

# SCREENING FOR SEXUALLY TRANSMITTED INFECTIONS AT COLLEGE CAMPUS HEALTH CENTERS: RECOMMENDATIONS TO INCREASE SCREENING RATES

by

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**Abstract**

Sexually transmitted infections (STI) are a significant public health issue among college students. Routine screening for STIs among adolescents and young adults is considered critical for preventing long term negative health effects and reducing transmission. Despite the importance of screening, many college students are not being tested at recommended rates. This paper identifies promising and effective interventions to increase STI screening among college students, focusing on structural interventions at college campus health centers to promote testing. Several promising policies, including express visits for STI testing, opt-out testing, and alternative testing strategies are reviewed. The paper concludes with recommendations about increasing screening at UNC-Chapel Hill Campus Health Services. Recommendations include: offering express visits for STI testing for asymptomatic students, considering opt-out testing, and implementing population level promotion campaigns.

**Introduction**

College students in the U.S. are at risk for contracting sexually transmitted infections (STI). Adolescents ages 15 to 24, who make up the majority of the college student population, account for half of all new STIs diagnosed in the US each year.<sup>1,2</sup> Numerous public health agencies recommend routine screening for STIs among this age group in order to prevent long-term ill health effects. Given the asymptomatic nature of many STIs, screening is considered a key part of health care for this age group.<sup>3,4</sup> However, many college students are not being screened at recommended rates and as a group face many barriers to seeking testing. There is a recognized need for interventions to encourage more students to be screened.<sup>5-7</sup> College health centers must play a leading role in engaging more students in screening for STIs. This paper will explore STI testing among college students, with a specific focus on the University of North

Carolina at Chapel Hill (UNC-CH). The purpose of this paper is to identify promising and effective interventions to increase STI screening among college students and to recommend policy changes or strategies to promote screening at UNC-CH. First, the problem of STIs, barriers to screening, and the need for increased screening is described, primarily by looking at the national picture of STIs among this group, then by examining UNC-CH more closely. Second, promising practices for increasing STI screening rates are described, including both health promotion interventions and structural policies at the clinic level that address some of the barriers to screening. Third, these policy changes are analyzed through several policy evaluative criteria to identify the policies best suited for increasing testing. Finally, policy changes and interventions specific to UNC-CH are suggested based on the policy evaluative criteria.

There are several infections and diseases that can be transmitted sexually. This paper concentrates on four specific STIs: chlamydia, gonorrhea, syphilis, and HIV/AIDS. These infections are selected due to the quality of data surrounding their prevalence, the availability of reliable screening technology, and recommendations about routine testing for these infections.

### **Background Information**

It is difficult to get an exact accounting of the burden of STIs among college students. College students in the United States are a diverse group numbering more than 17 million and enrolled in more than 4,000 degree-granting, higher education institutions.<sup>8</sup> Most disease surveillance efforts do not collect information about student status.<sup>8</sup> Therefore, age group is often used to describe risk for the population of college students. While the average age of undergraduate students has risen in recent years, 62% of undergraduate students in the United States are under the age of 25.<sup>9</sup> The portion of students under 25 years old is higher for four-year

institutions with mostly residential, full-time student bodies.<sup>9</sup> The average age of students for the 2011-12 school year at UNC-Chapel Hill was 20.<sup>10</sup>

Adolescents and young adults ages 15 to 24 are disproportionately affected by STIs. People ages 15 to 24 account for about 25% of the sexually active population, yet, half of the 19 million new STI infections in the US each year are in people in this age group.<sup>1,2</sup> Adolescents ages 15 to 19 years old have the highest rates of STIs of any age group.<sup>11</sup> It is estimated that half of all sexually active youth will get an STI by age 25.<sup>11</sup>

Chlamydia is the most common bacterial STI in the United States and the rates of chlamydia increased by 2.8% from 2009 to 2010 among 15-19 year olds and by 7.5% among 20-24-year-olds during the same time period.<sup>1</sup> In 2010, the rate of chlamydia among 15-19-year-olds was 2,049 per 100,000; among 20-24-year-olds, it was 2,270 per 100,000.<sup>1</sup> Females in these age groups had much higher rates than males (3,378 per 100,000 for females ages 15-19 vs. 774 per 100,000 for males). While not as prevalent as chlamydia, gonorrhea rates also increased among adolescents and young adults from 2009 to 2010.<sup>1</sup> Among 15- to-19-year-olds, the rate of gonorrhea was 409 among 100,000 people and among 20-to-24-year-olds, the rate was 490 per 100,000.<sup>1</sup> Re-infection with chlamydia and gonorrhea is common; it is estimated that 13.9% of women diagnosed with chlamydia and 11.7% diagnosed with gonorrhea have another positive test within eight to ten months after initial diagnosis.<sup>12</sup> However, it is possible that some cases of reinfection are actually cases in which original treatment failed and the original infection has persisted. In one longitudinal cohort study from 1999 to 2005, 13.7% of repeat chlamydia infections among young women were attributed to treatment failure.<sup>13</sup> Treatment failure is of particular concern with gonorrhea, as the bacteria has become resistant to many treatments and currently only one class of antibiotics is recommended for treatment.<sup>14</sup>

Adolescents and young adults are also infected with HIV and syphilis at high rates. In 2010, young people ages 15-29 accounted for 21% of the population, yet made up 39% of all new HIV infections.<sup>15</sup> In 2009, the highest rates of new HIV infection were in people ages 20-24.<sup>15</sup> Young men who have sex with men (MSM) are particularly at risk, especially men of color. Among MSM age 13 to 24, more than half of new infections occur in African American men.<sup>16</sup> While the rates of syphilis in the US decreased dramatically from 1990 to 2000, the rate increased each year from 2000 to 2009. Syphilis is often concentrated among specific population subgroups, especially MSM, and it is often seen in people who are co-infected with HIV.<sup>17</sup> The highest rates of syphilis are in people ages 20 to 24 years old.<sup>17</sup>

Among adolescents and young adults, there are disparities between the groups that are most affected by STIs. Different STIs affect men and women at different rates. Women are disproportionately affected by chlamydia. In 2011, women had 2.5 times the rate of chlamydia than men. The same year, there was no significant difference between rates of gonorrhea in men and women. Men had 8.2 times the rate of syphilis compared with women, and men account for 75% of those living with HIV/AIDS in the US.<sup>18</sup>

The effects of sexually transmitted infections often vary along gender lines as well. Biologically, women are more susceptible to genital infection; it is easier for bacteria, viruses, and other infectious agents to cross the lining of the vagina than it is the penis.<sup>19</sup> Women are also less likely than men to have symptoms of some STIs, such as gonorrhea or chlamydia, and they are more likely to mistake symptoms that do occur, such as burning or discharge, as signs of another medical condition.<sup>19</sup> When infected, women can often have more serious health consequences than men. For example, chlamydia infection in women can cause serious disease, such as pelvic inflammatory disease, and infertility, with relatively few long-term consequences

for men.<sup>19</sup> Due to the high burden and risk of long-term consequences for women, separate recommendations about screening are often made for men and women.

STIs disproportionately impact people of color. African-American populations are particularly at risk.<sup>20</sup> In 2010, African-American women experienced a chlamydia rate more than seven times higher than the rate among white women (1,536.5 and 205.1 per 100,000 women, respectively). Similarly, the chlamydia rate among black men was almost 11 times the rate among white men (761.8 and 69.9 cases per 100,000 men).<sup>20</sup> American Indian and Hispanic populations also experience higher rates of STI infection, compared to Whites.<sup>20</sup>

Research on STIs among college students has identified a wide range of prevalence rates.<sup>21</sup> One study examining rates of chlamydia infection among California college students from 2000 to 2002 found a rate of about 3.4%, while a study of West Virginia college students found rates varying from 3.5 to 8.8% between 1989 and 1994.<sup>21</sup> A 2004 study of large universities in three southeastern states found a chlamydia positivity rate of about 9.7%.<sup>21</sup> This is higher than a prevalence rate of 2.2% among the general US population of all ages.<sup>21</sup> Certain groups of students in the study had higher positivity rates. For example, students that were younger had a higher positivity rate than older students (OR 1.66; 95% CI 1.01–2.73).<sup>21</sup> Female students also had a higher chlamydia positivity rate than male students (8.8% vs. 5.9%). In addition, African-American student participants had a higher chlamydia prevalence than White students (11% vs. 1%).<sup>21</sup>

In addition to data about chlamydia infection, a 2005 article described increasing rates of HIV infection among college students in North Carolina and identified college students as a new risk group for HIV infection, previously ignored in much HIV prevention work.<sup>22</sup> By examining disease surveillance data from 69 of 100 North Carolina counties, the authors found that 11% of

reported new HIV infections among men ages 18-30 years old from 2000 to 2003 were among college men.<sup>22</sup>

The American College Health Association Pap Test and STI Survey<sup>23</sup> of college campus health centers, conducted annually, identifies positivity rates for chlamydia, gonorrhea, HIV, and syphilis among students testing at college health centers. The 2011 rates are described in detail in Table 1.

