

The Effects of Expedited Partner Therapy on Reoccurrence of Chlamydia Trachomatis

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## Abstract

Chlamydia trachomatis is the most common treatable sexually transmitted infection in the United States. The purpose of this evidence-based practice project is to reduce the rates of recurrence of Chlamydia trachomatis in males and females over the age of 17 at a public health clinic in Kansas City, Missouri metropolitan area over three months. Clinic-wide there is an average of 23 confirmed cases of Chlamydia trachomatis every three months. From mid-August to mid-November 2018, 25 patients tested positive for infection. Out of the 25 patients testing positive for Chlamydia trachomatis 14 were offered expedited partner therapy for each of their sexual partners with whom they had contact within the previous 60 days. Only 8 of those 14 patients accepted expedited partner therapy for their partners, which was an edited partner therapy acceptance rate of 57%. All 25 patients testing positive for infection, whether accepting or not accepting EPT, were asked to return for an infection check at three months after diagnosis to test for rates of recurrence of infection. Once EPT is found to be effective at reducing rates of recurrence of infection in the sexually transmitted infection department at the project site, the intervention will be used on a permanent basis to reduce rates of recurrence clinic-wide and in the community.

*Keywords:* chlamydia, partner notification, partner referral, and expedited partner therapy

### The Effects of Expedited Partner Therapy on Reoccurrence of Chlamydia Trachomatis

Chlamydia trachomatis (CT) is the most prevalent treatable sexually transmitted infection (STI) in the United States (Centers for Disease Control and Prevention [CDC], 2015). Infection is transmitted through vaginal, anal, and oral sex (CDC, 2015). Women, minorities, the poor, adolescents and young adults are disproportionately affected making them the most vulnerable populations (CDC, 2015). In women, there are rarely symptoms of these infections resulting in easily transmittable infections between partners (Wysocki, 2015).

The impact on an individual's health can extend beyond the initial infection. Not only can these infections cause sequelae, but the cost to the healthcare system increases if infections are left untreated causing complications to occur. Chesson et al. (2013) estimated lifetime costs of the most common STIs and found that the United States spends approximately \$15.6 billion in total direct cost for the treatment of all STIs. The authors estimate that one case of pelvic inflammatory disease (PID), which is most commonly caused by CT and/or Neisseria gonorrhoea (GC), can cost an average of \$3202 per case. In females with CT they predict the lifetime cost of each case of CT to be \$364 for women in the United States. Chesson et al. (2013) assessed that the United States spends on average \$516.7 million annually on the treatment and care of patients testing positive for CT. The burden on the health care system is evidenced in the amount spent on initial treatment and then sequelae of infection.

#### **Local Issue**

National rates of CT have been at a steady state over the past few years but have risen drastically over the past two decades (CDC, 2014). The latest data, from 2016, reports the national rates of CT at 528.8 per 100,000 population (CDC, 2017). These rates are much lower when compared to the rates in Jackson County, Missouri, where Kansas City is located and

which ranks 51 for metropolitan areas in the country with CT rates of 846.5 per 100,000 population (CDC, 2017). In comparing these rates, there is a disparity in national and local rates. Jackson County is 1 of 4 counties in Kansas City, Missouri, which is the largest city in the state of Missouri. Clay County, Missouri, borders Jackson County to the North. In Clay County in 2017, rates of CT were 379 per 100,000 (Mid-America Regional Council, 2017). At the project clinic site in 2018, on average, rates for CT are 96 out of an estimated 652 patients presenting specifically for STI testing to the STI and Women's Health Clinics, according to clinic registered nurses (personal communication, November 18, 2018).

The CDC (2012) addresses disparity in STIs by explaining that poverty, income inequality, high unemployment rates, and low education are contributing factors. Rates vary depending on gender, age, and ethnicity. According to the CDC (2014), females have twice the rate of infection as men for CT. People between the ages of 15 and 25 have the highest rates, and African Americans have two times the average for CT. Because rates of CT are highest in sexually active, African American females between the ages of 15 and 25, the rates of recurrence in this group will be included in this evidence-based practice (EBP) project (CDC, 2014). However, since historically most of the cases of CT at the local clinic exist in the population over the age of 17, for this study, the age range will include those patients over the age of 17. Also, this study will include both male and female patients as requested by the clinic medical director. The goal of the current STI treatment protocol at the local clinic is to reduce the rate of CT in the population at the local clinic and Kansas City by providing treatment to partners of patients testing positive for CT infection. The current clinic protocol, which is currently being utilized, differs from the proposed protocol in that it allows for partners of index patients to be treated

only if they present to the clinic for treatment. For STI exposed partners to be treated by the clinic they must return to the STI clinic for their prescriptions.

### **Diversity Considerations**

Within the population of patients at local clinic in Clay County, there is some diversity. In 2010, the African American population of Jackson County was 24% and Clay County was 7% (United States Census Bureau, 2015). However, the patient population in the STI clinic in 2018 consists of approximately 14% African Americans who are poor, underserved, and living in the urban area of Kansas City (personal communication, November 28, 2018). When discussing evidence-based practice (EBP) projects in this population one must understand that there are tremendous disparities in the health outcomes of the African American population in the United States. The Office of Disease Prevention and Health Promotion (2014) in *Healthy People 2020* addresses these disparities and makes it part of their goal for 2020 to reduce inequities in health. The National Institutes of Health (NIH) discusses not only ethnic minority health disparities but also the lack of health research in this population and calls for more research to address these disparities (Kao, Hsu, & Clark, 2004). This EBP project will help address one key disparity in this diverse patient population at the local clinic, the rate of chlamydia in the African American community. In the United States, chlamydia rates are 5.7 times higher in African American females and 7.3 times higher in African American males than their white counterparts (CDC, 2017). Also, although nurses are generally trusted by the public, recruitment in minority populations can be challenging due to mistrust and past abuse in research (Knobf et al., 2007).

## **Problem and Purpose**

### **Problem Statement**

CT is the most prevalent treatable sexually transmitted infections affecting the female genital tract and can result in long term sequelae including PID, infertility, ectopic pregnancy, and chronic pelvic pain (CDC, 2015). Traditional partner notification (TPN) methods, which consist of index patients notifying their sexual contacts about possible exposure and need for treatment, have shown to be minimally effective in reducing reinfection rates (CDC, 2015). Expedited partner therapy (EPT), the practice of providing sexual contacts of index patients testing positive for infection with the same medications without the contacts assessed by a medical provider, has been studied extensively and is effective in reducing the rates of reinfection of this most common infection (CDC, 2015). Combined with screening and TPN, EPT reduces rates of CT infection (CDC, 2015).

