

Gonorrhoea Diagnosis and Management in Primary Care in Ireland

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The Irish College of General Practitioners

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Executive Summary

Aims and objectives of study

The aim of this study was to describe a purposive sample of Irish General Practitioners' current practice in relation to the diagnosis and management of gonorrhoea in primary care and their views in relation to the diagnosis and management of gonorrhoea in primary care.

Specifically, the objectives of this study were to:

- a. Document current practice in relation to the management of patients with symptomatic and asymptomatic gonorrhoea infection, as reported by GPs in a recent ICGP STI survey.
- b. Identify any particular issue(s) of concern to GPs – (e.g. sexual history taking, discussing diagnosis, discussing treatment, test of cure, partner notification etc.).
- c. Describe GPs' current views and experience in referral of cases to specialist services – availability, communication, costs etc.
- d. Describe GPs' level of awareness and knowledge on AMR gonorrhoea – clinical presentation etc.
- e. Identify GPs' views on how best to achieve optimal management of cases diagnosed in primary care.

Methods

The study employed a mixed method study design to meet the objectives. The design consisted of analysis of existing survey data, a literature review and qualitative interviews with a purposive sample of GPs. Ethical approval for the study was obtained from the ICGP Research Ethics Committee in February 2015. A survey entitled "Testing for STIs in General Practice in Ireland" was undertaken by the Irish College of General Practitioners (ICGP) in 2012; the response rate was 58.4% and the respondent profile was consistent with that of the full ICGP membership population. A purposive sample, for the qualitative component of the study, included GPs with varied experience in managing cases of gonorrhoea in the Republic of Ireland. An email was sent to 30 GPs known to be involved in the provision of reproductive and sexual health services in June 2015. A total of seven completed telephone interviews were included in the final analysis. All interviews were audio recorded and transcribed verbatim. To protect participants' identities, all qualitative data were anonymised and no references are made to individual names or locations in this report. Data were stored in accordance with the Data Protection (Amendment) Act 2003.

Summary of quantitative findings

- Of 292 respondents of the Testing for STIs in General Practice in Ireland Survey (2012), just over 76% reported that STI testing and screening was provided in their practice.
- Less than 6% of respondents referred asymptomatic patients to a STI clinic for testing and approximately 10% of respondents referred symptomatic patients onwards.

- In the previous 12 months, just over 70% of respondents sent a first pass urine for CT/GC.
- Slightly more than one-fifth of GPs charged private patients an additional undisclosed fee for CT/GC urine tests; approximately 11% of GPs charged GMS patients an undisclosed fee.
- Over 80% of respondents sourced their swabs for CT/GC testing from their local hospital free of charge. Nearly 16% of respondents received their swabs through the post from the National Virus Reference Laboratory (NVRL) and less than 1% paid a private company for swabs.
- Just over 75% of CT/GC swabs were sent to local hospital laboratories for analysis free of charge.
- Almost 30% of those GPs who provide testing had completed a Sexually Transmitted Infections Foundation (STIF) course.
- No financial incentive, lack of time, perceived lack of knowledge and skills and problems accessing testing swabs were the main barriers indicated by respondents to providing STI testing in their practice.

Summary of qualitative findings

- Participants did not routinely engage in active partner notification in their practice. However, all participants advised patients to inform their partners to visit their own GP or attend a STI clinic, referred patients to STI clinics for partner notification, or utilised a mixed approach to the above dependent on their relationship with their patient.
- Participants in this study identified some barriers to adequate testing for and management of gonorrhoea within general practice. GPs addressed the need for a national guidance document which outlines a clear approach for GPs, clinics and laboratory services.
- Easy to access, concise and clear reference guides and supports were welcomed by GPs to assist them in the diagnosis and management of gonorrhoea; with quick guides, flow charts and/or gonorrhoea 'management algorithms' identified as the most useful aids.
- All participants indicated that they had completed some form of additional training within the last eight years. However, some participants welcomed further education on the most appropriate swabs to use and send to laboratory services for the diagnosis of gonorrhoea. It was identified that practice nurses should also receive further training in this area.
- Most participants interviewed did not have any experience with the clinical presentation of AMR gonorrhoea.
- Participants faced complex localised and varied challenges in the testing and management of gonorrhoea. Some encountered challenges when referring patients to their local hospital for treatment; while others, were keenly interested in treating and managing their patients personally, however were requested by their local hospital to refer all patients forward at all times.

- Participants addressed the need for payment for GP services as the current GMS contract does not cover taking and sending samples for STI testing.
- The ICGP and relevant parties are considering these findings and what actions need to be taken from this report.

Conclusion

The ICGP and relevant parties are considering these findings and the actions which need to be taken from this report. The findings of this study suggest testing in primary care is the most appropriate and easily accessible site for patients for the testing and treatment of gonorrhoea, provided that GPs receive suitable support. The results of this study provide corroborating evidence that GPs consider a need for guidelines on testing, diagnosis and the suitable treatment of gonorrhoea cases. Guidelines should address the importance the problem of AMR gonorrhoea. STI testing should be included in the GMS contract, to ensure there is no financial barrier to GPs doing STI testing.

Introduction

Gonorrhoea is a bacterial sexually transmitted infection (STI). In the Republic of Ireland, national surveillance data confirmed that 1187 cases were reported by week 34 in 2016; compared to 774 cases by the same period in 2015 (HPSC, 2016). Between 2009 and 2014 the notification rate of gonorrhoea increased by 200% (HSPC, 2015). In HSE-East alone, between 2003 and 2012, there was an almost eight fold increase in the number of gonorrhoea notifications (Cooney, 2016). This situation is considered to be a major public health concern. Young adults (aged 20-24 years) and men who have sex with men (MSM) have the highest risk of infection. Rising rates of gonorrhoea may be linked with a number of factors including the availability of more sensitive diagnostic tests (NAATS), increased testing of extra-genital sites in MSM, increased routine STI screening and a rise in unprotected and unsafe sex.

Presentation and challenges

Gonorrhoea is caused by the bacterium *Neisseria gonorrhoeae* (*N. gonorrhoeae*). Transmitted through unprotected sex, gonorrhoea can infect both men and women. It most commonly infects mucosal surfaces of the genitourinary tract, rectum and pharynx (Barlow and Phillips, 1978; Sherrard and Barlow, 1996) The infection can be both symptomatic and asymptomatic. In symptomatic cases, symptoms usually appear within two weeks, but can develop more than thirty days post initial infection. When present, signs and symptoms of urethral infection in men include dysuria or a white, yellow, or green urethral discharge. In cases where urethral infection is complicated by epididymitis, men with gonorrhoea may also complain of testicular or scrotal pain. However, figures suggest that up to 86% of women and 55% of men do not experience any apparent symptoms after contracting gonorrhoea (Fitzgerald, Igoe and Cooney, 2013; F; Cooney, 2016). Asymptomatic cases can delay treatment for a considerable period of time which may result in serious complications and further transmission of the infection during unprotected sex. If left untreated, it can lead to pelvic inflammatory disease, ectopic pregnancy, first trimester abortions and infertility in women. In men, it can lead to epididymo-orchitis or prostatitis. Both men and women can also develop pharyngeal gonorrhoea, which has a very low rate of reported symptoms, and gonorrhoea infection of the eyes. The delayed diagnosis of such can lead to serious sequelae. Gonorrhoea can also infect new born infants via severe eye infections. Without treatment some cases of gonococcal infection may resolve spontaneously.

