

Spring 5-27-2017

# Chlamydia Screening in Women at a University Student Health Center

Jaime K. Carroll

*University of San Diego*, [jaimecarroll@sandiego.edu](mailto:jaimecarroll@sandiego.edu)

Karen Macauley

*University of San Diego*, [macauley@sandiego.edu](mailto:macauley@sandiego.edu)

Follow this and additional works at: <https://digital.sandiego.edu/dnp>

 Part of the [Family Medicine Commons](#), [Family Practice Nursing Commons](#), [Female Urogenital Diseases and Pregnancy Complications Commons](#), [Obstetrics and Gynecology Commons](#), and the [Primary Care Commons](#)

---

## Digital USD Citation

Carroll, Jaime K. and Macauley, Karen, "Chlamydia Screening in Women at a University Student Health Center" (2017). *Doctor of Nursing Practice Final Manuscripts*. 41.  
<https://digital.sandiego.edu/dnp/41>

This Doctor of Nursing Practice Final Manuscript is brought to you for free and open access by the Theses and Dissertations at Digital USD. It has been accepted for inclusion in Doctor of Nursing Practice Final Manuscripts by an authorized administrator of Digital USD. For more information, please contact [digital@sandiego.edu](mailto:digital@sandiego.edu).

Chlamydia Screening in Women at a University Student Health Center

Jaime Carroll, BSN, RN

University of San Diego

Hahn School of Nursing and Health Science

Beyester Institute for Nursing Research

4190 Madison Ave San Diego, CA 92116

Phone number: 760-519-1735

Fax Number: 619-260-7666

Email: [jaimecarroll@sandiego.edu](mailto:jaimecarroll@sandiego.edu)

Dr. Karen Macauley PhD, DNP, FNP-BC, GNP-BC

Director of Nurse Practitioner and Health Care Informatics Programs

University of San Diego

Hahn School of Nursing and Health Science

Beyester Institute for Nursing Research

## **Abstract**

The purpose of this evidenced-based project was to increase chlamydia pre-screening and screening in women under age 25 presenting with urinary symptoms. Interventions included chlamydia pre-screening alerts embedded into the electronic medical record. Three-month evaluation showed a chlamydia pre-screening rate of 100% and an increase in chlamydia screening by 9%.

## **Introduction**

### *Background*

Chlamydia (CHL) is a wide spread sexually transmitted infection (STI) in San Diego county, California, and the nation. CHL is also one of the most commonly reported STIs in the United States. Females between the ages of 15 and 24 are at the highest risk for infection. Women with CHL are asymptomatic approximately half of the time, often causing women to seek treatment late when serious side effects are present.<sup>1</sup> However, some women do have symptoms of CHL such as cervicitis, abnormal, thick vaginal discharge, bleeding and painful sex.<sup>1,2</sup> CHL can also cause typical symptoms of a urinary tract infection (UTI) such as dysuria.<sup>3,4</sup> It is estimated 10 to 50 % of women presenting with UTI symptoms in emergency care settings will have a STI such as CHL if tested.<sup>3</sup>

CHL can also lead to pelvic inflammatory disease (PID), a serious upper genital tract infection in women. PID can result in infertility, chronic pelvic pain, and an increased risk of ectopic pregnancy. In 2012, there were approximately 750,000 cases of PID in the United States. Approximately 10 to 20 % of women with CHL or gonorrhea (GC), if left untreated, will develop PID. Although PID can frequently be treated in an outpatient setting, hospitalizations for PID have increased in the last 10 years adding to overall healthcare costs. The estimated cost in 2012 for a patient with PID was 2,000 dollars, which translates into an annual cost of 1.5 billion dollars.<sup>2</sup> In the US the annual costs for CHL in 2008 (calculated in 2010 U.S. dollars) were 516.7 million.<sup>5</sup> Infertility associated with PID and CHL is approximately \$ 6,000 per patient.<sup>6</sup>

In the US in 2014, there were 1,441,789 reported cases of CHL. For the above reported cases 69.8 % were women, for a case rate of 627.2 per 100,000 females.<sup>7</sup> In 2013, the case rate for

CHL was 439.9 per 100,000 people in the state of California. California also ranked 23<sup>rd</sup> among 50 states in CHL infections. The CHL infection rate for California was two times greater in women than in men.<sup>8</sup> San Diego County found there were 15,626 cases of CHL in 2013. Similar to California, San Diego County showed the rate of CHL in females was over twice the rate in males.<sup>9</sup> Chlamydial infections are common and pose significant harm to the individual, community, state and nation. Therefore, it is important screening women for CHL especially in at risk populations.