### **Intended Improvement with Purpose**

Because rates of CT infection continue to rise, better interventions should be provided that aim at reducing these rates. CT screening guidelines along with patient treatment and TPN have shown to be ineffective in the surrounding counties and at the local clinic. The purpose of this DNP project is to implement, in the STI clinic, an EPT program that has already been found nationally to reduce rates of recurrence of CT in male and female patients who test positive for infection. The primary concern is if EPT, which is an already established effective program for CT treatment by the CDC, will be accepted by the patients at the local clinic. It is hoped that the program validates that patients at the local clinic would accept EPT, thereby reducing rates of recurrence of CT at the clinic, as has been achieved in research studies.

### **Facilitators and Barriers**

The local clinic is a public health clinic that is state and federally funded; therefore, the department has grant writers and providers that are comfortable with change based on EBP guidelines. The administration is focused on quality care for patients and typically welcomes new ideas for improvement in quality. The medical team in the STI clinic are willing to use and support the proposed project with new evidence for practice. The main barrier to overcome is the resistance to change from the support staff in the STI clinic. It will be difficult to implement new ideas for the clinic if the support staff do not see the value or feel it will take more time for them with each patient. Also, there is an epidemiologist that may be reluctant to implement changes to practice that might initially require more time with each patient. Currently, the lead epidemiologist follows EBP guidelines in other areas of practice and has verbalized an interest in implementing a program using EPT. On an individual basis, the patients could be a barrier to implementing EPT if he/she does not understand the benefit of using this method to treat infection.

After the initial three-month program implementation, funds may need to be sought to continue this EBP change; therefore, a grant may be sought to cover ongoing costs. However, the state of Missouri currently funds the program, and it is foreseen that it will continue to provide funding. It is a barrier if no grant money or not enough grant money is received from an outside source or if funding is not continued by the state of Missouri. If a renewable grant is obtained or Missouri continues funding, then project sustainability is enhanced.

## Review of the Evidence

### Inquiry

Males and females at the local clinic in the STI department will be studied, and the following question will be answered: In sexually active adult males and females who present to a STI public health clinic in Missouri and test positive for CT, will EPT be accepted, thereby decreasing the rates of recurrence over a three-month timeframe when compared to those that use TPN strategies?

### Search Strategies

The databases searched were PubMed, CINAHL, and Cochrane. Also, Google Scholar search engine was used. Key search terms were chlamydia, gonorrhea, partner notification, partner referral, and expedited partner therapy. There were eight types of study design and six levels of evidence for studies and guidelines that were reviewed. Five studies were a compilation of systematic reviews of randomized control trials and were level one evidence per the hierarchy developed by Melnyk and Fineout-Overholt (2015). Three articles were single quantitative randomized controlled trials (RCT) and were level two. Two studies were observational in nature, and three were cohort studies at level four. Three articles were reviews of qualitative and/or descriptive quantitative studies and were evidence level of five. There were six qualitative studies, at level six. One protocol was reviewed along with three articles that were authoritative opinion and consensus on the subject and were level seven evidence.

### Evidence by Themes

**Effectiveness of EPT.** A total of 13 research articles evaluated the effectiveness of EPT as a treatment for partners of positive GC and/or CT patients (Althaus, Turner, Mercer, Auguste, Roberts, & Bell, 2014; Azariah, 2012; Batteiger, Tu, Ofner, Van Der Pol, Stothard, & Orr, 2010;

Cameron, Glasier, Scott, Young, Melvin, & Johnstone, 2009; Centers for Disease Control and Prevention, 2006; Golden, Whittington, Handsfield, Hughes, Stamm, & Hogben, 2005; Heijne, Althaus, Herzog, Kretzschmar, & Low, 2010; Hogben, 2007; Hosenfeld, Workowski, Berman, Zaidi, Dyson, & Mosure, 2009; Kissinger & Hogben, 2011; Kretzschmar, Satterwhite, Leichter, & Berman, 2012; Schillinger, Kissinger, Calvert, Whittington, Ransom, & Sternberg, 2003; Shiely, Hayes, Thomas, Kerani, Hughes, & Whittington, 2010). Only one study did not find a statistical significance in the reduction of recurrence rates of infection with the use of EPT (Azariah, 2012). Most studies found a statistically significant difference in rates of recurrence of GC and CT when partners were treated with EPT but found recurrence rates to be more effected when EPT was used to treat partners of patients positive for GC. One study noted that the cost of EPT combined with the associated efficacy would make it a cost-effective alternative to treat partners (Cameron et al., 2009). EPT was found to be a most reliable option for partners when they are unwilling or unable to seek treatment (Hogben, 2007).

**Index patient acceptance of EPT.** An index patient is a patient with an instance of a disease that is diagnosed and which leads to the discovery of others with infection. One qualitative study which explored patients' acceptance of EPT found that patients preferred other methods for treating partners, such as partner referral and bringing partners back to the clinic for treatment (Buchsbaum et al., 2014). Two other studies that were reviewed showed between a 50 and 55 percent acceptance rate by index patients for treatment of their partners (Mickiewicz, Al-Tayyib, Thrun, & Rietmeijer, 2012; Vaidya, Johnson, Rogers, Nash, & Schillinger, 2014, respectively). Patients were more likely to accept EPT for their partners if they had symptoms at the time of the initial appointment, if they had more clinic appointments, and if the medical provider was male (Vaidya et al., 2014). They were unlikely to accept EPT if their partner was

in the clinic with them that day or if their native language was other than English (Vaidya et al., 2014).

**Partner acceptance of EPT.** There was only one article, which was a level six qualitative study, that dealt with partner acceptance of EPT (Cameron et al., 2010). The study used pharmacy vouchers that were given by index patients to their partners to be redeemed at contracted pharmacies which would dispense medications for GC and/or CT (Cameron et al., 2010). Most index patients were very satisfied with the voucher program, but only 40 percent of partners redeemed their vouchers. The results of this study showed that EPT cannot completely replace TPN methods (Cameron et al., 2010).