Recommendations for management of suspected or confirmed gonorrhoea

Swabs from possible sites of infection is a criterion standard for diagnosis. Tests include *nucleic acid amplification tests* (NAAT) and *gonorrhoea culture*. NAAT, usually run on urine samples or on swabs from potentially infected sites in the genitourinary tract, rectum and pharynx, detects the genetic material/nucleic acid of the bacteria causing the infection. Pharyngeal testing is not currently routinely recommended for all patients who have had unprotected oral intercourse but is recommended for MSM. Gonorrhoea culture is performed using a swab from the suspected area of infection, and where feasible should be carried out so that susceptibility testing can be performed (Bignell and Fitzgerald, 2011). As *N. gonorrhoeae* is a delicate organism, it should ideally be plated immediately and swabs must be promptly transported to laboratory services to reduce the risk of

false negative results. Culture is not recommended for the diagnosis of all cases as NAAT is generally more sensitive than culture, however culture should be taken where possible from patients with NAAT positive results before a prescription is provided. False positive results can occur with NAAT tests particularly in low prevalence populations (Palmer et al., 2003; Field et al, 2014). To overcome this, there are laboratory recommendations in place to confirm positive NAAT results (BASHH, 2014). Patients with suspected or diagnosed gonorrhoea should be offered screening for additional STIs by suitably qualified personnel either in the primary care setting or at a STI clinic. Partner notification (also known commonly as contact tracing) should also be instigated. A test of cure should be obtained within two weeks after completion of antibiotic therapy. If persisting symptoms or signs are still evident, urgent referral for clinical assessment by an STI specialist must be made and swabs for culture taken to test for antimicrobial resistance.

Antimicrobial resistance

Gonorrhoea is usually treated and cured with one of several antimicrobials, however the bacterium *N. gonorrhoeae*, considered to be a superbug, has proven to rapidly develop resistance to common and often over used antibiotics previously utilised for first-line treatment (Chisholm et al., 2010; Unemo and Nicholas, 2012; Ison et al., 2013). Antimicrobial resistance (AMR) in *N. gonorrhoeae* has to date been shown to penicillins, tetracyclines, macrolides, sulphonamides, and quinolones (WHO, 2012). Recent data recoded by the World Health Organisation shows that *N. gonorrhoeae* also has the ability to develop resistance to cefixime the extended-spectrum cephalosporin have been the foundation of recommended treatment for gonorrhoea (Unemo and Nicholas, 2012; WHO, 2012); with several countries including France, Japan, the UK and Australia reporting cases of resistance to cephalosporin antibiotics. Cefixime resistant gonorrhoea has also been diagnosed in Ireland and is increasing in incidence (Guidelines for Antimicrobial Prescribing In Primary Care In Ireland, 2016). The emergence of multi-drug resistant gonorrhoea has resulted in significant complications in successful treatment, leading to reduced treatment options. Contributors to multi-drug resistance in *N. gonorrhoeae* are thought to be over prescription and inappropriate selection of antibiotics, as well as natural genetic mutations within disease organisms (WHO, 2012). In Ireland, two cases of high level azithromycin resistant cases have been reported (Lynagh et al., 2015). Culture remains essential for determination of antimicrobial susceptibility and surveillance and for the detection of emerging resistance. It has been recommended that testing for ceftriaxone and azithromycin susceptibility must be included in all routine antimicrobial susceptibility testing. International action plans, such as the WHO global action plan (WHO, 2012) and the European Centre for Disease Prevention and Control (ECDC) response plan (ECDC, 2012) stress the need for global AMR surveillance and national gonorrhoea management guidelines outlining where necessary the use of dual antimicrobial therapy and public and health care professional information campaigns (Bignell and Unemo, 2012).

Table 1. Recommended Treatment of Gonorrhoea

| | |
|----------|--|
| 1 | CEFTRIAXONE 500mg as a stat i.m injection plus AZITHROMYCIN 1g orally stat in accordance with the BASHH guidelines (Azithromycin is given regardless of any Chlamydia results, to boost the Ceftriaxone) |
| 2 | Ceftriaxone 500 mg intramuscularly plus azithromycin 2g orally, in accordance with IUSTI guidelines |

Note: Test of cure is recommended for all cases

The role of the general practitioner

In Ireland, general practitioners (GPs) and practice nurses make an important contribution to the diagnosis and treatment of STIs. In 2013, enhanced surveillance on gonorrhoea notifications identified that in the HSE East, approximately one quarter of all gonorrhoea cases were diagnosed in primary care. In a review of all gonorrhoea notifications in the greater Dublin areas in the first three months of 2013, it was found that 44% of heterosexuals and 12% MSM cases were diagnosed in primary care (Fitzgerald, Igoe and Cooney, 2013). The appropriate clinical management of gonorrhoea, includes taking patients sexual history, testing appropriately (including extra-genital sampling where indicated), and where relevant treat cases, undertake a test of cure, follow-up on partner notification, or refer forward for treatment and partner notification. GPs also play an important role in prevention, through educating patients on safe sexual practice and appropriate protection, and contraceptive advice and provision. With a specific focus on the prevention of multidrug resistant gonorrhoea, the ECDC states that “clinicians have a crucial role in preventing the spread of antimicrobial resistance through appropriate clinical management, partner notification services, and reporting cases of treatment failure” (ECDC, p.g.7, 2012). In Ireland, gonorrhoea is a notifiable disease under the Infectious Disease Regulations (Infectious Disease Regulations, 1981); health care professionals and laboratory directors are required to notify any cases detected to the local Medical Officer of Health (local Director of Public Health or Consultant in Public Health Medicine), who then must notify the Health Protection Surveillance Centre (HPSC).