The SHC, where the project was implemented, collected data on CHL screening and compared it to the American College Health Association (ACHA) statistics. According to the ACHA benchmarking committee, 58% of the time the SHCs surveyed were compliant with the Centers for Disease Control and Prevention (CDC) CHL screening guidelines for women in spring of 2015.<sup>10</sup> The project site screened for CHL in women per CDC guidelines 44% of the time.

### *Synthesis of the Evidence*

The United States Preventive Service Task Force (USPSTF) recommends sexually active women under 25 have CHL screening.<sup>11</sup> The Centers for Disease Control and Prevention (CDC) guidelines recommend annual CHL screening for sexually active women under 25.<sup>12</sup> Two systematic reviews completed by the USPSTF (2007, 2014) confirm screening for CHL decreases the incidence of PID and improves health outcomes.<sup>13-15</sup> The most recent evidence for screening according to the USPSTF is Grade B evidence. Grade B evidence recommends providing a service because the net benefit moderately out weighs the net risk. The recommendation is a moderate level of certainty. This classification means the available

evidence is sufficient enough to provide the preventative service. The USPSTF recommendation is classified this way instead of a high level of certainty because one randomized control trial reviewed by the USPSTF in the 2014 systematic review had mixed results on screening for CHL.<sup>11</sup> The CDC guidelines are more specific than USPSTF because it recommends yearly CHL screening for sexually active women under 25. The CDC states although there may be higher incidences of CHL in women 25 and older in some communities, the overall burden of disease is in women younger than 25.<sup>12</sup> The American Congress of Obstetricians and Gynecologists (ACOG) and American Academy of Pediatrics, recommend annual CHL screening in sexually active women 25 and under.<sup>15</sup>

To increase CHL screening, one systematic review found 27 articles and a total of 30 different programs. These programs took place in educational settings. The researchers suggested screening provided during classroom based settings, annual physicals/health examinations at SHCs, as well as conducting opportunistic screening at SHCs screened the greatest number of patients. Across all the opportunistic screening programs at SHCs, 13,006 CHL screenings were conducted. A detailed description of the type of opportunistic screening was not available from all of the programs, however some did state the types of interventions were advertisements around campuses, receptionist approaching patients with information about screening, and nurse/doctor offering screening after consultation.<sup>16</sup> The screening intervention used in the EBP project is similar to providing opportunistic screening to patients after nurse/doctor consultation.

Another systematic review in the primary care area analyzed 11 randomized control trials and five observational studies. The review determined six intervention strategies were helpful to

increase CH screening.<sup>17</sup> Two strategies from that review were included in this EBP project. The intervention strategies included computer alerts for providers in the electronic medical record (EMR) and education workshops for the clinic staff about the importance of CHL screening. In the systematic review, the computer alerts increased screening from 10.6% to 12.2% and the education of staff increased screening from 12.4% to 15.5%.<sup>17</sup>

### *Rationale*

The specific trigger to increase CHL screening rates in women presenting to the SHC was the lower CHL screening compliance rate compared to the ACHA's findings. Staff also noted that many women who presented with urinary symptoms were not always screened for CHL. Additionally, there was no formal template in the electronic medical record (EMR) in dysuria visits to identify CHL screening. Pre-data, from 2015, at the project site indicated there were 320 dysuria visits for women under age 25. About 6% of those dysuria visits had a CHL screening ordered. A total of 129 CHL screenings were ordered during 2015 but not necessarily during dysuria visits. Other visits that had a CHL screening ordered included vaginitis, annual physical, and encounter for STI screening. There were also 3 positive CHL tests in 2015, however these positive tests were not associated with dysuria visits. The decreased CHL screening compliance rates at the project site compared to the ACHA's findings, anecdotal and staff findings prompted the EBP project. The pre-data collected further supported the need for improvement in CHL screening during dysuria visits. Several interventions from the above systematic reviews were utilized in the project to increase CHL screening.