<b>Table 1: Positivity Rates Reported in 2011 ACHA Survey of College Campus Health Centers</b> <sup>23</sup>			
<b>STI</b>	<b>Total Positivity Rate</b>	<b>Male</b>	<b>Female</b>
Chlamydia	4.9%	8.4%	4.0%
Gonorrhea	0.6%	1.7%	0.31%
Syphilis	0.3%	Data Unavailable	Data Unavailable
HIV/AIDS	0.11%	0.20%	0.03%

Source: American College Health Association 2011 Pap and STI Survey.<sup>23</sup>

The highest positivity rates were for chlamydia infection. For all STIs, men had a higher positivity rate than women.<sup>23</sup> This may be because men are more likely to be tested due to symptoms.<sup>23</sup> It is important to note that this survey only examines the positivity rate among those students who choose to test. Therefore, the rates are likely to be lower than the actual prevalence among the student population. Many of the statistics known about STI prevalence include only rates of positivity among those who choose to test, which can be problematic when looking at disease rate in the overall population.

#### *Risk Factors for College Students*

A number of factors, including behavioral, biological, interpersonal, and structural characteristics, put young people at increased risk for sexually transmitted infections.<sup>11</sup> Risky behaviors that can lead to STIs are more common among young people. On average, males and

females initiate sex at age 17.<sup>24</sup> The 2012 National College Health Assessment (NCHA) provides some information about sexual behavior of college students across the country. The NCHA is administered by individual universities each year and results are compiled by the American College Health Association (ACHA). The Reference Group report presents data from 28,237 respondents and 51 schools, all schools that surveyed the entire student body or used a random sampling technique.<sup>5</sup> The average age of respondents was 21.96 and includes respondents from each grade level. According to the 2012 NCHA Reference Group report, 69.2% of respondents report having ever engaged in oral sex; 65.8% report history of vaginal sex; and 22% report history of anal sex.<sup>5</sup> College students report high rates of sexual intercourse without condom use, multiple sexual partners, and engaging in sexual activity under the influence of drugs or alcohol.<sup>24</sup> In the 2012 NCHA, 53.5% of sexually active respondents reported mostly or always using a barrier method during vaginal sex in the past 30 days and 29.7% reported mostly or always using a barrier method during anal sex in the past 30 days.<sup>5</sup> In the same survey, 28.1% of men and 23.1% of women reported 2 or more sexual partners in the previous 12 months and 18.6% of students reported having unprotected sex after drinking alcohol in the previous 12 months.<sup>5</sup> There is little research about same-sex behaviors of college students. In one research study, using a large, nationally representative sample of college students, 5% of students reported a history of a same-sex partner.<sup>25</sup>

In addition to behavioral risk factors, young people may also be at increased for STIs due to biological factors. For example, females under the age of 26 have a higher susceptibility to chlamydia due to increased cervical ectopy.<sup>26</sup> Additionally, being infected with one STI, such as herpes simplex virus, which is very common among adolescents and young adults in the US, can put someone at increased risk of contracting another STI.<sup>27</sup> There are also structural barriers for



adolescents in receiving health care that may limit adolescents' ability to access sexual health services.<sup>26</sup> The Centers for Disease Control and Prevention (CDC) notes that adolescents and young adults may have difficulties with health insurance, ability to pay, transportation, concerns about confidentiality, and discomfort with medical services.<sup>26</sup> Therefore, strategies to decrease the incidence of STIs among these age groups should focus on both individual behaviors and structural factors that may limit the rate at which youth seek out health services.<sup>26</sup>

### *Health Effects of STIs*

STIs can lead to both immediate and long-term negative physical and mental health issues. While all STIs can be treated, not all can be cured. Bacterial STIs, including chlamydia, gonorrhea, and syphilis, are treated by antibiotics, and while the infections can be eliminated from the body, any lasting effects may be more difficult to treat.<sup>28-30</sup> HIV cannot be cured, but very effective treatments exist that can prolong the life of people living with HIV/AIDS.<sup>31</sup> When untreated, STIs can cause long term reproductive health problems, especially among women. It is estimated that at least 24,000 women in the US become infertile each year due to undiagnosed and untreated STIs.<sup>4</sup> Untreated vaginal STI infections, such as chlamydia and gonorrhea, can lead to pelvic inflammatory disease (PID) if an untreated infection spreads to the uterus or fallopian tubes. Some of the health issues associated with PID include severe pelvic pain, infertility, and ectopic pregnancy.<sup>28</sup> According to the National Chlamydia Coalition, it is estimated that as many as 40% of untreated cases of chlamydia will spread and develop into PID.<sup>32</sup> Of untreated cases of PID, 20% will lead to infertility, 18% to chronic pelvic pain, and 9% to ectopic pregnancy.<sup>32</sup> In addition, if a woman with untreated chlamydia or gonorrhea is pregnant, the bacteria can contribute to pre-term delivery and can cause eye infections or pneumonia in the child.<sup>28</sup> While men typically do not experience severe long-term consequences

from chlamydia infection, it is possible for infection to spread through the male reproductive tract and cause pain and fertility impairment.<sup>28</sup> Gonorrhea has many of the same long term consequences as chlamydia for both infected men and women and for children born to mothers with untreated chlamydia. Additionally, untreated gonorrhea can also spread to the blood or joints, conditions which can be fatal.<sup>29</sup>

The late stages of syphilis can cause fatal damage to the brain, nerves, heart, liver, and joints. It can also cause paralysis, gradual blindness, and dementia.<sup>30</sup> Syphilis can be transmitted from a pregnant woman to her baby, causing low birth weight, premature delivery, and still birth.<sup>30</sup> Chlamydia, gonorrhea, and syphilis infection can also increase an individual's risk of HIV infection.<sup>4</sup> HIV targets cells in the immune system, making it less able to defend against certain opportunistic infections that can be fatal.<sup>31</sup> Early detection and treatment of HIV can improve individual health outcomes and decrease transmission. Early use of antiretrovirals can help protect the immune system and decrease opportunistic infections.<sup>33</sup>

Even when discovered and treated early, STIs have a high cost for the health care system. It is estimated that STI treatment costs the health care system as much as \$15.9 billion each year. This includes the direct medical costs for treating STIs and related health issues, but does not include costs of pain and suffering or loss of productivity.<sup>4</sup>

### *Prevention*

Prevention strategies at various levels are essential to decreasing the incidence of STIs among college students. Primary prevention strategies include educating about STI transmission, counseling about safer sex practices, and encouraging condom use.<sup>34</sup> Primary prevention also includes immunizations, such as the vaccination to protect against certain strains of human papilloma virus (HPV). Secondary prevention focuses on strategies that diagnose and treat STIs,

including screening, early detection and treatment of STIs, and partner tracing and treatment.

Tertiary strategies include treating and preventing the long-term health consequences of STIs.<sup>34</sup>

This paper focuses on secondary prevention strategies, specifically, screening strategies and interventions.

### *Screening*

Screening for STIs is considered an important part of routine medical care, particularly for young adults.<sup>32</sup> Screening is important for several reasons. One, many STIs do not result in any symptoms; symptoms that do occur are often unnoticed by an infected individual. Research indicates that 60-90% of men and 70-95% of women with genital chlamydia infection do not report any symptoms.<sup>28,35</sup> There can also be a long period of time between infection and the more serious complications of STIs that will cause infected individuals to seek medical treatment.<sup>4</sup> Therefore, many people who are infected do not know they are infected and may delay seeking medical care. Not only are they at risk for negative health consequences, but these individuals can unknowingly transmit the infection to sexual partners.<sup>4</sup> Identifying and treating STIs early can help prevent some of the negative effects of infection and prevent new infections. In the case of chlamydia, screening can reduce complications, such as PID, by about 60%.<sup>34</sup>

Testing for chlamydia and gonorrhea does not require invasive procedures and can be done in a variety of settings.<sup>36</sup> A urine sample or a genital swab can be examined using very sensitive and specific nucleic acid amplified tests (NAATs) to detect the presence of chlamydia or gonorrhea bacteria. It is not necessary that a pelvic exam be conducted.<sup>37</sup> The development and use of NAATs has been correlated with an increase in chlamydia testing, as patients and many providers prefer the less invasive use of urine rather than genital swab.<sup>1,36</sup> Rapid tests for chlamydia and gonorrhea are under development, but not yet available.<sup>37</sup> Tests that allow for

patient self-collection of a vaginal swab that is then sent through the mail to a lab are also available, although not yet approved by the US Food and Drug Administration (FDA).<sup>37</sup> Several studies have determined that self-collection test kits would be widely accepted by young adult women.<sup>37</sup>

There are several options for HIV testing, including rapid, point-of-care tests, that allow for patients to get results within twenty minutes.<sup>38</sup> Rapid tests, which can be used with either an oral or small blood sample, detect evidence of HIV antibodies, which means there is a period of up to three months before the test will detect infection. In addition to antibody testing, there are laboratory blood tests that detect presence of HIV RNA. These tests have a significantly shorter window period.<sup>38</sup> In late 2012, an FDA approved, home-based, rapid HIV test was released on the market that allows users to test and read results themselves. For all rapid tests, positive results must be followed with a laboratory test to confirm diagnosis. Syphilis is most commonly diagnosed through laboratory blood test.<sup>36</sup>