There is no consensus on whether the management of gonorrhoea should take place in general practice. While testing for asymptomatic and symptomatic gonorrhoea is deemed to be appropriate in general practice, referral to specialist STI clinics or *Genito-Urinary Medicine* (GUM) clinics may be necessary for culture, antibiotic sensitivity, management and partner notification for positive cases where facilities for these are not available in general practice. As yet, there are no dedicated, localised gonorrhoea guidelines in Ireland, and instead most clinicians refer to the British Association for Sexual Health and HIV (BASHH) UK gonorrhoea guideline (Bignell and Fitzgerald, 2011). These guidelines advise that patients diagnosed should be referred forward for treatment, test of cure and for culture tests, in order to ensure that adequate standards of care are met and as gonorrhoea is rapidly developing resistance to antibiotic therapies. As a result, GPs in Ireland may opt to follow this recommended process.

Response to the problem of gonorrhoea in Ireland

As a result of the increasing trends of gonorrhoea in the HSE East, a multidisciplinary Gonorrhoea Control Group was formed in 2012 to investigate and control the increase in gonorrhoea in Ireland. Furthermore, in May 2014 the Antimicrobial resistance in Gonorrhoea Sub-Committee of the HPSC Scientific Advisory Committee was formed to provide national guidelines for minimising the impact of AMR in *N. gonorrhoeae*, including prevention, surveillance and clinical management. This sub-committee has drafted national guidelines for the prevention and control of gonorrhoea and for minimising the impact of antimicrobial resistance. The consultation process has now finished, and the final version of the guidelines is due for release in late 2016. Since 2011, 10 cases of high-level azithromycin resistant (HL-AziR) gonorrhoea have been reported and monitored. Enhanced surveillance forms and additional tools to collect and collate and monitor HL-AziR gonorrhoea are currently in development by the HSPC.

Study rationale

There is limited recent evidence on the extent to which gonorrhoea is successfully diagnosed, treated and managed in general practice in Ireland, and on the appropriateness and quality of care received there. This small scale qualitative study focused on GPs testing and treatment experience of gonorrhoea, their level of training in the area of STI testing and management and their awareness of specific guidelines.

Methodology

Aims and objectives of study

The aims of this study were to:

- a. Describe current practice in relation to the diagnosis and management of gonorrhoea in primary care.
- b. Describe GPs' views in relation to the diagnosis and management of gonorrhoea in primary care amongst a purposive sample of GPs working in both the Dublin and rural Ireland areas.

Specifically, the objectives of this study were to:

- a. Document current practice in relation to the management of patients with symptomatic and asymptomatic gonorrhoea infection, as reported by GPs in a recent ICGP STI survey.
- b. Identify any particular issue(s) of concern to GPs – (e.g. sexual history taking, discussing diagnosis, discussing treatment, test of cure, partner notification etc.).
- c. Describe GPs' current views and experience in referral of cases to specialist services – availability, communication, costs etc.
- d. Describe GPs' level of awareness and knowledge on AMR gonorrhoea – clinical presentation etc.
- e. Identify GPs' views on how best to achieve optimal management of cases diagnosed in primary care.

Study design

The study consisted of a mixed method study design involving analysis of existing survey data, a literature review and qualitative interviews with a purposive sample of GPs.

A survey entitled “Testing for STIs in General Practice in Ireland” was undertaken by the Irish College of General Practitioners (ICGP) in 2012. The aim of the survey was to inform the ICGP of the STI services GPs provide in Ireland, including costs and barriers to provision. A postal survey and one reminder were sent to 500 GPs on the ICGP membership database; the response rate was 58.4% and the respondent profile was consistent with that of the full membership population.

Sampling, for the qualitative component of the study, was purposeful and aimed to include GPs with varied experience in managing cases of gonorrhoea in the Republic of Ireland. The sampling frame was responders to an email, sent in June 2015 to 30 GPs known to be involved in the provision of reproductive and sexual health services. Included with the email was an information sheet which informed potential participants of the details of the study including the purpose, process and data collection procedures. Participants were asked to indicate via email if they were interested in taking part in the study. A semi-structured interview topic guide was designed by members of the research team, informed by the literature.

The final interview guide consisted of 12 questions and prompts in five sections including testing, treatment, training, guidelines and future recommendations.

Telephone interviews

Conducting interviews via telephone are seen to be beneficial with regards to health related research. Previous research indicates that telephone interviews are an invaluable tool for exploring a sensitive topic as individuals may prefer to disclose information over the telephone rather than during face-to-face interviews (Carr and Worth, 2001; Chapple, 1999).

Additionally, telephone interviewing is a cost-effective method and is particularly useful when participants are geographically scattered (Chapple, 1999), which was the case for this study. Therefore, semi-structured telephone interviewing was considered the most effect method for qualitative data collection for this study.

Data analysis

A total of seven completed telephone interviews were included in the final analysis. All telephone interviews were audio recorded and transcribed verbatim. Using a thematic analysis approach, the interviews were checked for accuracy and cleared of any identifying information. The transcripts were read and then re-read, codes and categories were then identified in the interviews against an agreed coding framework developed by the research team and codebooks were generated. Additionally, any new codes that arose were included and analysed. Codes were then reviewed to assess the commonality and differences between the interviews. This helped to create a better understanding of the extent of the issues that had been raised.

Ethical considerations

Ethical approval for the study was obtained from the ICGP Research Ethics Committee in February 2015. All interested participants were provided with both email and verbal information about the research and prior to interview commencement were asked to provide verbal consent to be interviewed and have the interview audio recorded. Any questions pertaining to the study and participants' rights were answered by the researcher conducting the interview. Participants were reminded that they were free to withdraw from the study at any time.

No personal data identifying any person was recorded on the interview transcripts. To protect participants' identities, all qualitative data were anonymised and participants were assigned a code number. To ensure privacy, in this report no references are made to individual names or locations. Data were stored in accordance with the Data Protection (Amendment) Act 2003.

Findings

Testing for STIs in General Practice in Ireland Survey (2012)

Of 292 respondents, just over 76% reported that STI testing and screening was provided in their practice.

In asymptomatic females, 43.2% of doctors usually sent a first pass urine sample, and nearly 59% would usually send an endocervical swab to test for chlamydia (CT) and gonorrhoea (GC). Just over 5% of doctors would not send any tests but would refer to a STI clinic for tests. For CT/GC in asymptomatic males, 58.4% of doctors would send a first pass urine sample and 37.8% would usually send urethral swabs, and 5.9% would send no tests and would refer to a STI clinic for testing.

For symptomatic presentations in females, 36.8% of respondents would send a urine sample and 80% took swabs; whilst in symptomatic males, 56.2% would send a urine sample and 62.2% would take swabs.

Less than 6% of respondents referred asymptomatic patients to a STI clinic for testing. Numbers were slightly higher in symptomatic cases, with approximately 10% of respondents referring patients onwards.

Just over 70% (n=172) of respondents confirmed that they had sent a first pass urine for CT/GC in the previous 12 months.

Approximately 22% of GPs charged private patients an additional undisclosed fee for CT/GC urine tests; while nearly 11% of GPs charged GMS patients an undisclosed fee.

