool appeared to prompt clinicians to take a more thorough approach to documentation and management of patients tested for, and diagnosed with bacterial STIs. With minor modifications to the content and use of a more flexible platform, further evaluation of this tool in general practice settings is warranted. Widespread use of such a tool to promote comprehensive STI case management in primary care could ultimately contribute to a reduction in STI prevalence and associated health consequences.

Competing interests

The authors have no competing interests to declare.

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