There are several recommendations from federal agencies, professional organizations, and public health groups about screening for sexually transmitted infections among adolescents and young adults. The Centers for Disease Control and Prevention (CDC), the US Preventive Services Taskforce (USPSTF), American Academy of Family Physicians (AAFP), and the American College of Obstetricians and Gynecologists (ACOG) all recommend that sexually active women ages 25 and younger be tested each year for chlamydia.<sup>3</sup> The USPSTF, AAFP, and ACOG recommend the same screening frequency for gonorrhea.<sup>3</sup> Recommendations about routine screening focus heavily on women. Women are targeted because detecting chlamydia early can result in significant health benefits such as the prevention of PID; therefore, it is very cost effective to screen women.<sup>39</sup> Women are also more likely than men to be engaged in health

services, making it easier to reach them with screening services.<sup>39</sup> For the general population of men, there are no recommendations for routine chlamydia or gonorrhea screening. The CDC suggests that chlamydia screening for men be considered in settings with a high prevalence of chlamydia, including adolescent clinics, correctional facilities, and STI treatment clinics.<sup>40</sup> Some public health practitioners have advocated for expanding chlamydia screening recommendations to include men.<sup>39</sup> Holland<sup>39</sup> calls the exclusion of men a “missed opportunity for obtaining epidemiological data about chlamydia in this population and better evidence about men's participation and role in chlamydia control.”<sup>para 21</sup> There are special screening recommendations for certain populations of men. For all men who have sex with men, the CDC recommends several STI screening tests each year including: HIV serology test, syphilis serology, gonorrhea and chlamydia urethral infection test, gonorrhea and chlamydia rectal test, and gonorrhea pharyngeal infection test. For both men and women with a positive chlamydia screen, the CDC recommends re-testing three months after the initial diagnosis and treatment.<sup>12</sup> The CDC issued new recommendations regarding treatment and re-testing for gonorrhea infection in 2012.<sup>14</sup> The gonorrhea bacteria has become resistant to many previous treatments and currently, only one class of antibiotics is recommended to treat gonorrhea. There are many concerns that this remaining class may become less effective and treatment failures have been reported in other countries. Therefore, the CDC recommends that re-testing using a culture based test be conducted one week after treatment for patients with persistent symptoms or for patients who did not use the frontline dual antibiotics recommended for treatment.<sup>14</sup> This re-test, called a test of cure, protects against treatment failure.<sup>14</sup>

The USPSTF, CDC, ACOG, and AAFP recommend syphilis screening annually for all people at increased risk. Behaviors that may indicate an individual is at increased risk include

having multiple concurrent sexual partners, having a new sexual partner, using condoms inconsistently, and having sex under influence of drugs or alcohol.<sup>3</sup> Both the USPSTF and CDC recommend HIV screening at least once for all people ages 13 to 64 as a part of routine medical care.<sup>3,41</sup> All four organizations also recommend screening all pregnant women for HIV and syphilis.<sup>3</sup> Screening for chlamydia and gonorrhea is also recommended for pregnant women under the age of 25 and for pregnant women at higher risk due to the risk of transmission to an infant if a mother is undiagnosed and untreated for infection.<sup>3</sup>

In addition to recommendations about testing, public health agencies have identified increased screening for certain STIs as health indicators and goals for national health promotion plans. Healthy People 2020 contains several goals surrounding screening, including: to reduce the proportion of adolescents and young adults with chlamydia, to increase the proportion of sexually active women under age 25 who receive a chlamydia screening each year, and to decrease the proportion of women needing treatment for PID.<sup>4</sup> Similarly, Healthy Campus 2020, a framework from the American College Health Association (ACHA) to improve college students' health, includes several objectives surrounding STIs and screening.<sup>42</sup> These include: reducing the proportion of students who test positive for chlamydia as reported by their university health services in the last 12 months, increasing the proportion of university health services that report routinely screening sexually active women under the age of 26 for chlamydia, and increasing the proportion of students who report having ever been tested for HIV.<sup>42</sup> College and university health centers play a large role in achieving these goals. Most college and university health centers offer STI screening services and it is estimated that about 75% of college health centers offer screening for the most common STIs and four-year institutions with on-campus residential housing are more likely to offer STI testing services.<sup>43</sup>

More than 90% offer screening for chlamydia and gonorrhea and 78% offer HIV screening. Only 38% of centers offer syphilis testing.<sup>43</sup>

Despite the risk for STIs, clear recommendations for testing, and the availability of testing at health centers, many college students are not routinely screened for STIs. Even when services are available, many students delay seeking out those services.<sup>6</sup> It is estimated that less than half of sexually active women under 25 are screened for chlamydia each year.<sup>44</sup> In the 2012 NCHA, nearly 70% of students surveyed reported never having been tested for HIV.<sup>5</sup> In one study of sexual behaviors at a large, southeastern university, nearly 70% of students reported engaging in oral, vaginal, or anal sex. Yet only 33% reported ever being tested for STIs.<sup>45</sup> Even when STI symptoms are present, college students may delay seeking testing services. In one study, 75% of college men delayed testing or getting help for STIs two to six months after recognizing symptoms.<sup>46</sup> Delays in screening and treatment are problematic as untreated STIs can lead to worse health outcomes and transmission of infections to sexual partners.<sup>46</sup>

### *Barriers and Challenges to Testing*

Researchers have identified several barriers to STI testing among adolescents at multiple levels of the socio-ecological model. At the individual level, knowledge about STIs and testing, beliefs about seriousness and risk, and attitudes about screening can act as barriers to seeking testing. In many studies, adolescents and young adults report low knowledge of asymptomatic STIs and their long-term health consequences.<sup>7</sup> According to a survey by the Kaiser Family Foundation, 37% of respondents (ages 12 to 17) did not think that STIs could lead to infertility.<sup>7</sup> Some STIs, in particular HIV, are viewed as more serious than others. In a study of testing among college students, 75% of students interviewed said that because awareness and education about HIV/AIDS are more prevalent than education about other STIs, it was more common to

seek out testing for HIV rather than other STIs.<sup>6</sup> Even among adolescents with knowledge of STIs, many college students and other adolescents may not believe STIs to be serious and may not think that they are at risk.<sup>7</sup> Researchers talking to college students during in-depth qualitative interviews reported that students often dismissed STIs as not being very serious.<sup>6</sup> In addition, in data from the National Longitudinal Study of Adolescent Health, only 14% of a representative sample of 18- to- 24-year-olds with a history of sexual activity thought they were at risk for getting chlamydia or gonorrhea.<sup>7</sup> In their 2002 qualitative interviews with college students, Barth et al. found that many students said not having symptoms would deter them from being testing, even if they were at risk.<sup>6</sup>

Even among adolescents who do perceive themselves to be at risk, there can be embarrassment associated with testing and fear of a positive result.<sup>7</sup> Research has identified two sources of embarrassment associated with testing: adolescents being embarrassed to talk to health care providers about testing and embarrassment related to friends and family's perceptions about testing.<sup>7</sup> In Barth et al.'s<sup>6</sup> qualitative study of college students' perceptions of STI testing, 61% of students interviewed mentioned embarrassment in association with STI testing. One student in the study said, "It might change your life some. A rumor might get spread about her; people can be pretty cruel sometimes. They might look at her different, like she was loose, doesn't really care about herself. Maybe that she's cheap."<sup>6, p.155</sup> Societal stigma was also cited as a barrier to testing.<sup>6</sup> One student in Barth et al.'s study remarked on the stigma surrounding STI testing, saying "I don't know, there's just something, an aura, around getting tested for an STI. You'd rather get tested for mono rather than AIDS. Even though mono is just as contagious or maybe even more so...someone who has herpes is going to be avoided more than the person who has mono."<sup>6, pp. 156-157</sup> Stigma has particularly been identified as a barrier to HIV testing and a



factor in delays in seeking testing among people at high risk for HIV.<sup>47</sup> In one study, more than 60% of MSM surveyed cited stigma as a barrier to testing.<sup>47</sup>

Concerns about confidentiality of testing services have often been identified as a barrier for teens seeking testing services. Fear that peers, parents, or other family members will find out about testing can deter testing or affect where teens go for testing services.<sup>7</sup> Another barrier to testing may be lack of knowledge about testing centers. A 2009 study of college students at a Northern California University by Tolani and Yen<sup>48</sup> found that 21% of participants did not know what STI testing involved and 15% said they did not know where to get tested.

There are several factors associated with the actual testing services that college students have reported as being barriers to testing. For one, the cost of testing can be a barrier for some students. Even with insurance coverage, students may fear costs associated with the test and may also be reluctant to use insurance provided by their parents due to concerns about confidentiality.<sup>49</sup> The degree to which testing is viewed as convenient can also impact students' testing practices. The ease of getting an appointment, appointment schedules that match students' schedules, and ease of getting to the testing site can also influence testing.<sup>6</sup> Long waiting times before appointments are available and long waiting times once patients arrive for clinic appointments can also be deterrents to regular testing.<sup>6</sup> Many interventions could address these barriers and increase testing among college students.