The vast majority (82.2%) of respondents sourced their swabs for CT/GC testing from their local hospital free of charge. Nearly 16% of respondents received their swabs through the post from the National Virus Reference Laboratory (NVRL). Less than 1% of respondents paid a private company for the relevant swabs.

Just over 75% of CT/GC swabs were sent to local hospital laboratories for analysis free of charge. In 16% of cases, the local hospital forwarded the sample to the NVRL; while nearly 8% of swabs were posted to the NVRL.

Almost 30% of those GPs who provide testing had completed a Sexually Transmitted Infections Foundation (STIF) course.

The main barriers indicated by respondents to providing STI testing in their practice were: no financial incentive (33.6%), lack of time (24%), perceived lack of knowledge and skills (18.5%) and problems accessing testing swabs (12.3%).

Respondents identified that financial incentives and training/primary care guidelines were primary necessities to help facilitate STI testing in their practice and to help further reduce referrals to STI clinics.

Qualitative findings

This section of the report highlights the qualitative findings of seven interviews conducted with GP participants. The following sample breakdown applied to the seven participants who engaged with this research:

- Four GPs offered screening but did not manage positive gonorrhoea cases, instead referred patients onwards for treatment [Group A]
- Two GPs offered screening and had some experience of managing cases [Group B]
- One GP managed at least five cases in the past five years [Group C]

Gonorrhoea screening practices

When asked about screening practices for asymptomatic patients, participants identified varied approaches in their practice in relation to testing. The majority of participants indicated that they would send NAAT only, however one participant explained that they would send culture only test dependent on their level of suspicion.

In cases of symptomatic testing, all participants indicated that they would send both a NAAT and culture test. One participant explained that:

“Generally we would try to do the NAAT and the culture if you were symptomatic and if you had some kind of a discharge you could pick up.” (GP4_Group A)

Another participant appeared to be confused about the swabs they use to test and the difference between NAAT and culture. However, this confusion did not adversely affect clinical outcomes as this GP always referred patients onwards for treatment. Their confusion is evident in the statement below:

“As a practice, we have dedicated NVRL chlamydia and gonorrhoea swabs which I presume are the ones for NAAT... they are not just normal bacterial swabs, they’re specific swabs for chlamydia and gonorrhoea and that allows culture. They just seem to occur through the NVRL (National Virus Reference Laboratory)... they do both. So you get an initial report.” (GP3_Group A)

Participants were asked to identify patients most at risk of contracting gonorrhoea. All identified those aged under 25 years, patients who travel overseas and men who have sex with men.

Sexual history and swab taking

Participants could be characterised as being proactive when initiating discussions to take notes on a patient’s sexual history. All participants asked a wide range of questions to guide their note taking and diagnosis including why their patient came in for screening, if they had any previous history of sexually transmitted infections in the past, types of intercourse they have had, if they use condoms during intercourse and if there are any risk factors in relation to current or previous partners.

“Like a sexual history?... why they are here, do they have any symptoms, then their sexual history in that non-judgemental way like men sleeping with men, women sleeping with women etc., how many partners had they had in the last six to twelve months, do they have a regular partner.” (GP3_Group A)

When discussing key barriers to talking to patients about their sexual history within primary care, participants referred to how lack of experience could make discussing the topic slightly difficult. However, participants noted that it became more commonplace the more they asked the relevant questions.

One participant informed us that they had completed an eLearning course on sexual health and found it particularly useful when it came to increasing their confidence in asking for a patient’s sexual history as in the past they commonly avoided asking relevant questions to guide swab taking:

“I am definitely better at doing that too since taking the eLearning thing because probably before that, I’ll admit that I probably didn’t go there...the eLearning thing that was a good learning curve.” (GP1_Group A)

All participants highlighted the range of swabs they take for both symptomatic and asymptomatic screening guided by their patient's sexual history. These include endo-cervical, oral, anal, urethra and high-vaginal. One participant indicated that they were unsure whether they *“should be doing pharyngeal or anal swabs on females who have a history of unprotected anal or oral sex as well”* – (GP5_Group B) as they currently did not.

Some participants also spoke of encountering barriers to swab taking including having to occasionally take urine if a patient *“really objects to having a swab done”* (GP4_Group A).

The necessity to take swabs from different sites in cases of MSM intercourse was also identified:

“For a heterosexual man I would just do a urethral swab if they have discharge or a first catch urine, first 10mls if they were asymptomatic. And then for MSM I usually do a pharyngeal, urethral and anal if they have a history of receptive anal.” (GP5_Group B)

Provision of treatment

Two participants reported that they undertake a test of cure within two weeks for patients who have been diagnosed with gonorrhoea. In contrast, three participants who offer screening but do not manage cases, and instead refer patient onwards for treatment, confirmed that their local STI clinic *“look after”* their patient including performing a test of cure. One participant who referred patients forward spoke of their interest in testing, treating and managing their patients personally but explained that they encountered a road block when the hospital in their area requested that they refer all cases of gonorrhoea to them.

“Again with the test of cure, we would be happy to do it but the hospital have asked us “look if you get a gonorrhoea case get them over”. I had a guy two weeks ago with oral, a man sleeping with men, he’s openly gay. I would have screened him for years and he has never had anything and then it comes in that he has and it comes in from (names hospital) that they want him back for test of cure at their own discretion.” (GP3_Group A)

Partner notification / Contact tracing

Participants reported varied approaches to partner notification, also referred to as contact tracing. Three of the participants encouraged, discussed and advised their patients on how best to undertake partner notification themselves, two GPs who referred patients forward to STI clinics to treat cases of gonorrhoea, reported that the clinic would always undertake partner notification, and two participants utilised a mixed approach depending on their relationship with their patient. For example, one participant noted that they would follow up on partner notification for their patients if their patient was willing to share details and had no concerns about possible confidentiality issues:

“If the patient is willing to give us numbers then we can do that for them but the STI clinic will do it either. It depends on whether the patient is comfortable with a local nurse getting in contact with partners, sometimes patients aren’t because it kind of makes tracing back to them easier locally.” (GP4_Group A)

Of the participants who do not undertake partner notification, both noted that STI clinics have better resources to follow-up for patients. Resources include the time to comprehensively follow-up with previous and current partners, improved abilities to manage patient confidentiality and varied counselling options for patients. In relation to confidentiality, some participants considered that *“confidentiality is really difficult because you don’t want to compromise any of your patients”* and that *“contact tracing is really difficult to do in primary care”* (GP2_Group A). One participant reported that in practice partner notification *“could be a sensitive issue to deal with so getting help with that (via STI clinics) may be a good idea”* (GP1_Group A).