**Provider use of EPT.** Three studies discussed the providers' willingness to use EPT. Hsii, Hillard, Yen, and Golden (2012) found that most of providers' reluctance to use EPT was due to a knowledge gap in how and when to use the treatment method. Cramer et al. (2013) found that there was a higher rate of usage of EPT in states where laws did not prohibit EPT; however, only 9.5 percent of patients interviewed for the study received EPT. Differences in provider specialties did not predict provider usage rates of EPT (Cameron et al., 2007). Providers were willing to try the method, but these same providers said they would prefer direct treatment of partners over EPT (Cameron et al., 2007).

**Practice guidelines.** The American College of Obstetricians and Gynecologists (ACOG), the CDC, the American Academy of Pediatrics (AAP), and the Society for Adolescent Medicine (SAM) recommend the use of EPT for the partners of patients who test positive for GC and/or CT. They recommend using EPT for heterosexual patients and their partners from the previous 60 days from the day of index patient treatment (ACOG, 2012).

### **Theory**

Protection Motivation Theory (PMT) is used to evaluate a person's health behavior as it relates to beliefs about a specific health threat and coping strategies relating to a prescribed action or treatment by the health care provider (Rogers, 1975). In a study that involves implementing EPT to a population of mostly young males and females, PMT explains the variation of health decisions in this population. PMT makes it easier for the healthcare provider to address individual fears related to vulnerability and susceptibility to CT. The use of PMT in the EBP project also assists in evaluating an individual's coping process, which involves the individual's beliefs relating to EPT's efficacy, self-efficacy using EPT, and associated costs of using EPT as a supplemental treatment for their CT infection (Maddux & Rogers, 1983).

PMT contains two major theory concepts, the threat-appraisal process and the coping-appraisal process, which are both cognitive mediating processes (Rogers, 1975). The threat-appraisal process evaluates maladaptive behavior as it relates to intrinsic and extrinsic rewards, a person's perception of the severity of a threat, and the perceived probability of the threat's occurrence (Rogers, 1975). The coping-appraisal process evaluates adaptive responses or one's ability to cope by addressing a person's response efficacy, self-efficacy, and beliefs relating to the costs involved in a chosen response (Rogers, 1975). These concepts are evaluated by the student investigator in an attempt to change a person's maladaptive response to a fear or a threat into an adaptive response, one aimed at protection motivation (Floyd et al., 2000).

PMT is a higher level theory that uses a persuasion technique by a provider to instill fear relating to a particular health threat with the intention of controlling and/or altering the response by the patient (Rogers, 1975). This middle-range theory specifically addresses health beliefs and a person's actions related to their health beliefs as well as concepts easy to operationally define

(McEwen & Wills, 2014). PMT has been validated as a reliable framework for studies on reducing alcohol consumption, smoking cessation, STI prevention, and chronic diseases. It is applicable to any study that deals with a defined health threat with an effective response or treatment that can be implemented by a person (Floyd et al., 2000).

## **Methods**

### **IRB and Site Approval**

An EBP project involving human subjects must have approval from an institutional review board (IRB; Moran, Burson, & Conrad, 2014). For this project, IRB approval was sought but the study was deemed not human research by the University of Missouri-Kansas City IRB and viewed as an evidence-based quality improvement project. The Director of Community Health Promotion at the project setting granted approval to conduct the project at the site.

### **Ethical Issues**

It is important to address ethics when researching any population, but it is especially important when dealing with vulnerable populations. According to Flaskerud and Winslow (1998), a vulnerable population is a group of people who have limited resources and in turn have increased risk factors for diseases that contribute to higher rates of morbidity and mortality. The study group at the project site is considered a vulnerable population in that they are poor, underserved, and consists of a higher percentage of ethnic minorities than the community in which it stands.

To ensure that research is ethical, individual privacy was maintained by keeping patient involvement from public view. Confidentiality was maintained by only allowing those directly involved in the project to view the documents and logs.

**Funding**

The CDC and individual states fund EPT at local health departments and STI clinics; therefore, after the three-month pilot project, funding may be sought from the CDC if state funding does not continue. Funding from the state of Missouri covered the cost of medications and materials supplied to each partner of patients that test positive for CT. The clinic supplied the testing for the CT screens for the patients and the retesting follow-up for patients and their partners, as is current practice.

**Setting and Participants**

This project took place in the STI and Women's Health clinics at the project site. Recruitment for project participants was over a three-month period based on consecutive sampling of the number of male and female patients over the age of 17 that came to the clinic for CT testing and were diagnosed with CT infection. Patients excluded were those that are non-English speaking and/or pregnant and those that are men who have sex with men. Any patient under the age of 18 was excluded as well as those with co-infections with GC (Batteiger et al., 2010). The anticipated number of CT positive patients over the three-month pilot study period was approximately 23.

**EBP Intervention**

For this evidence-based quality improvement project, each patient over the age of 17 who presents for treatment of CT after testing positive for CT in the STI or Women's Health clinics at the project clinic was offered EPT for each of their heterosexual partners in the past 60 days (American College of Obstetricians and Gynecologists, 2012; Vaidya, Johnson, Rogers, Nash, & Schillinger, 2014). These index patients were asked how many sexual partners they had within the past 60 days and were given EPT packs, including medication and printed educational

information, for up to three of their sexual partners for the treatment of CT. Each of the patients who tested positive for CT, whether accepting EPT or not, was asked to return to the clinic in three months to be re-tested for CT. Data was collected and tracked for each of these patients over this time period to assess the percentage of patients accepting EPT for their partners and the impact of EPT on recurrence rates in this population at the project site.

Patients in the first three months of EPT intervention represented the study group of index patients that were followed over the prescribed three months. A test of cure was limited to a three-month re-testing time. Therefore, the intervention began in mid-August 2018 and finished in mid-November to allow for final test of cure visits at three months post-treatment.

Each patient testing positive for CT was stored in the computer system, a secure database, at the project site. As the nurses are the staff offering EPT to the positive CT patients, they will be the staff entering the data into the system. Within the secure database, each positive patient's record was stored as well as whether they were offered EPT, whether they accepted or rejected the intervention, and if accepted, how many partners were treated. It was the responsibility of the student investigator at the project site and the nurses to maintain the record of these patients. The database tracked each patient's results at their return visit for testing at three months post-treatment. At the end of the study period, all de-identified data will be stored at the project site in their computer database, which is secure.