### *Purpose*

The purpose of this EBP project was to increase CHL pre-screening and screening in women under age 25 who presented to the SHC with urinary symptoms over a 3-month period.

## **Methods**

### *Definitions*

In order to increase CHL pre-screening and screening a multifaceted program was implemented. In the context of this EBP project, pre-screening was defined as the process of determining if a patient was indicated for CHL screening. Screening was defined as the actual CHL test ordered.

### *Interventions*

The program implemented had six main components. First, an educational presentation was provided for all clinic staff to understand their role in the EBP project. The educational presentation also emphasized the importance of CHL screening in sexually active women under age 25. Second, an optional pre-visit questionnaire was generated for female patients presenting with urinary symptoms. This questionnaire was available online to female patients who booked an appointment through the online SHC portal. The questionnaire contained a pre-screening assessment template. This template had questions presented in an easy to understand format. After the patient finished the questionnaire the completed pre-screening assessment template was then embedded into EMR. Third, if the patient did not use the questionnaire the pre-screening assessment template was inserted into the subjective section of the EMR encounter note for the provider to complete. The first question of the pre-screening assessment template asked about sexual activity. If the patient was sexually active, then the template continued with these three

options; no prior STI screening, STI screening greater than 1 year or STI screening within the last year. CHL screening was indicated if the patient was sexually active and had no prior screening or the last screening was over a year ago. Additionally, a provider could order CHL screening if clinically indicated based on provider judgment. Such situations may have included, but were not limited to, a patient presenting with symptoms in addition to urinary complaints or recent change in sexual partner. Fourth, mandatory pre-screening alerts were created in the plan portion of the encounter note. The pre-screening alert options included; GC/CHL screening not indicated, GC/CHL screening indicated, ordered, GC/CHL screening indicated, patient declined, and other. The provider had to choose one of the above options before the patient was discharged. Fifth, if indicated for screening, the patient received one of three tests (urine, self-collected vaginal swab or cervical swab). It is worthy to note that the project site had not used self-collected vaginal swabs until this program. A self-collected vaginal swab instruction sheet was created and posted in the restrooms. Staff was also educated on how to instruct patients on how to use the self-collected vaginal swabs. The final aspect of the program was CHL screening education. The provider had the option to choose if screening education information would appear on the patient's discharge paperwork. The screening education information stated, the CDC recommends women under age 25 have annual GC/CHL screening.

### *Implementation*

The EBP project proposal was submitted through the campus institutional review board (IRB) and approval was obtained under exempt status on August 30, 2016. The pre-data collected was collected prior to the implementation and included the number of dysuria visits, number of CHL screenings ordered, and the number of positive CHL screenings in 2015.

The EBP project program began on September 1, 2016. The educational presentation was held at the site's staff meeting in August 2016. The staff educated included five providers, three nurses, three medical assistants, three receptionists, and one office manager. The supervising physician, clinic director and supervising nurse were the three champions and vital to the success of this EBP project. Since the champions were multidisciplinary, the Iowa model was selected to guide this EBP project because it focuses on interdisciplinary teamwork. The Iowa model also provides a helpful guided step-by-step process to implement EBP.<sup>18</sup>

Post-data were collected through out the 3-month trial (September 1<sup>st</sup> to November 30<sup>th</sup> 2016). The post-data collected included the number of women under age 25 pre-screened for CHL, the amount of women who declined screening, the number of women who were not indicated for screening, and the amount women that fell under the option labeled other. Also collected was the number of CHL screenings completed during dysuria visits along with the number of positive and negative CHL results. The race and specific age of the women pre-screened and screened for CHL was accounted for as well. Lastly, the amount of women educated on CDC guidelines for CHL screening was collected.

## **Results**

To evaluate the EBP project's success, EMR data were analyzed. There were 110 dysuria visits over the implementation period (September 1 to November 30, 2016). Table 1 summarizes the amount of CHL pre-screening done pre and post intervention in dysuria visits in a control chart. The post-intervention period showed a significant desirable trend in CHL pre-screening rates. In the post intervention period, there were no missed opportunities to pre-screen for CHL. In other words, of the 110 dysuria visits, 100% received CHL pre-screening. The pre-intervention or baseline period showed a significantly undesirable trend in CHL pre-screening

rates. There were 96% missed opportunities to pre-screen and ultimately screen for CHL in the baseline period.