Of the participants who encourage their patients to undertake their own partner notification, all reported that their patients were *“capable”* of undertaking the process themselves. They discussed how their patients would likely notify their partners themselves rather than seek help from the practice nurse or GP as illustrated by the following quotation:

“Our patients are I suppose more capable and if they want to contact trace then we will give them the information as in the process...the description of contact tracing, an anonymous and making them aware of the hazards of contact tracing. We discuss and advise on contact tracing. We don’t actively get our nurses to do contact tracing instead of the person because we will advise them on anonymous ways...” (GP3_Group A)

Referral process

Reasons for referring forward were clearly described by participants. These included encountering resistant gonorrhoea, access to partner notification, counselling services, and because some guidelines recommend that all cases should be referred to specialist clinics.

“I tend to refer all cases... to the STI clinic even if I’ve just treated them, for full contact tracing because they have more resources with the health adviser or the nurse who manages contact tracing and as far as I know the BASHH guidelines or any recent talks I’ve been to recommended that all cases of gonorrhoea are referred to an STI clinic.” (GP5_Group B)

One GP stated that confidentiality was a key reason why they referred patients forward, in some cases for both testing and treatment. They found that patients who have STI screening and/or treatment notes on their record can encounter issues later on when applying for insurance policies.

“Confidentiality is really difficult because you don’t want to compromise any of your patients... I know myself that some of that can come back due to insurance policies later on in life when you have somebody who comes in who wants to be health aware and get checked for STIs and make sure they’re safe before getting into any relationships and then a couple of years later they apply for life insurance and their notes come up saying that they’ve have STI screenings and other companies will then load them in terms of their policies which is an interesting thing that I’ve only come across in the last year or two.” (GP2_Group A)

Within this context, the above participant expressed particular concerns about trying to manage their patients’ medical needs whilst also trying to protect them from any future ramifications.

Participants who refer cases of gonorrhoea forward for treatment found the process mainly problem free. In some areas, STI clinics were open for anonymous walk-ins on certain days of the weeks, while in other areas clinics were open less during summer months. In the majority of cases, patients were seen within one week. Participants explained that if they had any concerns they could make a call to the relevant clinic.

“I mean if you’re really worried, you can always pick up the phone... Otherwise once you make the referral letter they’re (STI Clinic) pretty good about it.” (GP6_Group B)

However, one participant talked about an issue with the referral process to a number of hospitals in a busy urban area. They discussed how a patient’s referral notes were lost in the process and the clinic closed before the patient could be treated that day resulting in great upset. They considered that the process should be streamlined to create a less stressful situation for patients.

Awareness of AMR gonorrhoea

All but one participant, who referred cases forward for treatment, were aware of AMR gonorrhoea although most did not have any experience with its clinical presentation.

Some participants first became aware of the issue of multi-drug resistance when treating gonorrhoea during presentations by infectious diseases registrars and other medical professionals at medical events and meetings, whilst others learned of it when completing the ICGP eLearning course.

“Recently I just did the STI eLearning module with the ICGP but that again was really highlighting that antibiotics are running out of time.” (GP1_Group A)

One participant who always refers patients forward for treatment explained that they have some knowledge of how to treat AMR gonorrhoea however they do not have access to relevant drugs which is another component of why they refer:

“I am aware that they (patients) need IM ceftriaxone so I know that you can’t just treat with oral antibiotics anymore. Again because it’s IM ceftriaxone we wouldn’t really use that here which tends to be why we refer on to the STI clinic.” (GP2_Group A)

Another participant noted that AMR gonorrhoea is one of the reasons they refer patients for treatment. They explained that their laboratory services provide insufficient levels of detail to allow for optimal treatment:

“Well that’s why we always refer because lab’s services are too difficult. We use the virus reference lab so you only get back the positive, you don’t actually get back the sensitivities... we don’t have the information in that we don’t have sensitivity... we don’t have a good enough laboratory service to be confident in treating it properly” (GP4_Group A)

One GP with the most experience in managing cases of gonorrhoea talked about changing their practices in treating gonorrhoea based on updated information from the BASHH guidelines over the years. As a result, they now keep key drugs to treat AMR gonorrhoea in their clinics.

“Well we have been following the guidelines of BASHH over the years so we have changed our practice. We treat patients so we have Ceftriaxone in stock in the clinics.” (GP7_Group C)

Training

Participants were asked whether they had undertaken any additional training in STI testing and management. Beyond the training they received during their undergraduate degree and GP training, all participants indicated that they had completed some form of additional training within the last eight years. This includes a UK based Diploma in Reproductive Healthcare in Community Gynaecology, the STIF Foundation course (run in the Mater Misericordiae University Hospital Dublin), the BASHH Core and Core Plus courses, eLearning modules via the Irish College of General Practitioners (ICGP) website and STI masterclasses at the Royal College of Physicians and ICGP.

Training was considered to be beneficial, particularly for participants whose patient population profiles contained patients in high-risk categories or participants who had a particular interest in sexual health. One participant explained:

“...especially because I’m working in, primarily, in family planning and women’s health in (names city), we see men as well for STIs. Yeah I suppose that’s my main area of interest so I’ve done extra training which I’ve found useful because that’s the area I work in and I see more patients with that than say a normal GP would see.”
(GP5_Group B).

Two participants addressed the point that they had not undertaken any specific training, however, they kept up to date on BASHH guidelines.

Guidelines

The guidelines most commonly referenced by and used in practice by all participants were the UK BASHH guidelines. All participants clearly expressed that guidelines for the management of gonorrhoea in Ireland would be of great benefit to them. There was a suggestion that if such guidelines were developed, they would be pertinent and relevant. Some participants explained that Irish guidelines would be specifically useful to outline best practice:

“... in terms of follow up with an STI clinic if necessary or in terms of if there is going to be different antibiotic recommendations versus the UK with the BASHH guidelines.”
(GP5_Group B)

One participant also noted that guidelines in an Irish context would be extremely beneficial as they would be population specific. They went on to explain how clear guidelines would be of value for practices located in rural locations who may not have ease of access to laboratory services and local STI clinics.

“I think that if you are working locally it’s good to have local guidelines because they are specific to the population that you are working with... we are different in Ireland than they are in the UK... there are different approaches; it’s a different culture... I do think that where you are working that it would be good to have something to follow.”
(GP2_Group A)

There was a suggestion that without local guidelines GPs may be sharing incorrect information on gonorrhoea diagnosis and management with their peers. The potential to rely too heavily on support from their peers who may offer inconsistent information thus result in unsuitable treatment was addressed. An example was offered which highlighted the complexities of knowledge sharing:

“I suppose I would be in contact with the GPs I would have trained with in my training course... we would still talk to each other about different cases... what do you do if this happens, or where do you refer, or what did you do in this case... If we are doing something wrong, it might influence the other just as doing something right. That is the worry with it.” (GP2_Group A)

Some participants also recounted that “the first thing we would have to do is refer (patients)” because they do not feel confident in managing cases in general practice without specific local guidelines.