### **Change Process and EBP Model**

The change model chosen for this EBQI intervention is Kotter and Cohen's Model of Change (Melnyk & Fineout-Overholt, 2015). It has a succinct step-by-step plan to motivate organizational change. It consists of eight steps from the first step of conveying a sense of urgency to this EBQI project and what it would mean for the patients to the final step of

nourishing a new change culture so that the change will last. Step two is selecting a team to help organize the project and identifying people who are committed. Developing the vision for the project is step three, and the team develops this. As a team, the vision is then communicated in step four to those that will take part in the project. Empowering the staff to take part in the project is step five, and communicating interim successes is important in step six. Persistence is the key to step seven, which is necessary in an overall slow process that incorporates the entire team.

The Iowa Model of Evidence-Based Practice to Promote Quality Care (Melnyk & Fineout-Overholt, 2015) is the model that best aligns with the project. It consists of six steps. Step one is assessing the need for change or problems that *trigger* the need for clinical change and includes stakeholders in this step (Gawlinski & Rutledge, 2008). Step two looks at best evidence for the project, and then step three is critically analyzing that evidence. Step four is the working phase of the project where the design of the project is developed. Implementation of the evidence-based quality improvement project and evaluation of the pilot study is done in step five, and in step six a plan for maintaining change is developed. Implementation of the project on a long term, beyond the three-month pilot, was done at this stage as well as sharing evidence of the outcomes with stakeholders.

### **Study Design**

Because this project determines the effects of an evidence-based intervention of EPT on patient outcomes and recurrence rates in one cohort, a quasi-experimental design is necessary. Patients who meet inclusion criteria was offered EPT. Outcome data was gathered on those who accepted and did not accept the EPT intervention. At the end of the three-month pilot, patients returning for test of cure visits had their results stored in the secure database and rates of

recurrence were calculated and compared on the two groups of index patients, those accepting and those not accepted EPT.

### **Validity**

Internal validity was controlled for in this study by using the same test for each patient. This test is the nucleic acid amplification test (NAAT) on urine samples from each patient. This test is the method of choice for measuring results for CT and is an accurate, valid test. The study population was male and female patients over 17, and because the population in the STI clinic at the project site is males and females of all ages, external validity or generalizability can be assured from the findings of this project. All patients that meet inclusion criteria were offered EPT. Those patients that accepted EPT (the test group) were compared to the group that did not accept EPT (the control group) at three months for reoccurrence of infection. The comparison between the test group and the control group, although not randomly grouped, enhances the validity and therefore significance of the findings.

### **Measured Outcomes**

The percentage of patients accepting EPT in this pilot was compared to historical data, the percentage of patients accepting EPT in previous studies, to determine the program's effectiveness in terms of acceptance rates by the index patients. This measured the amount of uptake of EPT by the infected index patients which provides information about effect on recurrence rates of CT. Also, the rates of recurrence of CT at three-month follow-up visits for each patient that tested positive for infection at the initial encounter and then accepts EPT for the partners was measured in the study. The infection rates in patients accepting and not accepting EPT will be compared at the three-months visits. These measurements gave the total number of

reoccurrences of infection in the sub-group of patients accepting EPT compared to the sub-group not accepting EPT, allowing for a measurement of intervention effectiveness.

### **Measurement Instruments**

The NAAT looks for viable and non-viable organisms and can detect a single copy of DNA or RNA. Because this test is sensitive, less invasive methods for sample collection can be utilized, such as urine samples, to detect infection at the project site STI clinic. This test has a greater than 90 percent sensitivity or reliability and greater than 99 percent specificity or validity. The sensitivity and specificity are greater than other culture tests for CT. Most companies selling the test report no false positive results (Rapp, Shachter, Gaydos, & Van De Pol, 2014).

### **Quality of Data**

A post-hoc power analysis was performed to validate a sample size of approximately 23 in achieving power of 0.8, medium effect and alpha 0.05. Two benchmark RCTs explored EPT effectiveness and reducing rates of recurrence of GC and CT and found that EPT is more effective when compared to standard partner referral for treatment alone. Schillinger et al. (2003) studied only CT recurrence in 1787 women and found EPT to lower re-infection by 20 percent more than standard partner referral. Golden et al. (2005) examined 860 patients over a five-year timeframe and found EPT to be superior. Batteiger et al. (2010) found after studying 210 patients that reoccurrence of infection is more often due to re-infection but did not specifically study EPT. The limitations in the reliability of this EBP project are the short timeframe and low number of participants compared to these benchmark studies.

### **Analysis Plan**

Demographics of the population under study are males and females over the age of 17. Only those patients testing positive for CT will be included in this study. Because CCPHD

serves uninsured and underinsured patients, the demographic of the study population will come from a low socio-economic status, as well. A chi-square test will be used to determine statistical significance in the data that is collected between the sub-groups.

## **Results**

### **Setting and Participants**

Staff in the STI and Women's Health clinics, consisting of one epidemiologist and three registered nurses, received ongoing education regarding the program from the time of project approval in June 2018 throughout the implementation phase, which ended in mid-November. By the end of that three-month time frame, 163 patients were seen, 25 patients were CT positive, 14 patients were offered EPT, and 8 patients accepted EPT.

### **Intervention Course, Actual**

Starting in mid-August, the intervention began with the identification of positive CT cases by the laboratory findings from the project site lab staff and notification of clinic staff within the population of STI screening cases done in the two clinics, Women's Health and STI. Once positive CT cases were identified, patients were notified over phone and asked to return to the clinic for education and treatment of infection, as has been done traditionally at the clinics. Nursing staff educated the index patients about their infections and the need for partner treatment. Partner treatment education included not only the need for partner notification but need for treatment, which included EPT. From mid-August to mid-November, the positive CT index cases were educated and offered EPT for up to three of their sexual contacts within the past 60 days. During education with the index patients, the clinic nurses would inform them of the need to return to the clinic at three months post-treatment to test for cure. Index patients were notified of the necessary return to clinic at the time of their diagnosis and treatment and

were phoned for appointments for those visits. The data for the three-month follow-up is ongoing up to the final three-month test of cure visit, which is due in mid-February.

Within the program implementation time frame of mid-August to mid-November, there were a total of 163 patients seen within the two clinics, 108 in the STI clinic and 55 in the Women's Health clinic. The breakdown of female to male of the 163 patients was 97 to 66, respectively. Interestingly, there were more males presenting to the STI clinic than females at a rate of 60 to 48. Within the Women's Health clinic, the male to female ratio was 6 to 49. By the end of the three-month period, there were 14 patients offered EPT, four of which were male, and eight total patients accepted EPT, with one being male.