In addition to patient barriers to STI testing, medical providers may also face challenges to incorporating routine testing into their clinical practice. Provider reluctance or failure to address STI testing during medical visits may present a barrier to testing for adolescents who are engaged in medical care. There are several different factors that influence a provider's willingness to screen for STIs, including knowledge, attitudes, and system level issues. Providers

with more knowledge about STIs are more likely to routinely recommend screening. In one study of primary care providers in Pennsylvania, providers who understood the relationship between chlamydia and PID were more likely to screen adolescent female patients for chlamydia.<sup>50</sup> Providers with little confidence in speaking with patients about their sexual history and activity are also less likely to offer chlamydia screening.<sup>7</sup> One systematic review of barriers to providing routine HIV testing found that providers cited their own lack of training and knowledge about HIV as a barrier to screening.<sup>51</sup> Providers' attitudes about STI screening also influence their screening practices. The survey of Pennsylvania primary care providers found that providers had a greater likelihood of screening patients if they believed most of their female patients were sexually active and if they felt it was their duty to provide information about STIs to patients.<sup>50</sup> A provider's beliefs about the need for screening among the patient population are also correlated with screening practices. Studies have shown that providers are less likely to screen women for chlamydia if they thought that prevalence was low.<sup>50</sup> Additionally, in the review of provider barriers to routine HIV testing, the belief that HIV was not an issue for the patient population made providers more reluctant to incorporate routine HIV testing. Fear of offending patients by bring up testing was also a barrier to routine HIV testing.<sup>51</sup> There are also several structural factors that have been identified by providers as barriers to screening, including insufficient time within appointments, cumbersome consent processes, and counseling requirements.<sup>51</sup> Provider barriers to offering STI testing and counseling can influence screening rates among patients.

#### *University of North Carolina at Chapel Hill*

The University of North Carolina at Chapel Hill (UNC-CH) is one of the universities in the University of North Carolina's network of 17 public institutions.<sup>52</sup> At the beginning of the

most recent academic year in fall 2012, UNC-CH had a total enrollment of 29,278, with 63% of those students pursuing undergraduate studies, 28% in graduate, and 9% in professional programs.<sup>53</sup> Of all students in 2012, 65% identified as White, 8% as Black or African American, 7% as Hispanic, and 20% as another race/ethnicity. Of students at all levels, 58% were female and 42% were male. In addition, 93% of undergraduate students were between 18 and 24 years old.<sup>53</sup>

The health needs of UNC-CH students are served by a few clinics in Chapel Hill. UNC-CH Campus Health Services is located on campus and provides comprehensive health care to a large portion of the student body and serves as a medical home for both undergraduate and graduate students. The mission of Campus Health Services (CHS) is “to partner with the University community to provide expert, student-centered, inclusive, and comprehensive health care and wellness promotion to support academic success. We help build skills for a healthy lifetime by fostering resiliency and mastery of self-care in a global environment.”<sup>54,para 1</sup> The services that CHS provides include ambulatory primary medical care, mental health services, obstetrics/gynecology, orthopedics, and dermatology. CHS also has an in-house pharmacy and laboratory. Students enrolled in a degree-seeking program, spouses of enrolled students, postdoctoral fellows and spouses, and former patients not currently enrolled but expected to return in the immediate future are all eligible for services at CHS.<sup>54</sup> CHS services are paid for both through a campus health fee, paid by eligible students, and fee for service. The campus health fee covers most professional services including primary care, women’s health, and counseling visits. Laboratory tests, immunizations, procedures, and treatments are often not covered by the campus health fee.<sup>54</sup> All UNC undergraduate students who are enrolled for at least six credit hours in a degree-seeking program and all graduate students who are enrolled for

at least one credit hour in a degree-seeking program are required to have health insurance prior to enrollment. Students are eligible to participate in a university-sponsored health insurance plan or they may provide certificates of coverage in another plan.<sup>54</sup>

Campus Health currently offers several options for STI testing, including testing for chlamydia, gonorrhea, herpes, hepatitis B, HIV, and syphilis. Prices for tests range from \$9 for a syphilis blood test to \$150 for some herpes testing. These prices are the full price, without any insurance coverage. Students must make an appointment with either the Primary Care medical clinic or the Women's Health clinic to receive an STI test.<sup>54</sup> Negative results are published through the online Healthy Heels portal, which students can access by logging in with a unique identification name and pass code. Positive results are provided by a health care provider; treatment counseling, and additional testing are offered as needed. Rapid oral HIV home test kits are also sold at the Campus Health over-the-counter pharmacy for \$33 and blood test kits are sold for \$55.

UNC-CH offers health education services for students through the Student Wellness Department. Until December 2012, health education and promotion services were provided through the Counseling and Wellness Department of Campus Health. In December 2012, those services were moved to a new department, called Student Wellness, which is under the Dean of Students and Office of Student Affairs. Student Wellness is physically housed in the Campus Health building. Student Wellness employs three to four part-time, para-professional staff members each academic year to serve as Carolina Health Education Counselors of Sexuality (CHECS). The CHECS are graduate students who are trained to offer counseling about contraception and healthy sexuality to UNC students.<sup>54</sup> CHECS also offer HIV and syphilis testing for students. An appointment is required. HIV testing is offered both through a rapid, oral

test and through a blood draw test. The CHECS also provide population-based sexual health programming, including large-scale education campaigns and undergraduate peer education groups focused on safer sex.

Outside of Campus Health, there are additional STI testing options for students at UNC-CH. First, the Orange County Health Department offers free counseling and testing for HIV, syphilis, gonorrhea, chlamydia, and herpes at its clinics in Hillsborough and Chapel Hill.<sup>55</sup> Testing is by appointment only, and services are offered for a sliding-scale fee based on income. In addition to Orange County, the Student Health Action Coalition (SHAC), a student-run health clinic operating one night per week in Carrboro, NC, offers rapid HIV testing without cost.<sup>54</sup> Planned Parenthood of Central North Carolina, with a clinic location approximately five miles from the UNC-CH campus, is another option for STI testing for students, with tests for chlamydia, gonorrhea, syphilis, and HIV costing a total of \$180 to \$215 with a sliding scale fee available and insurance accepted.<sup>54</sup>

There are two assessments that paint a picture of the sexual experiences and STI testing practices of UNC-CH students. These assessments indicate that students at UNC-CH are at risk for STIs. According to the 2011 National College Health Assessment (NCHA), conducted among a group of UNC-CH students, 72.9% of students reported having ever engaged in oral sex, 66% of students reported having ever engaged in vaginal sex, and 21.9% reported history of anal sex. Further, 44.4% of students who engaged in sexual activity in the 30 days prior to the survey reported mostly or always using a condom during vaginal sex; 25.3% reported mostly or always using a condom during anal sex. In addition, 15.2% of students reported engaging in unprotected sex while drinking alcohol in the last 12 months.<sup>56</sup> Based on this survey, it is clear that students are engaging in behaviors that may put them at risk for STI infection. Despite this,

surveys indicate that students are not being tested at high rates. In the 2011 NCHA conducted among a group of UNC-CH students, 30% of students surveyed reported ever having been tested for HIV. A 2013 survey administered to a representative group of UNC-CH students measured history of STI testing by self-report. Of sexually active respondents, 48% had never been tested for any STIs and 4% were unsure if they had ever been tested.<sup>57</sup> While it is encouraging that almost half of sexually active respondents had been tested for some STIs, it still appears that many students are not accessing testing services. This data indicates some of the challenges of STI testing among UNC-CH students, but it does not provide a full picture. Additional data could be gathered about specific barriers to testing, where students are tested, and the time frame of reported testing. However, this data indicates that more UNC-CH students should be engaged in STI testing.

### **Interventions to Increase STI Testing Among College Students**

Interventions to increase STI testing among college students are needed to help address barriers to testing. As a “health care home” for many students, university health centers have a central role to play in encouraging routine testing among an increased number of students.<sup>24</sup> While the majority of university health centers offer testing for common STIs, there are vast differences in how these services are offered, promoted, and utilized. The literature is sparse in identifying evidence-based practices for increased testing. However, there are many ways that health centers can promote increased STI testing, including health promotion campaigns, structural changes within the clinic, and alternative testing options. Several successful approaches are outlined in this section.

One strategy to promote increased testing is to invest in health promotion campaigns that provide education about STIs and the need for testing. Research has indicated that some of the

barriers to STI testing, especially chlamydia and gonorrhea testing, among adolescents and young adults springs from limited knowledge of STIs and misperceptions about the seriousness of STI diagnosis.<sup>7</sup> Therefore, campaigns which provide education about STIs and the importance of testing may be a way to increase self-initiated STI testing. Both the content of the message promoting testing and the medium through which the message is delivered are important. While there is limited evidence about programs that effectively promote self-initiated screening among adolescents, researchers have begun to identify what youth think are important messages to increase testing among their peers.<sup>58</sup> In a series of focus groups in 2003 with Massachusetts adolescents ages 16-24, participants suggested several messages that campaigns to promote chlamydia testing should deliver, including focusing on the positive aspects of testing, providing information about how chlamydia is treated, and encouraging youth to bring a friend to testing centers for support.<sup>59</sup> Further, a review of literature about women's perceptions of chlamydia screening found that women are more positive about screening if they have an understanding that chlamydia is common condition which can become serious and affect fertility.<sup>60</sup>

The message medium is also an important factor in campaigns to promote self-initiated STI testing. A 2008 study examined the success of different recruitment strategies of an initiative focused on increasing herpes testing among college students.<sup>61</sup> Authors examined students' uptake of testing based on where students were provided messages about testing. Recruitment efforts at the on-campus student health center had the most success. Health center staff were trained to inform students about herpes testing and direct students to testing if they were interested. Researchers also posted fliers in bathrooms, waiting rooms, and exam rooms at the health center. Of those students who tested, 33% reported hearing about testing at the health center, followed by 23% hearing about it from listserv messages, 20% via word of mouth, 17%

through class messages delivered at the beginning of select classes, and 7% via flyers posted on campus.<sup>61</sup> This study suggests that promoting testing among students already receiving services at campus health centers is a promising strategy. However, this strategy would not reach those students who never or rarely use the health center. In addition, focusing on school environments may miss adolescents and young adults who are not enrolled in school.