“I really wouldn’t feel confident that we could manage it in general practice. It’s one of the few things. I mean I’m happy with the chlamydia, with pretty much everything else, we manage all of the others ourselves but gonorrhoea is the one thing I am always nervous of.” (GP4_Group A)

An example of the importance of local guidelines was provided by one participant. They explained, using an example of urinary tract infections, how local guidelines can make a positive impact on the use of appropriate medication for specific infections:

“Well it’s definitely better if it’s local because for example UTI, there was a guideline on UTI three or four years ago and that made a difference because we had been using medication that UTIs weren’t necessarily sensitive to... so once the guideline came out it was adopted not only by my practice but across general practice.” (GP7_Group C)

At the same time, the issue of multi-drug resistance was broached by one GP who suggested that up to date guidelines on the treatment of gonorrhoea are essential:

“My understanding is that the resistance thing is changing all the time so I’m sure that we aren’t even up to date with the very, very latest and I know that we are starting to run out of antibiotics.” (GP1_Group A)

Useful supports for GPs in practice

All participants identified a need for additional supports to assist them in the diagnosis and management of gonorrhoea in general practice. Participants indicated that the following would be particularly useful in practice: quick guides, flow charts and/or gonorrhoea ‘management algorithms’ to help them check when and where to refer cases if necessary, information on drug-resistance guidelines, and treatment information. One participant reported that information in easy to read graphics would be most suitable for quick reference.

“It’s graphics I prefer to a lot of text, so a kind of flow chart... is definitely easier.” (GP7_Group C)

“...a flow chart and a quick guide to when to refer, where to refer. You know we have ours worked out but I mean we had to work it out for ourselves. It would be lovely you know if someone had come to us at the beginning and said this is the pathway.” (GP4_Group A)

“I guess it would be useful to have a quick reference... a flow chart or something simple for GPs who are not as aware of the (BASHH) guidelines as other GPs particularly with drug-resistance... are they happy for us to go ahead and treat with IM ceftriaxone and then refer or if they need or if we feel confident to manage them... do they need to go to the STI clinic at all or could we manage it?” (GP5_Group B)

Another participant highlighted the need for clarity when dealing with local laboratory services and recommended *“a talk for the local labs”*. They explained how in their practice area each lab they have to engage with *“is different and each testing kit is a different colour or package.”* (GP1_Group A).

Participants also addressed the need for HSE support in terms of financial contracts which would enable GPs to run their own STI clinics.

“I suppose support from the HSE in terms of contracts enabling GPs to run STI clinics would be good but you know that’s obviously financial support that’s needed to be put in place.” (GP2_Group A)

Future of testing

Participants discussed their views on the optimal management of testing for gonorrhoea in Ireland. Five participants considered the primary care setting to be the most appropriate for testing, whilst one participant regarded hospitals/STI clinics as the best setting and one considered both settings to be of equal value. These views were rationalised based on a number of key points. Participants who regarded the primary care setting as most appropriate considered that it was *“more approachable than a STI clinic in terms of a patient’s willingness to come see (their GP)”* (GP4_Group A). They also considered general practice to be easily accessible in terms of quick appointment setting with one participant stating that *“from a screening point of view somebody could get in to see their GP very quickly compared to having to get to an STI clinic”* (GP2_Group A). It was also expressed that patients may have established a strong relationship with their GP and may prefer to undergo tests with a trusted practitioner.

Some participants considered that for testing to be routinely undertaken in the primary care setting, adequate training should be provided. One participant explained how they would not feel confident that appropriate testing was undertaken without updated and relevant training to guide GPs:

“From an education and training point of view, I think if you’re offering comprehensive STI screening including gonorrhoea... you would need to have gone through an updated training course... I wouldn’t really feel confident that we are doing everything correctly without having that guidance...” (GP2_Group A)

They go on to identify that the best approach for the future of screening for gonorrhoea is to ensure that all GPs are following a *“gold standard”* process:

“We (GPs) do have an idea of what we are doing but I suppose it’s just to be doing things in the correct way. It’s just to make sure that everyone is following the gold standard and that everyone is doing the same tests as well because if you are offering a specific service you need to be operating to specific standards.” (GP2_Group A)

One participant with many years of experience in both testing and treating expressed their concern that GPs who do not have suitable access to testing might lose interest in this area over time:

“I see a lot of the young GPs know the information but what’s happening is that they don’t have access to testing in their practices so and then I think they lose it if they don’t have access to the testing then they lose interest in it over time.” (GP7_Group C)

Another participant suggested that testing should take place “*in a hospital setting*” until GPs have a suitable and consistent testing process to follow:

“My real concern is that there is no infrastructure around it so it’s difficult to get consistency.” (GP6_Group B)

Alternatively, another participant suggested that “*patients should have options*” when diagnosed with a positive result. Whilst patients may find it less stigmatising to attend their GP rather than a dedicated STI clinic, they may want to have access to secondary care and STI clinics for treatment and additional services such as partner notification and counselling. They also acknowledged the importance for patients, particularly those in rural settings, to have access to testing in local clinics other than their GP practice.

Future of treatment

There was an understanding among participants that the optimal management of treatment of gonorrhoea should primarily take place in a local primary care setting. Participants explained that they would prefer to treat positive cases of gonorrhoea in their practice if resources were made available to ensure that the treatment process could be followed diligently. It was suggested that this could be achieved with an appropriate audit process to ensure that patients have followed up on all treatment procedures. However, some participants explained that the time pressures they worked within meant that they may not have the appropriate time to follow-up with patients, compared to dedicated STI clinics.

“I think that it might actually be embarrassing to say that we don’t do the IM treatment here because realistically we could... if we had the correct set up so you don’t lose anybody in the mix, and contact tracing and follow up are done properly as well. I suppose that would be my concern because we are just so, so busy in primary care and we are being pulled in multiple directions... I suppose if it’s the case that you are in an STI clinic – that’s the only thing you are looking after... then it becomes an expertise and you have the systems in place to follow people up which is probably safest at the moment.” (GP2_Group A)

It was acknowledged that some cases may be difficult to treat and in such instances cases could be referred forward to specialist services. As one participant explained:

“You could refer to any cases with drug resistance or if the test to cure is positive then the complicated cases could be referred on to the hospital.” (GP5_Group B)

In addition, it was suggested that in cases where patients were “*prolific and chaotic*” then specialist services would be of great benefit to GPs:

“I think that it would be good to have that collaboration and that access to a specialist clinic... if a specific individual is prolific and chaotic or whatever then great, the GP will say look we need your help so that you can streamline the process.” (GP3_Group A).