### **Outcome Data by Subtopic**

The desired outcome from this evidence-based quality improvement project was to reduce rates of recurrence of CT infection by initially implementing a program that has shown in prior studies to reduce rates of recurrence. Therefore, the required initial measured outcome of importance was the uptake of that intervention. That outcome was easily measured by the amount of patients seen in the clinics that tested positive and accepted the EPT intervention. The percentage of index patients accepting EPT compared to historical data will show the possible effects that EPT will have on the recurrence rates.

There were 163 patients that presented to both clinics for STI screening over the three-month period. Within the 163 patients, 25 patients tested positive for CT, but only 14 of the 25 that tested positive were positive only for CT and 11 were positive for other infections concurrently. Those 11 cases were excluded from participation in the project. Out of the 14 positive cases of CT, eight patients accepted EPT. Two of those eight patients accepted two packets of EPT due to contact with multiple partners. The percentage of patients accepting EPT

that were offered EPT by program inclusion criteria was 57%. Those index patients not accepting EPT voiced reasons for not accepting the method to include “I already told my partner,” “they have an appointment for treatment already,” “they are here with me today,” and “they want to go to their own doctor” (personal communication, November 16, 2018).

By mid-February, the three-month test of cure visits will be concluded, and data will exist to analyze the percentage of recurrence in the population of 8 index patients that accepted EPT compared to the remaining 6 positive CT cases that did not accept the intervention. This data is currently not available for analysis. However, the purpose of this project was to implement EPT as an effective treatment modality for CT. The 57% acceptance rate shows that patients are likely to accept the intervention as compared to the historical data, an acceptance rate between 50 and 55 percent, making it an effective intervention at the project site.

## **Discussion**

### **Successes, Most Important**

Success in this evidence-based quality improvement program is evident in the percentage of patients that were accepting of EPT. Prior to program implementation, it was uncertain how receptive the index patients would be towards a new intervention for treating CT. However, the high percentage of patients willing to try a new treatment modality helps one to see the success of this program at the project site. Patients were also verbally positive in their responses to the nurses who offered them EPT (personal communication, November 16, 2018). Also, the nurses and staff liked being able to offer EPT to the patients and were certain they would continue offering EPT after the three-month pilot program (personal communication, November 16, 2018).

### **Study Strengths**

“It is clear cut that the people really need it,” stated one registered nurse at the project site (personal communication, November 16, 2018). From initial contact with the staff at the project site, it was evident that they supported offering EPT to the positive CT patients, and they continued to advocate for the intervention even after three months of offering it to their patients. Because the nurses are the initial point of contact with medical staff for the patient, it is important to have buy-in from them so that longevity of the program is ensured.

The nurses run the STI clinic by utilizing protocols for testing and treatment, so it was extremely important that they agree with the need for this program and that they saw the success with the patients who were willing to be educated and accepting of EPT. The nurses were satisfied with the outcome of the pilot project and asked questions about including GC treatment into the EPT protocol. They will be the team advocating for the continued use at the clinics to the leadership team, which has been supportive of EPT use from the onset. With measured success and support from staff, leadership should remain content with the use of EPT.

### **Results Compared to Evidence in the Literature**

Fifty-seven percent of the patients educated on EPT and the effectiveness accepted the intervention in the STI and Women’s clinics at the project site. Historically, the rate of acceptance of EPT ranged from 50 to 54.9% (Mickiewicz, Al-Tayyib, Thrun, & Rietmeijer, 2012; Vaidya, Johnson, Rogers, Nash, & Schillinger, 2014). Compared to the historical data that exists on rates of acceptance, EPT was accepted at a 2% higher rate in the number of patients that were seen in the STI and Women’s Health clinics at CCPHD.

Althaus et al. (2014) in their compilation of systematic reviews of randomized control trials, analysis of clinical audits, and qualitative studies dealing with quality of life, found that evidence supports the effectiveness of EPT in reducing index case reinfections. The American

College of Obstetricians and Gynecologists (2018) along with the CDC (2018) support the continued use of EPT due to the effectiveness at reducing rates of CT. With research supporting EPT effectiveness along with a 57% acceptance rate in the STI and Women's Health clinics at the project site, there is evidence to support that EPT is desired and will be effective in these clinics to reduce rates of CT incidence and recurrence.

### **Limitations**

#### **Internal Validity Effects**

It is uncertain if any patients that were presumptively treated for CT at the time of their initial screening visit were offered EPT at a later visit with staff. This would lower the number of patients offered EPT compared to the number of patients that tested positive and then were called back to clinic for treatment. Also, it is unknown if index patients at the time of their follow-up appointments where they were given results, medications and EPT, were symptomatic of infection. There is no record of this information. Symptoms whether present or not at the time of diagnosis may have had an impact on whether index patients accepted or did not accept EPT.

Another factor that could limit the internal validity of the data is whether index patients accepting EPT delivered it to their partners and if their partners accepted and then took EPT. It is unknown whether this was accomplished by each index patient. At the three-month test of cure visits to be completed, this data can be obtained.

The ability of the staff to chart data collected on the index patients may be hindered because the information is not directly within the electronic medical record. This could prevent the nursing staff from charting on the patient at the time of the encounter, thereby possibly causing information to be inadvertently omitted in charting. Methods to include this data in the

actual electronic medical record for the patient, making it more efficient, may help in the future as the project site continues to utilize EPT.

### **External Validity Effects**

It is the intention of the student investigator to use data analysis from this program in Clay County, Missouri, to validate potential success of use at another local public health clinic, which is located in bordering Jackson County and has an STI clinic desiring EPT program implementation. However, the percentage of African Americans that presented for testing and treatment at the current project site is only 14% compared to the percentage at the prospective project site which is much higher at 69%. This could affect the generalizability of the study data to the population at the new project site, which is the original intent. Also, Clay County has a lower percentage of African Americans in its community at 7% compared to Jackson County which has 24%. The percentage of those living in poverty in Clay County and Jackson County are 8% and 16%, respectively. Because demographics are different in these two populations, it may be difficult to generalize the findings from the population at the current project site in Clay County to the STI clinic population at prospective clinic site in Jackson County.

### **Sustainability of Effects and Plans to Maintain Effects**

It will be important to place study data within each index patient's electronic record, which makes it easier for the staff to chart and for epidemiology to collect their data for program analysis. If this is not accomplished, eventually staff and those in leadership may not be able to assess and determine that EPT is still effective in the patient population in the various clinics at the project site. Data analysis is simplified if content can be easily accessed in the electronic record.