Table 1. CHL Pre-Screening Rate in Dysuria Visits

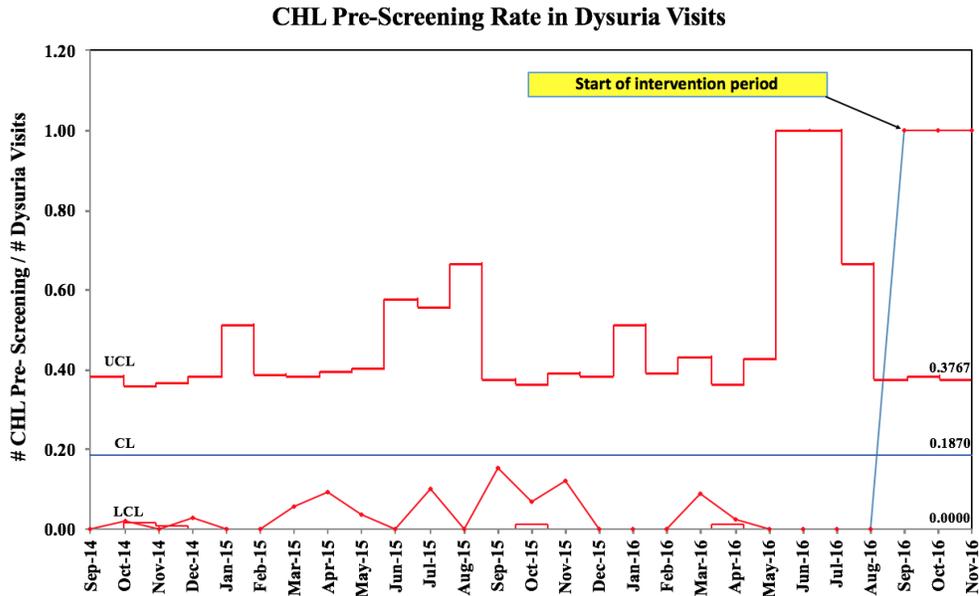
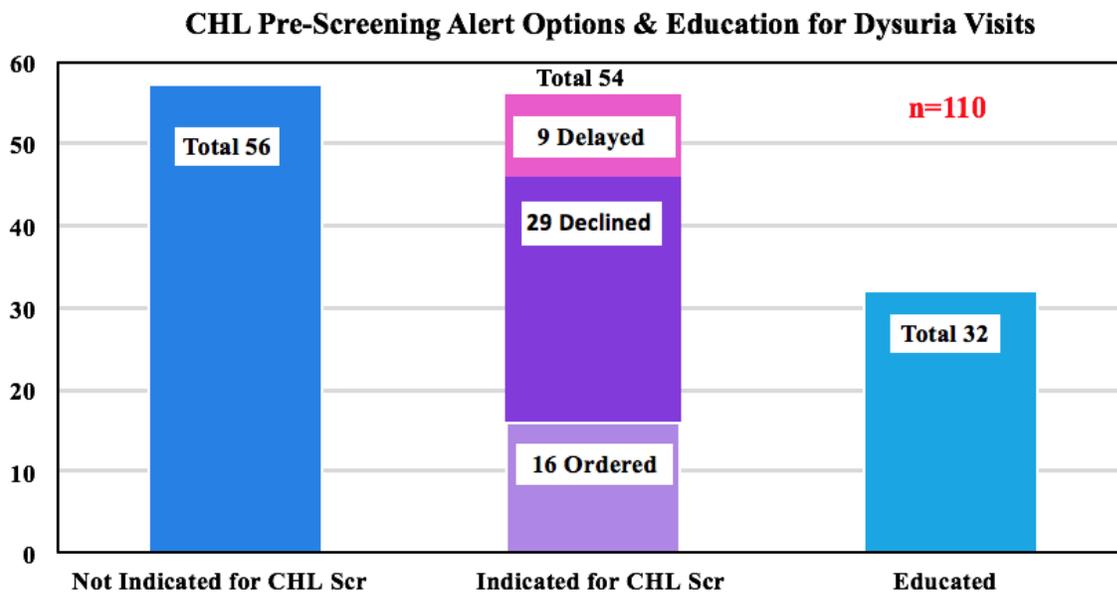


Table 2 shows the CHL pre-screening alert breakdown of the 110 dysuria visits in a bar chart. The amount of women not indicated for CHL screening was nearly 51%. The amount of women indicated for CHL screening was 49%. Approximately 54 % of the women indicated for CHL screening declined testing. The other or delayed screening option was nearly 8% of the women indicated. The indicated and ordered option accounted for about 30% of the women indicated for CHL screening.