Discussion

All participants correctly identified high risk groups for contracting gonorrhoea, specifically patients aged under 25 years, patients who travel overseas and men who have sex with men. Participants did not routinely engage in active partner notification in their practice. This was linked to STI clinics being better resourced with specialist staff members to engage in contacting partners, time constraints in general practice and patient discomfort with sharing partner details with their GP. However, all participants advised patients to inform their partners to visit their own GP or attend a STI clinic, referred patients to STI clinics for partner notification, or utilised a mixed approach to the above dependent on their relationship with their patient. These findings are similar to those of the 'Surveillance of STIs' survey (HPSC, 2005) which found that 87.3% of GPs 'always' advised patients to inform their contacts to see their own GP or attend an STI clinic and 94.6% would 'always' or 'sometimes' refer patients to STI clinics for partner notification.

Participants in this study identified some barriers to adequate testing for and management of gonorrhoea within general practice. In Ireland, a population specific, consistent, up-to-date national guidance document is necessary which outlines a clear approach for GPs, clinics and laboratory services. GPs addressed the need for such guidelines to clarify the most appropriate swab taking and testing, including when and how to take specimens. Additionally, these guidelines should define clear, accessible pathways to access local laboratory services and STI clinics, particularly for GPs who are not based in urban hubs. These guidelines should also outline a standardised approach for all national laboratory services, including uniform testing kits for all laboratories and streamlined communication between GPs and laboratory services.

Decision-making tools are central for general practitioners (Ingemansson, Bastholm-Rahmner and Kiessling, 2014). Easy to access, concise and clear reference guides and supports were welcomed by GPs to assist them in the diagnosis and management of gonorrhoea. Quick guides, flow charts and/or gonorrhoea 'management algorithms' were identified as the most useful aids. Critically, these supports must be localised and up to date to ensure that GPs test and treat appropriately and utilise the most relevant referral options if necessary.

All participants indicated that they had completed some form of additional training within the last eight years. Two participants had not completed any training bar personal reading of the BASHH guidelines. However, this is acceptable as GPs can undertake their own Continuous Professional Development via personal reading, e-learning and online searches (ICGP.ie, 2016). The Medical Council Guide to Professional Conduct and Ethics for Registered Medical Practitioners states that practitioners should be up-to-date with developments in their area of practice by participating regularly in Continuing Professional Development (CPD) and in other formal and informal education, training and development (MCI, 2016). It would be favourable for any GPs who test and in particular treat STIs to complete some form of STI training or update within the past five years.

As was evident in the findings, some participants required further education on the most appropriate swabs to use and send to laboratory services for the diagnosis of gonorrhoea. It is likely that some practice nurses are responsible for ordering and stocking swabs and GPs utilise the swabs that they are provided with. As such, it would also be appropriate that practice nurses also receive further training in this topic area.

One participant out of the seven interviewed was unaware of AMR gonorrhoea, however this participant always referred patients on for treatment resulting in no adverse clinical outcome. Most participants interviewed did not have any experience with the clinical presentation of AMR gonorrhoea. In 2013 in Ireland the first cases of in-vitro cefotaxime resistance were reported (Moloney et al., 2013). Of the three cases initially, one case had reduced susceptibility to ceftriaxone and all three cases were resistant to azithromycin and ciprofloxacin. Additionally, in 2015 two cases of gonorrhoea with a *N. gonorrhoeae* strain with high-level azithromycin resistance were reported in Ireland (Lynagh et al., 2015). It is essential that GPs receive further education on the problem of gonorrhoea resistance. Although the Department of Public Health sent a letter to GPs in Dublin, Wicklow and Kildare in 2012 on the management of ceftriaxone resistant gonorrhoea, an additional letter may be necessary to highlight the issue. An appropriate system to communicate updates on drug resistance to GPs should also be easily accessible for all GPs. In addition, a streamlined system for GPs to link with local hospital consultants when queries arise would ensure that all complex cases were treated swiftly and in the most appropriate manner.

Despite it being perceived to be a sensitive topic, all participants were proactive about taking sexual histories. However, lack of experience in discussing the topic with patients was identified as a barrier to recording sexual history. To improve sexual history note taking, GPs may require further education about how to initiate sexual history questions with both old and new patients, understanding how to deal with their own discomfort, and in the use of appropriate and non-judgmental language.

Issues around patient confidentiality and applications for insurance policies was discussed by one GP. It would be necessary in any future training to clarify the situation regarding insurance and related queries.

E-Learning courses on sexual health were found to be useful by one participant. E-learning is a useful tool in clinical practice due to its versatility, universal access and low cost. Ease of access to such modules can positively impact on best-practice for time-poor GPs who are unable to attend courses in person (Ruiz, Mintzer and Leipzig, 2006; Cook et al., 2008; Du et al., 2013). E-Learning on STIs can also help to increase GP confidence in approaching the subject with patients and guide appropriate testing and treatment options. The ICGP provide an e-learning module for GPs on the management of sexually transmitted infections in primary care. This course focuses on relevant clinical issues such as taking sexual histories, signs and symptoms, and the treatment and management of STIs in general practice. This module should be further promoted by the ICGP to ensure that GPs are aware of its ease of access and relevance.

Some participants spoke of the challenges they faced when referring patients to their local hospital for treatment. Issues with lost notes, busy clinics and varied clinic closing times were highlighted. Alternatively, others identified a keen interest in testing, treating and managing their patients personally, however they were requested by their local hospital to refer all patients forward instead. Evidentially GP practices face complex local challenges in the testing and management of gonorrhoea. These localised and varied challenges could be harnessed by the development of uniform national guidelines.

Participants addressed the need for payment for GP services as the current GMS contract does not cover taking and sending samples for STI testing. This effectively

means that GPs who do provide this service must either charge their patient an additional fee or do this work pro-bono. This may be a major disincentive for GPs to undertake testing and treatment in their practices. Improved financial contracts would enable interested GPs to run their own STI clinics. Sufficient funding should be made available to permit appropriately trained and up-to-date practices to test and manage STIs in dedicated clinic sessions.

Recommendations and conclusion

The ICGP and relevant parties are considering these findings and what actions need to be taken from this report. The following recommendations are proposed:

Health promotion messages:

Health promotion messages should be developed for high risk groups highlighting the increase in gonorrhoea in Ireland, and the need to adopt safe sex practices. Critically these messages must address the necessity of routine STI screening following unprotected sex even if no symptoms are present. Ongoing funding and investment in these initiatives are required from the Department of Health.