It is possible that if there are less exclusion criteria that the staff may see the simplicity of continuing the program. For instance, if those with co-infections with GC could be included, then more patients could be treated and there would be less parameters involved in implementing the program, making it easier to follow the protocol and be more inclusive.

### **Efforts to Minimize the Study Limitations**

Possible limitation on program participation from those without symptoms at the time of notification of infection, could be reduced by further education about the effects of recurrent infection on the index patient's health and future fertility at the time of diagnosis and contact with medical staff. The limitation of not knowing whether the index patient's partners took EPT when offered can be alleviated by simply asking at follow-up visits if this was accomplished, which would be easier to accomplish if the electronic record was in place to alert the staff of the necessary questions at each visit. Developing the EMR for collection of pertinent data would improve this limitation.

## **Interpretation**

### **Expected and Actual Outcomes**

It was anticipated that there would be fewer positive cases of CT than were actually encountered at the site. On average, there were 23 cases per three-month period in 2017, and in the three-month time frame for this study it was 25. It was assumed that more female patients would present for screening in the STI clinic based on data from Vaidya, Johnson, Rogers, Nash, and Schillinger (2014), but out of the 417 patients presenting to the STI clinic at the project site from January to November 2018, 218 were male and 209 were female (personal communication, November 29, 2018). The percentage of patients accepting EPT at the clinic site over the three

months was 57%, which was slightly more than expected from previous studies (Mickiewicz, Al-Tayyib, Thrun, & Rietmeijer, 2012; Vaidya, Johnson, Rogers, Nash, & Schillinger, 2014).

### **Intervention Effectiveness**

Buy-in from clinic staff was evident from the start of discussions regarding implementation of the study with clinic leadership and nursing staff. Before approaching the staff about the evidence-based quality improvement project on EPT, the nursing staff had inquired about starting a program in the past and was enthusiastic about trying a new program that they heard could help patients. The program had support from staff which facilitated the efficiency and effectiveness of program implementation and evaluation and the index patient EPT acceptance rate of 57%.

Program effectiveness will only be evident in a setting that has similar medical staff buy-in and response to implementing evidence-based quality improvement programs. In a setting where there are larger numbers of index patients, it is important to have adequate amount of staff to provide the patient education and program implementation. With adequate staffing, effectiveness on a larger scale could be obtained and possibly achieve higher index patient acceptance rates and greater effects on recurrence rates.

### **Intervention Revision**

Having a more detailed and inclusive electronic record will enhance data collection and analysis and improve attainment of outcomes. It would ease the burden on medical staff regarding excess time spent charting on each patient.

### **Expected and Actual Impact to Health**

An expected impact of this evidence-based quality improvement program was that individual index patients would have less reoccurrence of CT infection as partners are treated in a timely, efficient and effective manner. Patients may be satisfied with their health care if they receive care that is up-to-date and effective, beyond initial infection treatment, and addresses prevention. By decreasing rates of recurrence, disease cases would decrease in the clinic with eventual impact experienced beyond the clinic to the community of Clay County. Initial cost to the health care system increases as cases are treated instead of untreated; however, the cost of care globally decreases as sequelae of untreated infections is alleviated. Also, as success of EPT programs are realized, policies and laws that are less restricting on EPT use will need to be developed.

### **System, Costs, and Policy**

Estimated treatment cost per case of CT is \$11. Index patient treatment is not included as a part of this program as the focus is only on partner treatment with EPT. It was estimated that 22 positive CT cases would present with the option for EPT and that half of those cases would accept it for at least one partner. That would equate to an estimated cost for the program over a three-month period of \$242. The actual number of EPT packets handed out came to 10, which meant that the actual cost for running the program was \$110 over three months.

Currently, funding for this program is provided by the state of Missouri through their program for partner treatment of GC and CT. They provide free treatment for partners of index patients testing positive for infection when they present to clinics for treatment. Therefore, there is no need to seek further funding for continuation of this program, which is in Clay County, Missouri.

With success of this program witnessed by clinic staff and administration at the project site, there has been consideration of including treatment for GC in the EPT program. Currently, GC is treated with the same drug as CT, which is 1 gram of azithromycin, plus 250 mg of ceftriaxone intramuscularly. This is prohibitive in an EPT program, as an injectable medication cannot be sent home with the patient; however, there is an oral medication that is less effective but recommended for treatment of GC in EPT programs (CDC, 2012). In the case of EPT for index patients with GC, they would be sent home with EPT packets containing 1gm of oral azithromycin and 400 mg of oral cefixime, which costs approximately \$9 per pill. Therefore, treating a partner of an index patient positive for GC with EPT, would cost approximately \$20 per packet.

### **Opportunities**

Medical staff and epidemiologists at the prospective program site in Jackson County, Missouri, have been preparing for implementation of an EPT program. With the data from the current program site, the project leaders in Jackson County have evidence that their clinic can be successful with a similar program. The new program site is starting EPT implementation in January 2019.

### **Conclusion**

#### **Practical Usefulness of Intervention**

Through this evidence-based practice pilot project, it was evaluated if EPT is an effective method to notify and treat partners and reduce rates of recurrence compared to TPN methods at CCPHD. The cost of screening and treating patients and their partners empirically was found in studies to save on health care dollars due to decreased recurrence rates and sequelae from

infections using EPT. The use of EPT is an efficient, effective and patient accepted way to fulfill the primary goal of reducing rates of recurrence of CT.

### **Further Study or Implementation of Intervention**

Medical staff and administration at the project site have determined to continue the use of EPT for the positive CT patients according to the established protocol as written for this EBQI pilot program. There is some consideration for the addition of treatment for GC as part of the EPT program, depending on cost and approval by the state of Missouri as the funding source. If necessary, additional funding will be sought in order to add GC as part of the program. Grant writers at the project site would need to explore funding.

### **Dissemination**

After statistical analysis of the data is completed after the three-month test of cure visit results are obtained, the outcome of this evidence-based quality improvement project will be shared with the staff at the clinic project site. Once approved by staff including the epidemiologist, EPT will be used indefinitely at the clinic making it possible to reach more patients that are positive and their partners and causing a greater effect on the health of the clinic patients. The results of this evidence-based quality improvement project will be shared with other local clinics for greater impact on the health of the city and surrounding communities. Results of this project will also be shared via a poster presentation at a conference in March 2019 for the Midwest Nursing Research Society.