There were 16 CHL screenings/tests ordered from the 110 dysuria visits. This was about a 9% increase in CHL screenings/tests ordered from the baseline period. Table 2 also summarizes the amount of patients educated on the CDC CHL screening guidelines. Specifically, of the 110 dysuria visits, 29% of the women were educated about CHL screening.

There were two positive CHL results during the three months of data collected. In 2015, in pre-data collected, there were only 3 positive CHL screenings in this patient population. These positive screenings also were not associated with dysuria visits. After only a three-month period, two positive CHL results were identified, only one result away for the amount of positive CHL results for the entire year in 2015 in this specific patient population.

Table 2. CHL Pre-Screening Alert Options & Education for Dysuria Visits



The ethnicity of the 110 women pre-screened for CHL were 56% Caucasian, 20% Hispanic, 10% multi-racial, 8% Asian, 6% of an unknown race. Of the 16 CHL screenings ordered, 56% were from Caucasian females, 19% from multi-racial females, 13% from Asian females, 6% from Hispanic females, and 6% from females of an unknown race. Women age 21 had the highest number of CHL pre-screenings followed by age 20, 22, 19, 18, 23, and 24. Of the 16 CHL screenings ordered, women age 20 accounted for the most CHL screenings followed by age 22, 18, 19, 21, 23, and 24.

## **Discussion**

### *Implications for Practice*

There are several implications for practice after implementing this EBP project and analyzing the data. Increasing CHL pre-screening was associated with increased CHL screening rates. The increased screening may prevent the spread of CHL at the university and in the community. By early recognition of CHL in the two positive cases, this could have likely prevented PID and infertility related costs for these two patients. Specific parts of the EBP program may translate well and be used at other SHCs. The mandatory pre-screening alerts were especially useful in increasing CHL screening because they could not be avoided in the encounter note. The pre-screening alerts had to be completed before discharge. This EMR change was relatively simple and had a significant impact on the amount of CHL screenings ordered. This project showed EMR alerts are an effective way to remind staff to screen for CHL during dysuria visits.

It is important to investigate further some aspects of the program. It would be interesting to explore why some women declined CHL screening and if they declined, was screening education offered. Another aspect to investigate would be if the provider chose the other/delayed option of the pre-screening alerts, did this population of women ever receive CHL screening. To know the barriers and reasons for declination may ultimately help increase CHL screening at the SHC. Also there were three types of screening tests offered (urine, self-collected vaginal swab and cervical swab). The numbers of specific type of screening tests were not collected. It may be beneficial for the site to collect this data to see what test was used most and if this method was cost effective and feasible for the site. It would also be interesting to explore if the provider or the patient preferred one method of testing. Finally, for the women that were not indicated for

screening, it would be interesting to separate the amount of women who were not sexually active from the amount of women who received CHL screening within the past year.

The next steps for the project site would be to implement the mandatory pre-screening EMR alerts in other visit templates. These visit templates could include annual physical exams, well women exams, vaginitis, and of course visits directly related to sexually transmitted infection screening. Also the leadership of SHC could reeducate SHC staff to use the education option in the plan section of the encounter note. This could increase the amount of women educated on CDC CHL screening guidelines.

### *Conclusions*

The EBP project met the goal to increase CHL pre-screening and screening in women under age 25 who presented to the SHC with urinary symptoms. The EBP project outcomes were consistent with the evidence to both screen for CHL in this age group and to use specific interventions to increase screening. The practice changes made are a sustainable addition to the EMR at the SHC especially the mandatory pre-screening alerts. The efforts made by this project support the USPSTF and CDC guidelines.