Guidance and training:

The findings of this study suggest testing in primary care is the most appropriate and easily accessible site for patients for the testing and treatment of gonorrhoea, provided that GPs receive suitable support. As outlined above in the discussion, support in Irish general practice in the form of guidelines on testing, including suitable swabs and appropriate testing sites for all patients including MSM patients, diagnosis and the suitable treatment of gonorrhoea cases are necessary. In particular guidelines should address the importance of taking a culture following a NAATs positive test and the problem of AMR gonorrhoea. Concise visual guides and flow charts are necessary in practice for quick and easy reference. Furthermore, it would be appropriate for a reference laboratory service for *N. gonorrhoeae* to be established for Irish GPs and other health care professionals.

Location specific supports including laboratory services:

GPs involved in the testing and treatment of gonorrhoea should have direct access to and clear lines of communication with local STI laboratory services. Laboratories should be adequately resourced to perform the recommended tests including NAATs, culture and antimicrobial susceptibility testing.

Resources:

STI testing should be included in the GMS contract and this would ensure there is no financial barrier to GPs doing STI testing.

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References

1. Barlow, D. and Phillips, I. (1978) Gonorrhoea in women: diagnostic, clinical and laboratory aspects. *Lancet*, 761-764.
2. Bignell, C. and Fitzgerald, M. (2011) UK national guideline for the management of gonorrhoea in adults, 2011. *Int J STD AIDS*, 22:541-7.
3. Bignell, C and Unemo, M. (2012) European guideline on the diagnosis and treatment of gonorrhoea in adults. *Int J STD AIDS*, 24:85–92.
4. Carr, E.C. and Worth, A. (2001) The use of the telephone interview for research. *NT Research*, 6:511–524.
5. Chapple, A. (1999). The use of telephone interviewing for qualitative research. *Nurse Researcher*, 6(3):85-93.
6. Chisholm, S.A., Dave, J. and Ison, C.A. (2010) High-level azithromycin resistance occurs in *Neisseria gonorrhoeae* as a result of a single point mutation in the 23S rRNA genes. *Antimicrob Agents*, 54:3812–6.
7. Cook, D.A., Levinson, A.J., Garside, S., Dupras, D.M., Erwin, P.J., and Montori, V.M. (2008) Internet-based learning in the health professions: a meta-analysis. *J. Am. Med. Assoc*, 300:1181–1196.
8. Cooney, F. (2016) Report of the Gonorrhoea Control Group for HSE-East and HSE-South East. Dublin: Health Service Executive.
9. Du, S., Liu, Z., Liu, S., Yin, H., Xu, G., Zhang, H., and Wang, A. (2013) Web-based distance learning for nurse education: a systematic review. *Int. Nurs. Rev*, 60:167–177.
10. European Centre for Disease Prevention and Control. (2012) Response plan to control and manage the threat of multidrug-resistant gonorrhoea in Europe. Stockholm: ECDC; 2012.
11. Field, N., Kennedy, I., Folkard, K., et al. (2014) Screening for gonorrhoea using samples collected through the English National Chlamydia Screening Programme and risk of false positives: a national survey of Local Authorities. *BMJ Open*, 4:e006067.
12. Fitzgerald, M.A., Igoe, D., Cooney, F., on behalf of the Gonorrhoea Control Group. (2013) Control group use surveillance findings to target response to gonorrhoea increase. *Epi Insight Oct 2013*, Available at: <http://ndsc.newsweaver.ie/epiinsight/jd8z1rb7uui?a=1&p=41164045&t=17517774>
13. Guidelines for Antimicrobial Prescribing In Primary Care in Ireland. (2013) Expert Working Review Group including ICGP; HPSC; Pharmacy; Microbiology; Infectious Disease; Dentistry; IMB and Public Health. Viewed 19th May 2016. <http://www.antibioticprescribing.ie/genital/gonorrhoea>
14. HPSC. (2005) Surveillance of STIs A report by the Sexually Transmitted Infections subcommittee for the Scientific Advisory Committee of the Health Protection Surveillance Centre. Viewed 19th May 2016. <http://www.hpsc.ie/A-Z/HIVSTIs/SexuallyTransmittedInfections/Publications/File,1437,en.pdf>
15. HPSC. (2015) Gonorrhoea in Ireland, 2014. Viewed 19th May 2016. <https://www.hpsc.ie/A-Z/HIVSTIs/SexuallyTransmittedInfections/Publications/STIReports/LatestSTIReports/File,15669,en.pdf>

16. HPSC. (2016) Statutory Notifications of HIV and STIs reported in Ireland via the Computerised Infectious Disease Reporting (CIDR) system for Week 34, 2016. Viewed 7th September 2016. <https://www.hpsc.ie/A-Z/HIVSTIs/SexuallyTransmittedInfections/Publications/STIReports/STIWeeklyReports/File,15794,en.pdf>.
17. ICGP. (2016) Professional Competence. Viewed 19th May 2016. <http://www.icgp.ie/go/pcs>
18. Ingemansson, M., Bastholm-Rahmner, P. and Kiessling, A. (2014) Practice guidelines in the context of primary care, learning and usability in the physicians' decision-making process – a qualitative study. *BMC Family Practice*, 15:141.
19. Ison, C.A., Deal, C. and Unemo, M. (2013) Current and future treatment options for gonorrhoea. *Sex Transm Infect*, 89(4):52–56.
20. Lynagh, Y., Mac Aogáin, M., Walsh, A., Rogers, T.R., et al. (2015) Detailed characterization of the first high-level azithromycin-resistant *Neisseria gonorrhoeae* cases in Ireland. *J. Antimicrob Chemother*, first published online April 22, 2015.
21. MCI. (2016) Guide to Professional Conduct and Ethics for Registered Medical Practitioners, 8th Edition. Dublin: Medical Council of Ireland.
22. Moloney, G., Coleman, C., Carroll, C., Cremin, P., Ui Riain, U., Cormican, M. and Fleming, C. (2013) First report of ceftotaxime and azithromycin resistant *N. gonorrhoeae* in Ireland; multidrug resistant isolates from three linked patients. Presented at European Society of Clinical Microbiology and Infectious Diseases April, 2013.
23. Palmer, H.M., Mallinson, H., Wood, R.L., et al. (2003) Evaluation of the specificities of five DNA amplification methods for the detection of *Neisseria gonorrhoeae*. *J Clin Microbiol*, 41:835–7.
24. Ruiz, J.G., Mintzer, M.J. and Leipzig, R.M. (2006) The Impact of E-Learning in Medical Education. *Academic Medicine*, 81(3):201-212.
25. Sherrard, J. and Barlow, D. (1996) Gonorrhoea in men: clinical and diagnostic aspects. *Genitourin Med*, 72:422-426.
26. Unemo, M. and Nicholas, R.A. (2012) Emergence of multidrug-resistant, extensively drug-resistant and untreatable gonorrhoea. *Future Microbiol*, 7(12):1401-22.
27. WHO. (2012) Global action plan to control the spread and impact of antimicrobial resistance in *Neisseria gonorrhoeae*. Geneva: World Health Organisation.



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