With the rise of Internet and cell phone use, especially among adolescents, several studies have explored using Internet or texting technology to promote testing. One randomized controlled trial in Australia focused on the effect of email messages to promote chlamydia testing among youth ages 16-25.<sup>62</sup> Participants in the intervention group received a personalized email from a physician, including links to the physician's credentials, which said the clinician would like to talk with the email recipient about chlamydia and getting tested. Youth could ask questions of the clinician via email and were also provided information on where to get tested.<sup>62</sup> For recipients who did not respond to the emails, additional emails were sent once per week for three months and then once per month for the last three months of the study. Youth in the control group were sent impersonal emails thanking them for participation in the study, which did not include any clinical advice about testing or any additional information. Intervention participants reported chlamydia testing at higher rates compared to those in the control group (52.5% vs. 31%).<sup>62</sup> Email communication may present an effective way to communicate with college students about STI screening with minimal costs.<sup>62</sup>

Another randomized control trial examined the use of text messages and the effect on STI knowledge and testing among people ages 16 to 29. Short messages about STI prevention were sent via text message and email to the intervention group at regular intervals.<sup>63</sup> After one year of the intervention, participants in the intervention group had significantly higher scores on tests



measuring STI knowledge, compared to the control group. This was true for both male (OR= 3.19, 95% CI 1.52-6.69) and female (OR= 2.36; 95% CI 1.27-4.37) participants.<sup>63</sup> Female participants who received the intervention reported higher rates of STI testing (OR=2.51; 95% CI 1.11-5.69) and talking with a doctor about sexual health (OR=2.92; 95% CI 1.66-5.15), compared to females in the control group. Recipients of the text messages also provided positive feedback about receiving the messages.<sup>63</sup> This study offers promising results about the use of text messaging to promote STI testing; however, only 34% of participants completed all follow-up, so further studies may be warranted.<sup>62</sup>

In addition to technology, the use of peer education has been explored as a way to promote STI knowledge, encourage safer sex behaviors, and promote self-initiated testing.<sup>64</sup> Peers and other social factors can influence adolescent health beliefs and behaviors, including sexual health behaviors. Peer education programs have become popular interventions, but evaluations of their effectiveness have not always been rigorous.<sup>65</sup> Kim and Free (2008) conducted a systematic review of literature about peer sexual health promotion programs to explore their effectiveness. Each of the interventions reviewed had different aims. The authors, however, found that the peer health education programs had very low effect on sexual health behavior. For example, there was no significant positive effect on condom use at last sexual intercourse (OR= 1.06; 95% CI, 0.92–1.21). On the other hand, the majority of studies showed improvement in knowledge about STIs and pregnancy.<sup>65</sup>

Few peer-led interventions have focused solely on increasing STI screening among participants. However, one intervention in San Francisco employed peer educators to promote STI screening through street and community outreach among adolescents ages 12 through 22.<sup>64</sup> Peer educators delivered a 15-minute education intervention with STI/HIV prevention messages,

information about STI screening, and information on “youth-friendly” clinics for sexual health services.<sup>64</sup> Data from the program showed that youth who had contact with a peer educator were more likely to report that close friends thought STI testing was important (OR=2.36; 95% CI 1.67–3.33) and that close friends had been tested for a STI (OR=1.98; 95% CI 1.40–2.79), compared to respondents in the same community who did not have contact with a peer educator. Youth receiving the intervention were also more likely to report that they planned on seeking STI screening in the next six months (OR=1.74; 95% CI 1.16–2.63).<sup>64</sup> These results are promising and indicate that the use of peers to promote STI screening should be further explored.

While strategies to provide health messages about testing are important, there are also several structural interventions within campus health center medical clinics that have been suggested as ways to increase testing among young adults. Structural changes at the clinic level can be used to both increase the number of new students coming to the clinic directly for self-initiated testing and to increase testing among students who are already being seen in the clinic for another issue. Research has indicated that there are several factors at the clinic level that can present barriers for young people including cost, appointment convenience, and concerns about confidentiality.<sup>6</sup> Several qualitative studies have identified characteristics that adolescents desire in an STI testing clinic. The availability of free or low-cost testing was mentioned in several studies as being an important factor in an adolescent’s decision to seek testing.<sup>66</sup> Adolescents with health insurance still desire low-cost testing, as many fear that parents would find about a test through insurance claims.<sup>66</sup> Other clinic factors that adolescents look for in a testing location are privacy, short waiting times for getting an appointment, short waiting times once patient has arrived for appointment, and quick results.<sup>66</sup> Studies that include female participants of all ages

have indicated that having a choice of different screening options and the ease of testing are important factors in promoting testing.<sup>60</sup>

Several structural interventions at the clinic level have been employed to encourage more self-initiated STI testing and reduce barriers among college student patients. One promising strategy that aims to make testing more convenient and efficient is the introduction of express testing-only visits for patients reporting no STI symptoms. While the exact context of an express visit varies across clinics, the idea behind the express visit is that patients can get STI testing without having to meet with a provider, have extensive pre-test counseling, or go through a lengthy visit.<sup>67</sup> For patients who are not experiencing any symptoms, appointments for STI testing can be streamlined and offered outside of provider appointments. Several public health organizations have promoted the idea of express visits as a way to make STI testing more accessible. Many agencies also recommend that non-clinical staff be allowed to facilitate the process of collecting samples for testing.<sup>68</sup> The North Carolina Division of Public Health has provided guidance about express visits through its Sexually Transmitted Diseases Public Health Program Manual, and promotes the use of standing orders to allow registered nurses to order STI testing for patients who deny symptoms.<sup>69</sup>

Express visits are facilitated by available testing technology that allows for non-invasive procedures for sample collection.<sup>32</sup> Testing for chlamydia and gonorrhea can be done on a urine sample for both men and women, testing for HIV can be done on a blood or oral sample, and testing for syphilis can be done on a blood sample. Adolescents have also indicated in several studies that they prefer these non-invasive collection methods.<sup>59</sup> Several qualitative studies have shown that adolescent females strongly prefer urine screening over a provider-collected vaginal swab. Pre-test preventive counseling is also not a required part of an express STI testing visit.

Several health organizations have recommended that preventive counseling not be required with STI testing, and pre-test counseling is not required under North Carolina law.<sup>70</sup>

Several health centers have implemented an express visit option with the goal of increasing STI testing and making clinic operations more efficient. One college campus health center at Old Dominion University (ODU), a Virginia public, four year university with about 20,000 students, altered testing procedures as a way to promote chlamydia testing and combat high rates of the STI among the student population.<sup>71</sup> ODU's Direct Access Chlamydia Testing program allowed students without symptoms to walk in for testing at ODU's health center. As a part of this initiative, testing kits were available for purchase for \$13 from the health center's front desk. The kits included instructions on how to collect a urine specimen, along with the necessary collection tools and a fact sheet about chlamydia. Students then provided a urine sample at the lab. Regular testing by appointment with a provider was also still available. Direct access testing was paired with a campaign to promote awareness of chlamydia and testing services available. During the year that changes to the testing appointment process were made, the percentage of students screened for chlamydia increased by 27.9% from the prior year. Approximately 17.5% of the total number of students tested had a positive result. While the vast majority of students still opted to see a clinician prior to testing, those students who used the direct access option had a higher chlamydia positivity rate (22%), which may indicate that this option was favored by high-risk students.<sup>71</sup>

Many other university health centers have adopted a similar type of fast-track testing. For example, the University of California Santa Barbara allows students to pick up order forms for STI testing at the campus health pharmacy and walk in to the laboratory to provide the necessary samples. Results are then sent to students through the health center's electronic message

system.<sup>72</sup> The University of Maryland also offers an express visit option, in which patients receive brief health education about STIs from a laboratory technician, who then collects samples for testing. This option is promoted as a low-cost option, with testing for gonorrhea, chlamydia, hepatitis, syphilis, and HIV costing \$49 total out-of-pocket cost.<sup>73</sup>

In addition to college health centers, some community-based health clinics have implemented express visits to reduce patient waiting time and increase the number of patients the clinic could serve. For example, one busy STI clinic in Denver implemented a process for identifying low-risk, asymptomatic patients that could be screened for STIs without a physical exam.<sup>67</sup> Patients visiting the clinic, either through walk-in or a previously scheduled appointment, were screened for risk by a medical assistant. Those patients considered low risk were then allowed to participate in the express visit services.<sup>67</sup> The intervention reduced patient waiting time prior to testing. For women, there was more than one hour waiting time difference between the express visit and the provider visit. For men, there was a difference of more than 30 minutes. In addition, the clinic was able to increase testing appointments by more than 8% after implementing the fast-track approach.<sup>67</sup> Express testing appears to be a viable solution for both university and community medical providers.