## References

1. Chan PA, Janvier M, Alexander NE, Kojic EM, Chapin K. Recommendations for the diagnosis of *neisseria gonorrhoeae* and *chlamydia trachomatis*, including extra-genital sites. *Medicine and health, Rhode Island*. 2012;95(8):252-254.
2. Gradison M. Pelvic inflammatory disease. *American Family Physician* . 2012;85(8):791-796.
3. Shapiro T, Dalton M, Hammock J, Lavery R, Matjucha J, Salo DF. The prevalence of urinary tract infections and sexually transmitted disease in women with symptoms of a simple urinary tract infection stratified by low colony count criteria. *Academic Emergency Medicine*. 2005;12(1):38-44. doi:10.1197/j.aem.2004.08.051.
4. Tomas ME, Getman D, Donskey CJ, Hecker MT. Over diagnosis of urinary tract Infection and under diagnosis of sexually transmitted infection in adult women presenting to an emergency department. Patel R, ed. *Journal of Clinical Microbiology*. 2015;53(8):2686-2692. doi:10.1128/JCM.00670-15.
5. Owusu-Edusei K, et al. The estimated direct medical cost of selected sexually transmitted infections in the United States, 2008. *Sexually Transmitted Diseases*. 2013;40(3):197-201. doi:10.1097/olq.0b013e318285c6d2.
6. Ditkowsky J, Shah KH, Hammerschlag MR, Kohlhoff S, Smith-Norowitz TA. Cost-benefit analysis of *chlamydia trachomatis* screening in pregnant women in a high burden setting in the United States. *BMC Infectious Diseases*. 2017;17:155. doi:10.1186/s12879-017-2248-5.
7. 2014 Sexually Transmitted Diseases Surveillance. Centers for Disease Control and Prevention. <https://www.cdc.gov/std/stats14/default.htm>. Accessed April 1, 2016.

8. California 2015 State Health Profile - cdc.gov. <http://www.cdc.gov/nchhstp/stateprofiles/>. Accessed April 1, 2016.
9. Sexually Transmitted Disease in San Diego County 2014 Data Slides. 2015.   
<http://www.sandiegocounty.gov/content/dam/sdc/hhsa/programs/phs/HIV%2C%20STD%20&%20Hepatitis%20Branch/Data%20Slide%20Sets/2014%20STD%20Slides%20with%20Interpretation.pdf> Accessed April 1, 2016.
10. ACHA 2015 PAP and STI survey for calendar year 2014 data.   
[https://www.acha.org/ACHA/Resources/Pap\\_STI\\_Survey.aspx](https://www.acha.org/ACHA/Resources/Pap_STI_Survey.aspx). Published 2016. Accessed April 1, 2016.
11. Final recommendation statement. Chlamydia and Gonorrhea: Screening - US Preventive Services Task Force.   
<https://www.uspreventiveservicestaskforce.org/Page/Document/RecommendationStatementFinal/chlamydia-and-gonorrhea-screening>. Published December 2016. Accessed April 1, 2016.
12. Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2015. *MMWR Recomm Rep*. 2015;64(No. RR-3): 1-137.
13. Nelson, H. D., Zakher, B., Cantor, A. G., Daeges, M., & Pappas, M. Screening for gonorrhea and chlamydia: a systematic review for the U.S. Preventive Services Task Force. *Annals of Internal Medicine* *Ann Intern Med*. 2014; 161(12): 884-893.
14. Meyers DS, Halvorson H, Luckhaupt S. Screening for chlamydial infection: an evidence update for the U.S. Preventive Services Task Force. *Ann Intern Med*. 2007; 147(2):135-142.

15. LeFevre ML. Screening for chlamydia and gonorrhoea. U.S. Preventive Service Task Force recommendation statement. *Ann Intern Med.* 2014;161(12):902–910.
16. Jamil, M. S., et al. Chlamydia screening strategies and outcomes in educational settings: a systematic review. *Sexually Transmitted Diseases.* 2014; 41(3): 180-187.
17. Guy, R. J., et al. Efficacy of interventions to increase the uptake of chlamydia screening in primary care: a systematic review. *BMC Infectious Diseases.* 2011; 11(211).
18. Rycroft-Malone J, Bucknall T. *Models and Frameworks for Implementing Evidence-Based Practice: Linking Evidence to Action.* Hoboken: John Wiley & Sons; 2011.