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*Appendix A*

## Budget Table

<b><u>Type of Infection</u></b>	<b><u>Weekly Avg # of Cases</u></b>	<b><u>Cost per Case</u></b>	<b><u>Weekly Cost</u></b>	<b><u>Three Month Cost</u></b>
<b>Chlamydia</b>	2 *	\$11	\$22	\$275
<b>Total Direct Cost of the Program</b>				\$275

\*This is the estimated number of weekly cases if all positive index patients accepted EPT for one partner

*Appendix B*

## Definition of Terms

<b>Terms</b>	<b>Definition</b>
Chlamydia	Sexually transmitted bacterial infection
Gonorrhea	Sexually transmitted bacterial infection
Expedited partner therapy	A clinical practice of treating partners of patients who test positive for infections without that partner being evaluated by a medical provider
Index patient	A patient with an instance of a disease that is discovered first which leads to the discovery of others
Partner referral or Traditional partner notification	Patients who test positive for infection refer their partners to a medical provider for treatment of possible exposure to that infection

## Appendix C

## Synthesis of Evidence Table

First author, Year, Title, Journal	Purpose	Research Design <sup>1</sup> , Evidence Level <sup>2</sup> & Variables	Sample & Sampling, Setting	Measures & Reliability (if reported)	Results & Analysis Used	Limitations & Usefulness
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## Effectiveness of EPT

Althaus, C.L. (2014). Effectiveness and cost-effectiveness of traditional and new partner notification technologies for curable sexually transmitted infections: observational study, systematic reviews and mathematical modelling. National Institute for Health Research	Studies the effectiveness and cost-effectiveness of traditional and new partner notification for curable STIs	62 page Compilation of systematic reviews of RCTs, analysis of clinical audits, qualitative studies dealing with quality of life. Level 1	General population and genitourinary clinic pts in the UK spanning from 1966 to 2012	Population prevalence, index case reinfection, and partners treated per index case. 95% CI shows significance of EPT over standard partner notification	Evidence supports effectiveness of EPT in reducing index case reinfections.	Outcome on chlamydia evidence is limited Need further research related to quality of life issues
Azariah, S. (2012). Partner notification for sexually transmitted infections. Why can't we talk about it? The New Zealand Medical Journal	Discussed partner notifications methods	Review of several qualitative studies, Level 5			Did not note that EPT was effective at reducing recurrence of CT	Appeared to have bias towards TPN and noted the inability to assess the partner for co-infections and for counseling.  Noted that w/ EPT there is less f/u
Kretzschmar, M. (2012). Effects of screening and partner	Compares increased screening and partner notification	Systematic review of a qualitative study. Level 5	Data collected from 1988 to 2009 looking at CT positivity	Increased screening coverage over the	Increased rates of partner notification and	Large variations in screening coverage by

notification on chlamydia positivity in the United States: A Modeling Study. Sexually Transmitted Diseases	methods on CT rates of reinfection			period of the study	treatment impacts rates of CT greater than just screening alone	region in the US.
Kissinger, P. (2011). Expedited partner treatment for sexually transmitted infections: an update. Current Infectious Disease Reports	Reviews evidence for EPT, current policies, cost effectiveness, limitations of current research on EPT, availability and uptake of EPT	Systematic review of qualitative and quantitative studies. Level 5	7 RCTs were reviewed along with other qualitative studies		EPT may be more effective for men than women and less effective for younger people with more partners	High rate of repeat infections and EPT acceptance rates being low suggests more research needs to be done.
Batteiger, B.E. (2010). Repeated chlamydia trachomatis genital infections in adolescent women. Journal of Infectious Diseases	Looked at reinfection v. treatment failure in females with CT	Longitudinal observational study, Level 6	386 Females 14-17 years old in Indianapolis at 3 primary care sites were studied between 1999 to 2005		Note that reinfection with CT is more prevalent at f/u than treatment failure	Implications for partner notification methods but was not studied
Heijne, J. (2010). The role of reinfection and partner notification in the efficacy of chlamydia screening programs. Journal of Infectious Diseases	Looks at length of partnership, screening for CT and reinfections rates	Cohort study Level 4	Over a 5-year period implemented screening and partner notification In Switzerland		Partnerships should be incorporated explicitly in mathematical models that assume that partner notification is part of a strategy for controlling CT transmission. Partner notification increases the impact of the intervention in the pair	Weaker impact of screening when compared directly with a model that does not accommodate partnerships. Age structure not included. Did not consider persistent infection and assumed 100% treatment efficacy.

					model that allows for reinfection	
Shiely, F. (2010). Expedited partner therapy: A robust intervention. Sexually Transmitted Diseases	Used the data from 2005 RCT to identify subsets of patients based on characteristics : 1.STI at baseline 2.Gender 3.Age 4.Race 5.Diagnosis site 6.Symptoms 7.Partner type 8.Belief partner has other partners 9.Belief that pt will not have sex w/ >1 partner  To evaluate EPT across subgroups	Systematic review of an RCT, Level 1	1860 pts randomly assigned to EPT or SPR were analyzed by subgroups and their infection w/ GC and/or CT at f/u	Both randomized groups were similar in their characteristics	10% of EPT pts had infection at f/u compared to 13% of SPR. Those at higher risk were Hispanics, dx in ED, Planned Parenthood or public health clinic and those that stated they were unsure whether they were planning to have multiple partners again. EPT pts reported were significantly more likely to be neg at f/u and state their partners were treated. EPT was more effective than SPR across all subgroups	EPT did not increase partner treatment with pts that noted to have one-time partners. Other methods for treatment of this subgroup would need to be explored. Only one small county was used in this study. Need a broader range in the next population studied. Reliability of the information relayed by the index pt to the researcher could be in question.
Cameron, S.T. (2009). Novel interventions to reduce re-infection in women with chlamydia: a randomized control trial. Human Reproduction	Compared postal testing kits and EPT to TPN in reducing rates of re-infection in CT	Quantitative, RCT, Level 2	330 women (ages 16-45) with CT were randomized to receive one of 3 partner strategies. Only 215 completed the study by posting at least on urine sample for testing w/in	Results obtained w/ CI of 95%	The study did not show a statistical significance between any of the study groups but stated that because of cost that EPT may be preferred over the other options	Funding for postal testing kits could be difficult to ascertain and is less cost effective Size of study was small