Some university health centers have employed peer counselors to provide STI screening as a part of express visits. These systems are similar to express visits, as the patient does not meet with a physician or other clinician. Instead, a peer educator or other health educator provides general information about STIs. For example, San Francisco State University offers chlamydia, gonorrhea, HIV, and syphilis screening for asymptomatic patients through its Peer STI Education Clinic (P-SHE). Patients meet with peer counselors to get information about STIs, create a risk

reduction plan, and provide a sample at the laboratory. Results are communicated to the student from a clinician via an online portal or by phone.<sup>74</sup>

Changes in clinic structure and other initiatives to increase awareness among the general student body are important ways to increase patient-initiated testing. There are also strategies that can increase testing among patients already engaging with student health centers. Provider-initiated testing is testing that is recommended by a health care provider during clinic visits.<sup>75</sup> There are several different ways that clinics can approach provider-initiated testing, including opt-out and opt-in policies. In addition, testing can be offered to all patients or testing can be offered to only those patients who have an identified risk.<sup>75</sup> Provider-initiated testing is a promising strategy for promoting increased testing among college-aged patients, as youth are more likely to be tested if it is recommended by their provider.<sup>76</sup>

In opt-out approaches to provider-initiated testing, the consent for testing is included in the general consent for care. Patients must specifically decline the tests if they do not want to be tested.<sup>75</sup> In contrast to opt-out testing, with opt-in testing a patient must decide whether or not s/he wants to be tested.<sup>75</sup> North Carolina law allows consent for testing to be included in the general consent for care; but patients must receive information- verbally or in writing- that indicates they will be tested unless they decline.<sup>70</sup> Opt-out testing has been recommended by several organizations. The CDC recommends that HIV testing be offered via opt-out, with no separate consent and no pre-test counseling required. The agency recommends that everyone be tested regardless of risk identification.<sup>76</sup> Many clinics that have implemented opt-out HIV testing have seen an increase in the number of patients who test.<sup>77</sup> After implementing opt-out HIV testing, a STI clinic reported a decrease in HIV testing refusals. The clinic had a higher refusal rate before the implementation of opt-out testing; 38% of men who have sex with men (MSM)

and 27% of heterosexual patients declined HIV testing when offered, compared to 7% of MSM and 2% of heterosexuals refusing after the introduction of the opt-out policy.<sup>77</sup>

As a part of initiatives to promote chlamydia testing, several California school-based health centers implemented opt-out chlamydia testing for all new, sexually active patients.<sup>78</sup> Regardless of the reason for the visit, all new patients were screened for sexual activity and then testing was provided for those who reported sexual activity. Clinicians were reminded to screen and order testing by pop-up reminders in the electronic medical record. Clinics that incorporated these procedures, as well as additional promotion techniques, had double the rate of chlamydia tests compared to clinics that did not implement the program.<sup>78</sup> Studies have shown that women are receptive to chlamydia screening, even if it is initiated in a non-related medical visit.<sup>79</sup> In a study of screening at a university student urgent care center, 84% of women found it acceptable to be screened for chlamydia at an urgent care visit, even if the visit was unrelated to reproductive health.<sup>79</sup>

One novel approach to increasing chlamydia testing during clinic visits was implemented in several clinics in Northern California as a part of a randomized control trial.<sup>80</sup> In this approach, female patients ages 14 to 18 provided a urine specimen upon registration at the clinic, prior to any examination. During the patient's appointment with the provider, the patient was screened for sexual activity and the urine samples of all patients reporting sexual activity were transferred for chlamydia testing. Patients with positive results were contacted by their physician and treated. Clinics using this strategy screened 47% of eligible adolescent girls for chlamydia, compared to only 17% of eligible screened in the control clinics.<sup>80</sup> This study also identified successful methods for getting buy-in for increased chlamydia testing among clinic staff, including forming a working group from the start of the project to increase ownership and

troubleshoot issues.<sup>80</sup> Engaging patients that are already attending campus health centers is a promising approach for increasing the amount of students receiving STI tests. However, with opt-out approaches to testing, it is important that patients truly understand what they are being tested for and have the opportunity to decline without pressure.

### **Alternative Testing Strategies**

STI testing can also go beyond the clinic walls. Several strategies for locating testing services away from the clinic have been suggested as a way to increase testing uptake among college students. One promising strategy is for home-based self-testing. While home collection kits for chlamydia and gonorrhea testing have not yet been approved by the FDA, research studies have looked at adolescents' views on home-based chlamydia testing.<sup>66</sup> For home-based chlamydia and gonorrhea testing, testers collect a vaginal swab, which is then sent in the mail to the laboratory. In one study, half of the college women subjects reported they were likely to use the option of home-based testing. Respondents felt the home tests offered anonymity, privacy, convenience, and the ability to avoid a medical appointment.<sup>66</sup> Additionally, in focus groups conducted among 16-to 24-year-olds, authors found “overwhelming enthusiasm for using a home test kit, much like a home pregnancy test.”<sup>59,para 26</sup> In a 2006 study of home-based testing among female teens 14 and older, study advertisements offered online ordering or community pick-up of free chlamydia home testing kits. In follow-up questionnaires after completing testing, 90% of participants preferred home testing compared to clinic testing, 94% rated collection easy, and 86% said they would use the program again.<sup>7</sup> Investigators provided results via telephone and referred people with positive results to a treatment clinic. Investigators were able to verify that 95.1% of women testing positive sought treatment.<sup>81</sup> Even though home based testing may be a popular option, adolescents have reported some barriers to home testing including lack of



confidence in correctly collecting the sample and concerns about the safety of mail for sending samples.<sup>7</sup>

In 2012, the FDA approved home rapid HIV tests for sale over the counter. These tests, which cost about \$40, use a sample procured with an oral swab to detect antibodies to HIV and provide results to the user within 30 minutes.<sup>36,82</sup> Some public health experts believe home testing is an option that will get more people tested for HIV, especially those who may not want or be able to attend appointments at a doctor's office. However, some experts worry about people finding out a positive status when they are alone and the difficulties with surveillance and linkage to care for people who test without a health care provider.<sup>82</sup> There has been no research about the acceptability of home HIV testing among college populations. However, home testing alternatives for STIs may provide additional options that could increase the number of students who choose to test.

Outreach testing can also be offered by medical professionals or non-clinical providers at other sites, such as libraries, student unions, and social gathering sites, both on and off campus. Outreach testing is generally offered on specific days and for a specific amount of time when students are able to walk in for testing. Studies that have examined adolescents' views on outreach testing have found a wide range of results.<sup>66</sup> Some adolescent and young adult respondents voice appreciation for the convenience of outreach testing in areas that they often frequent. Others fear a loss of privacy in an outreach testing encounter.<sup>66</sup> Outreach testing has been a popular option for college populations. At UNC-CH, HIV testing is offered annually during an event to mark World AIDS Day, held in the beginning of December each year. In recent years, the event has drawn between 100 and 200 students for testing during a four- to five-hour period. Studies suggest that outreach testing tends to attract individuals who have not been

tested before. A 2012 study published in the *Journal of AIDS and HIV Research*, comparing outreach and clinic testing among students at UNC-CH, found that 61.7% of students tested at outreach events had never been tested for HIV before, compared to 44.1% of clinic testers.<sup>83</sup> In both outreach and clinic settings, the vast majority (100% of clinic testers, 99.5% of outreach testers) received post-test counseling and results of their test. In addition, the positivity rate of outreach testers and clinic testers was not significantly different.<sup>83</sup> However, success and acceptability of outreach testing is mixed. A 2006 review of chlamydia and gonorrhea testing initiatives in community settings found a very wide range of number of people testing and positivity rates of outreach testing initiatives.<sup>84</sup> This strategy offers another avenue for students to get tested and is a clear alternative for increasing the number of students tested.

### **Policy Evaluation**

The literature offers many promising strategies to increase the number of students receiving STI screening. In order to provide recommendations for the best suited interventions to promote increased STI screening at UNC-CH, six different policy alternatives are analyzed here through a set of evaluative criteria. The policies chosen for analysis are those that focus on structural changes in STI testing procedures at Campus Health Services (CHS) to promote increased testing. Health promotion strategies are not included in this analysis, as the exact content and implementation of those strategies is less clear and more difficult to analyze under these criteria.

The policy alternatives considered here are:

1. Continue with current clinic structure for STI testing
2. Offer express visits for STI testing
3. Offer express visits for STI testing that include meeting with sexual health educator

4. Introduce universal opt-out testing for all clinic visits
5. Increase outreach testing
6. Promote home-based testing

These policies are evaluated using six evaluative criteria: effectiveness, efficiency, stigma, autonomy, indirect effects, and feasibility. The first two criteria, effectiveness and efficiency, are interrelated. Effectiveness refers to how well the policy meets its goals or solves the problem, in this case, how well the policy increases number of students who are screened for STIs.

Efficiency refers to getting the greatest benefit for the least cost.<sup>85</sup> The third criteria, stigma, refers to whether or not the policy labels participants in a negative way.<sup>85</sup> Stigma is an especially important consideration when it comes to STI testing, as adolescents have reported that fear of stigma is a barrier to accessing testing services. The fourth criteria, autonomy, refers to how the policy protects and promotes individual choice and freedom. Fifth, indirect effects, refers to any consequences of the policy aside from the original goals. These effects could be positive or negative. Finally, feasibility refers to how likely and easily the policy could be incorporated in the clinic and how likely staff and administrators are to buy-in to the policy. Each of the policies is examined for application specifically at UNC-CH, however, the analysis is also applicable to other college health centers.

The first policy alternative is simply to continue offering STI screening services as they are currently offered at UNC-CH CHS. This would mean that testing services are still available at student request and that students must see a provider for testing. Providers may also choose to offer testing to students at the provider's own discretion. Testing services for HIV and syphilis would still be offered through the Carolina Health Education Counselors of Sexuality (CHECS) office. One way that the effectiveness of current policies can be examined is by looking at how

many current UNC-CH students report STI screening. According to the survey conducted in 2013, 48% of sexually active students in the representative sample of students report being screened for STIs.<sup>57</sup> While it is unclear how many of students were screened at UNC-CH CHS, this survey indicates that there is a need to improve STI testing rates. If policies were continued with no additions, it does not seem that UNC-CH would see a large increase in the number of students testing. In terms of efficiency, it is hard to specify current exact costs of STI testing at UNC-CH CHS. However, continuing current options for STI testing would not require any additional costs or training of providers or clinic staff. Current STI testing practices at CHS may present problems with stigma. Students must identify the reason for their appointment with a provider to CHS staff and must speak with a provider about their desire for STI testing. However, as most STI testing visits are done in the general medical clinic or Women's Health clinic, a student would not necessarily be identified by others in the waiting areas as being at CHS for testing. There may be slight stigma if student is seen by other students going to the CHECS office, as this office and CHECS staff are sometimes identifiable. This option does promote student autonomy, as students have to choose whether or not to test and must self-initiate testing behavior. This option is also feasible, as it is already in place. In summary, while continuing the current policies does meet criteria of stigma reduction, autonomy, and feasibility, it does not appear that it would allow CHS to meet the goal of increasing number of students testing for STIs.

The second policy alternative is to offer express visits for STI testing for asymptomatic students. While it is difficult to pin point the exact effect of this policy on increasing screening rates, express visit options have been shown to be effective at increasing testing rates in other places where it has been implemented.<sup>71</sup> For example, at Old Dominion University, chlamydia

screening rates increased by nearly 30% after the introduction of testing only visits. Students using the fast-track approach to testing also had a higher positivity rate (22%) compared to those who tested using provider visits (17%). This indicates that the express testing visits are also effective in identifying positive cases of chlamydia.<sup>71</sup> Express testing options also help to address some of the barriers that have been identified for adolescents in seeking testing, including having to talk to a provider, ease of getting an appointment, and clinic wait times.<sup>6</sup> This initiative would make the clinic testing process more appealing for students, and may serve to bring in students to CHS who have not previously used its services.

The option of implementing express visits for STI testing also appears to be cost efficient, as it makes use of existing staff members and resources. With this option, the volume of tests performed could be increased without increasing staff time needed to facilitate testing. This option also fully utilizes non-clinical staff members. A Denver clinic that implemented rapid visits for low-risk patients was able to increase testing appointments by more than 8% without adding additional staff.<sup>67</sup> One consideration when exploring the efficiency of this option is the staff time and resources that would need to be utilized to promote this option and counsel students with positive results. While the current CHECS counselors and other health promotion workers have the skills needed to promote this initiative, it would still take staff time to promote the express visit services.

This option has the possibility to decrease stigma, depending on how it is implemented. Students using this option would not need to talk a provider about their request for testing, nor would they need to undergo preventive counseling. Students would still have to identify the reason for their visit to front desk staff. If these visits are implemented in the same laboratory that serves all of CHS, students would not be identified by others waiting as being in the building

for STI testing. This policy does not appear unduly stigmatizing and may cut down on a student's discomfort speaking to a medical provider or concerns about being identified by peers. In addition, this policy is still respectful of students' autonomy. Students are still the decision makers and initiators of testing. Further, students would still have the option of meeting with a medical provider if they so desired. This policy alternative also seems to be feasible with current staffing levels at CHS and could be implemented with current testing technology. Notification of negative results could be done using the Healthy Heels portal, which is already utilized to notify students of lab results. Further, there are many other clinics, including college campus health centers, which have implemented express visits and could provide guidance on implementation. However, one issue that may present itself with this policy alternative is creating a protocol for positive results. Providers would need to notify students, and provide treatment, any additional testing needed, and partner services. Prior to implementation, there would need to be a protocol for dealing with positive results and ensuring that students are able to get services that they need. This policy may also present some unintended consequences—both positive and negative. If this alternative is successful in drawing new student visitors to CHS, it may serve to increase students' access and utilization of other CHS services such as counseling, nutrition therapy, or general wellness visits, as students become more familiar with CHS services. However, one possible negative unintended consequence is delivering positive STI test results to students who have received little counseling or preparation for a positive result. In an express visit, students would not be given the pre-test counseling that is currently provided. Therefore, they may be less prepared for receiving a positive result. In addition, missing a provider visit may mean missing an opportunity for health education or for the identification of other health issues. Despite these

challenges, it appears that implementing an option for express visits for asymptomatic STI testing is a strong policy alternative that should be considered.

A similar policy option is to offer express visits for STI testing that include meeting with a sexual health educator for preventive, pre-test or post-test counseling. This option has been implemented at other college campus health centers and is very similar to the current UNC-CH CHS practice of offering HIV and syphilis testing through the CHECS office. There is not a great deal of literature about the effectiveness of this approach in reducing barriers to testing and increasing number of students who seek out testing. It is likely that the addition of health education visits may present an additional barrier to students getting tested. This policy, if implemented at UNC-CH CHS, would make use of existing resources at the clinic, specifically the CHECS sexual health educators. However, providing this service would probably take up a great deal of the CHECS' time and take them away from population level sexual health promotion initiatives. In terms of stigma, students may be identified as waiting for a health educator or having to go the health educator office, which could reveal their reasons for being at CHS. Students would also have to speak with the health educator about their desire for a test, which may be problematic in terms of individual autonomy. Students would still be able to choose whether they wanted to be tested, but they would not be able to choose whether or not they wanted preventive counseling. It would be technically feasible to implement this policy, as this model is already in place for HIV and syphilis testing. Further, other schools have implemented similar policies for chlamydia and gonorrhea testing and could provide guidance. This policy has some potential positive side effects. As students are engaged in risk reduction counseling, it is possible that this may lead to increased knowledge of STIs and decreased risk behavior. Offering express STI visits with the requirement of meeting with a health educator

would build on current policies at UNC-CH CHS, but requiring the visit with the health educator may serve as a deterrent for students.

A fourth policy option is to introduce opt-out testing for all clinic visits. This option has been very effective in other clinic settings, decreasing refusals of STI testing and increasing the number of people tested.<sup>77</sup> In a trial, California school-based clinics that incorporated opt-out screening following a positive sexual activity screen had double the rate of chlamydia tests compared to clinics that did not implement the opt-out screening policies.<sup>78</sup> The introduction of opt-out screening circumvents the need for students to seek testing; even students who are not thinking about testing are approached with an offer of testing. However, this strategy only reaches students that are already engaged in medical care with CHS and it does not draw in any new visitors. It is also questionable as to whether this strategy would be cost efficient. While it may not require any additional staff to be hired, it may increase the time in clinic visits.

Offering opt-out testing to all students regardless of visit purpose also has the effect of reducing stigma. Everyone is offered screening services and people do not have to self-identify as being at risk in order to get a test. However, the policy may present problems in terms of autonomy. This policy technically allows students to opt out of testing, so it gives them a choice about testing. However, some public health practitioners have criticized opt-out testing as being coercive. This approach would have to be carefully monitored to ensure that it does not erode autonomy.<sup>86</sup> Especially in a busy medical clinic, it is essential to ensure that consent is truly informed and that students understand what they are being tested for.<sup>87</sup> There are also challenges to the feasibility of this strategy. It would require buy-in from virtually all providers and clinic staff; every provider will have to facilitate testing, which may prove challenging. It may require more initial work to get all staff on board. Providers have reported many barriers to



implementing routine testing, including lack of training or comfort in introducing the topic of testing, lack of time within clinic visits, and issues with consent and counseling requirements.<sup>50,51,88</sup> While these challenges could be addressed, it is likely that this option would require significant logistical problem solving prior to implementation. There may also be some indirect effects of this policy. A negative side effect may be if time is taken away from the original intent of the patient's visit in order to provide testing.

Yet another policy option is to increase outreach testing. Under this approach, UNC-CH CHS would seek out opportunities to provide testing outside of the CHS building. This could be accomplished in several ways. One common way that this has been implemented is to offer STI testing on a specific day and time in a location other than the health center. Outreach testing may be effective in reaching people who have not been tested previously. In a study comparing students who chose outreach testing to those who chose clinic testing, 61.7% of students tested at outreach events had never been tested for HIV before, compared with 44.1% of clinic testers.<sup>83</sup> Outreach testing may also help to remove barriers to testing and increase convenience. Although outreach testing events can draw a large number of students, significant staff time is required to prepare, plan, and promote events and ensure that all results are delivered. In a review of outreach testing for chlamydia and gonorrhea in community settings, authors found that while most people who tested positive received results and treatment, staff members providing testing often had to invest a significant amount of time in locating people to deliver results after the event.<sup>84</sup> In addition to challenges with delivering results, outreach testing can also take space and resources away from other campus entities where the testing is held. Finally, it would be difficult to charge students or their insurance through outreach testing because taking on that volume of paperwork and data entry outside of the clinic setting is not feasible. Therefore, CHS

may have to compensate for the cost of test kits and staff time without fee for service. Outreach testing may contribute to stigma for students who get tested. Outreach testing events are typically highly publicized with information on where and when they are happening. In addition, students often have to wait during outreach events and may be seen by their classmates waiting at the test site. As a result, students may feel stigmatized or singled out if they choose to participate in outreach events. Increased outreach events do promote students' autonomy as they are still given the choice about whether or not they want to be tested. This option would also be technically feasible, as this type of outreach testing is already performed once a year at World AIDS Day. It is also feasible to use most testing technologies in an outreach setting. However, this option would take a lot of staff time, so there would have to be significant staff buy-in. There may be some positive indirect effects, such as an increase in awareness of STIs, as people see advertisements or information about testing. While outreach testing has promise for promoting testing among students not currently using the health center, it does not appear that this option is sustainable or feasible in the long term.

A final option to increase STI testing is to promote the use of home-based testing among students. Home-based testing has been demonstrated to be an acceptable option to adolescent testers.<sup>7,59</sup> In one study, 90% of adolescents who used at-home chlamydia tests preferred home testing over clinic testing.<sup>7</sup> This option may remove many barriers for students by promoting ease of ordering and not having to talk to anyone about the test. However, in order to effectively increase the number of students tested with the home option, this option would have to be promoted and advertised among students. While this method would not require many staff resources and therefore may be cost friendly for the clinic, test kits available at home are more expensive than those used in the clinic. For example, the OraQuick rapid HIV tests used in the

clinic cost about \$15 per test. The tests sold over the counter cost the user about \$40 per test.<sup>82</sup> Therefore, this option is not very cost efficient for the user. This option does seem to reduce stigma, as tests can be ordered online and conducted in the privacy of a user's home. In addition, it also promotes autonomy, as students can choose whether or not to be tested. However, this option is not very feasible for wide-scale implementation for several reasons. First, home-based chlamydia and gonorrhea tests do not currently have FDA approval, making it unlikely that UNC-CH CHS would promote their use. It seems that university officials would also worry about positive results and people receiving those results in an unsupported environment or not seeking treatment for a positive result. Second, there could be some negative indirect effects of this policy, including an increase in false positive results. False positive results are more likely with the home rapid HIV test.<sup>82</sup> In addition, a referral network would have to be in place to allow easy access to treatment and care for people who test positive. Given the lack of feasibility of home testing, it does not appear that this policy is a viable option at this time. It is an option that could be further explored as test technology is further developed and there is more evidence about the effect of home tests.

Table 2 summarizes each of the policies and intervention alternatives for UNC-CH CHS to expand STI screening. The degree to which the proposed policies meet each evaluative criterion can be used to help select a policy. Many of these policies are not mutually exclusive. For example, UNC-CH CHS could choose to both offer express visits for STI testing and increase outreach testing. Based on these evaluative criteria, it appears that the most promising option for implementation at CHS is the implementation of express visits for asymptomatic STI screening or the introduction of universal opt-out testing. Recommendations based on these criteria are outlined in the final section.

**Table 2: Policy Alternative Matrix**

<b>Policy Alternative</b>	<b>Effectiveness</b>	<b>Efficiency</b>	<b>Reduces Stigma</b>	<b>Promotes Autonomy</b>	<b>Feasibility</b>	<b>Indirect Effect</b>
Continue with current clinic structure	_____	+	_____	+	+	_____
Offer express visits for STI testing	+	+	+/_ _____	+	+	_____
Offer express visits for STI testing that include meeting with sexual health educator	+/_ _____	_____	_____	+/_ _____	_____	+
Introduce universal opt out testing for all clinic visits	+	+/_ _____	+	+/_ _____	_____	_____
Increase outreach testing	+/_ _____	_____	_____	+	_____	+
Promote home-based testing	+/_ _____	_____	+	+	_____	_____

Chart Key: + Meets Criteria or Positive Effect; +/\_ \_\_\_\_\_ Does Not Fully Meet Criteria or Mixed Results; \_\_\_\_\_ Does Not Meet Criteria or Negative Effect

## **Recommendations**

Based on these policy evaluative criteria, UNC-CH should explore the following options to improve STI screening rates among students:

- Offer express visits for STI testing. Of all of the policy alternatives, this option seems to be the best route for expansion. This could easily be accomplished with current clinic staff and structure. Further, express visits help to address several barriers that adolescents and young adults have reported. It is not recommended that visits with a health educator be required for the express visits. However, given that Student Wellness currently employs health educators who can fill this role, health education sessions should be offered to students and all patients as an optional compliment to the express visit.

In order to successfully integrate express visits into the clinic, UNC-CH CHS administration should seek staff buy-in from all departments and staff members. This option will also need to be promoted among students at UNC-CH so that they will be able to take advantage of the service. CHS should work closely with Student Wellness and seek support of student leaders to promote this option. The express visit option should be evaluated to monitor provider and patient satisfaction and to see if this option does increase the number of unique patients tested, compared to those testing at the clinic prior to implementation. Evaluation could also include comparison of STI prevalence among patients choosing the express visit, compared to those who are tested in a regular clinic visit. This may provide information about whether the express visit helped to reach higher risk students.

- Explore the possibility of universal opt-out testing. This is a very promising strategy to increase uptake of STI testing among current clinic patients. However, this option will impact the day to day work of many of the clinic staff. Therefore, UNC-CH CHS should spend extra time to explore this option with staff and with students. CHS should consider conducting brief surveys with current student patients about their thoughts on this policy change before implementation.
- At this time, it is not recommended that CHS spend a great deal of resources increasing outreach testing, primarily because of the large amount of resources that outreach testing absorbs. It is also possible that the express visits will be an adequate stand-in for outreach testing, as some of the benefits of outreach testing, such as convenience and ease, are also met by the express visits. CHS should continue its annual HIV testing outreach event, as that event has proven useful in recruiting new testers. After the implementation of the express visit, the clinic should explore the utility of adding additional outreach testing, if needed.
- For all STI testing services offered at CHS, the clinic should review the cost of testing. Given that cost of tests is a significant determinant for whether youth seek testing, testing should be at the lowest price possible. UNC-CH could look to see if it is feasible to offer no-cost testing or look to other avenues to offer testing at a significant discount. UNC-CH should also be clear about test coverage under insurance plans and possibly offer discounts for those who are unable or unwilling to use insurance.
- All testing initiatives should be accompanied by population-level health education and promotion of testing among students. Offering new services in the clinic without accompanying information and promotion is not likely to increase student uptake of

testing. UNC-CH CHS has several assets at its disposal to assist with promotion, including the CHECS counselors, the student sexual health peer educators, and other Student Wellness staff. CHS should explore some of the promising strategies listed in this paper for promotion of testing: including email, text messaging, and peer health educators. Promotion campaigns should address barriers that have been identified including knowledge about asymptomatic STIs and their seriousness, treatment options, and confidentiality of services.

- Ensure that results delivery and follow up with positive results is streamlined and effective. Literature shows that receiving quick results is important to adolescents seeking STI testing services, so it is important that this process be streamlined. The existing health education counselors can serve as a supplement to providers to offer patients additional support and education after a positive test result.
- UNC-CH could also explore more formal relationships with clinics offering STI testing in the greater Chapel Hill Community, including the Orange County Health Department and Planned Parenthood. These organizations offer a valuable resource for both students and non-student sexual partners of students. For students who are unwilling or reluctant to test at CHS, these organizations can offer a back-up resource.
- UNC-CH should also look at available data sources to see if additional data would further support sexual health promotion activities, including increased screening. Surveys among students may help to identify student's knowledge of sexual health, specific barriers and desires for screening. In addition, CHS should attempt to identify if any groups of students may be at higher risk than others, so that education and testing promotion campaigns can be appropriately targeted. CHS should also work to identify clinics within

CHS that have higher screening rates than others to see if there are specific clinics or providers that could be targeted with additional information.

Each of the strategies to increase the uptake of testing should include a robust evaluation component, to evaluate both the outcomes of the strategies to increase testing and explore student satisfaction with these options. Getting student and staff input throughout the process may help to increase buy-in and make for stronger programs. Additionally, while this paper covers many strategies for increasing testing rates, there are additional strategies that are not discussed here. CHS should continue to explore strategies that similar college campus health centers have employed to increase testing.

### **Conclusion**

Screening for STIs, such as chlamydia, gonorrhea, HIV, and syphilis, is an important part of prevention, care, and surveillance. Given college student's high risk for STIs, initiatives to increase screening among this population are important and college health care centers play a key role in promoting increased screening. Student health centers must consider structural changes, such as the introduction of express STI testing visits, to address some of the barriers to testing. These structural changes should be paired with health promotion programs to encourage utilization of STI testing services. UNC-CH CHS has many assets, such as dedicated health education counselors, that can assist in implementation of new structural interventions to promote testing. As the clinic considers policy alternatives, CHS should continue to utilize policy evaluative criteria to identify alternatives best suited to help CHS meet the goal of increasing the number of students routinely screened for STIs.



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