			the 12mth time period of the study. Done in the UK.			
Hosenfeld, C.B. (2009). Repeat infection with chlamydia and gonorrhea among females: A systematic review of literature	Looked at GC and CT re-infection rates in order to determine best practice for retesting	Systematic review of RCTs and qualitative studies, Level 1	47 studies were reviewed. All looked at CT reinfection rates. Done in the US		Determined that retesting at 3 and 6 mth intervals after initial infection is best practice. Younger age and females had higher reinfection rates. Only had one study that was an RCT that showed decreased CT and 2 RCTs that showed decrease in GC	Differences in study designs, length of follow-up and definition of outcomes made reinfection rates difficult to predict. Some studies possibly underestimated reinfection rates of CT
Hogben, M. (2007). Partner notification for sexually transmitted diseases. Clinical Infectious Diseases	Compares 4 methods of partner notification: patient referral, internet partner notification, network methods, and EPT	Systematic review of both qualitative and quantitative research studies. Level 1	1999-2005. International and national studies on 4 types of partner notification		Confines provider referral for treatment to syphilis, gonorrhea and HIV. In partners who are unwilling or unlikely to bring partner back for treatment, EPT is a reliable option for partner treatment and reduction in index case reinfection	Recognizes that in EPT partners may avoid evaluation since they've been treated, which misses possible co-morbidities. In MSM, HIV could be missed and in adolescents trichomoniasis could be missed
CDC. (2006). Expedited partner therapy in	Compares current practice to EPT. Guidelines on	Meta-analysis of 4 RCTs and practice	US studies. Data from 1996-2000, 1998-2003, 2001-2004,		All studies showed clinical significance for the use of	Evidence in these studies is limited to only heterosexual

the management of sexually transmitted diseases.	the use of EPT	guidelines. Level 1	2001-2004. Only heterosexual male and female patients were studied who had either/or GC, CT or trichomoniasis		EPT in cases of GC and CT in heterosexuals	females and males, not MSM, pregnant women or adolescents
Golden, M.R. (2005). Effect of expedited treatment of sex partners on recurrent or persistent gonorrhea or chlamydial infection. The New England Journal of Medicine	Compared EPT to standard partner referral (SPR)	Quantitative, RCT, Level 2	2751 pts with GC and/or CT from 541 providers in King County, WA, USA, from 1998-2003. Only 1860 completed the study	Within 14 days of treatment index patient was contacted by mail or phone and randomized to EPT or SPR	Infection at f/u was greater with SPR, younger age of pt, CT infection alone, and those w/ combined GC/CT infection. Significant reduction in GC/CT at f/u w/ EPT P=0.05	Sample size large enough to make results generalizable; however, missed opportunity to treat other infections of partners and counsel regarding safer sex practices
Schillinger, J. A. (2003). Patient-delivered partner treatment with azithromycin to prevent repeated chlamydia trachomatis infection among women. Sexually Transmitted Diseases	To determine whether repeated infections with CT can be reduced by EPT	Quantitative, RCT, Level 2	1787 women 14 to 34 years of age with CT randomized to EPT or self-referral of partners.	4 months after index partner treatment they returned for test of cure. Using a 95% CI, OR of 0.80.	Risk of reinfection in EPT group was 20% lower than the self-referral group. Women in the EPT group reported high compliance with the intervention	Large number lost to follow up after enrollment. There was a limited power to detect a difference between the two study arms.

#### Index Patient Acceptance of EPT

Buchsbaum, A. (2014). Sexually transmitted disease partner notification among African-	To better understand preferences and practices regarding partner notification of STI among	Qualitative study. Level 4	46 adolescent AA females from a Title X, urban family	Patients had to all be: female, English speaking, born in the US, 14-19 yrs of age,	STI at baseline 26.7% and after 3mths was 23.9%, which is consistent	Low enrollment. Out of 93 pts that tested positive 47 did not finish the study.
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<p>American, adolescent women. Infectious Diseases in Obstetrics and Gynecology</p>	<p>female, AA adolescents</p>		<p>planning clinic in the southern US. From April 2012 to September 2012</p>	<p>sexually active with male partner, AA Questionnaire provided to pts with questions on preferences for partner notification and treatment and self-efficacy regarding partner notification. Pts testing + for GC or CT were asked to return in 3mths for retesting and given an additional questionnaire</p>	<p>with other studies Pts did not indicate a preference for EPT but most said they would use it if it was provided to them for their partners. Most preferred to bring their partners to the clinic over EPT or patient referral</p>	<p>Another limitation was the study reliance on self-reported data.</p>
<p>Vaidya, S. (2014). Predictors of index patient acceptance of expedited partner therapy for chlamydia trachomatis infection and reasons for refusal, sexually transmitted disease clinics, New York City, 2011 to 2012. Sexually Transmitted Diseases</p>	<p>Examined associations between accepting EPT and patient and clinic-level characteristics</p>	<p>Qualitative study. Level 5. EMR review of retrospective data</p>	<p>9 STD clinics in NYC. 6590 cases of CT between July 2011 and October 2012 with only 2066 eligible to receive EPT and only 1964 included in the study.</p>	<p>Index patient with only +CT and no concurrent infections could get EPT. Only pts testing pos for CT were eligible for EPT.  Patients declining EPT were asked why and given a list of 8 reasons. 95% CI's used with p values &lt;0.10</p>	<p>99.4% of the 2066 eligible patients were offered EPT. EPT acceptance rate was 54.9%.  Multivariable analysis was used to predict acceptance of EPT that was offered. Most positive predictors of acceptance were pt having symptoms at time of diagnosis and having a male provider and were less likely to accept if their partner was in the clinic that day or if their</p>	<p>Levels of EPT acceptance could be lower since acceptance increased in index pts who had symptoms at time of diagnosis.  No way to validate pt's claim that partner was treated in clinic EMR did not capture type of relationship of pt to partner (casual v. steady) which may be associated with a change in acceptance Only done in STD clinic so</p>

					primary language was not English	may not be generalizable to other settings.
Mickiewicz, T. (2012). Implementation and effectiveness of an expedited partner therapy program in an urban clinic. Sexually Transmitted Diseases	Studies the acceptance rate of EPT among heterosexual men and women in a clinic that offers it for GC and CT	Cohort Study Level 4	From November, 2006 to April, 2011 at Denver Metro Health Clinic 2578 were eligible for EPT but only 351 pts returned for follow-up checks for reinfection	Percentage of index patient acceptance of EPT and reinfection rates. 95% CI used	With EPT there is a reduced risk of CT and GC reinfections but the data is not statistically significant. However, once computer documentation and chart review was evaluated and done correctly acceptance rates increased to 50%. Also found that as the number of clinic visits increased so did the acceptance rates.	EPT acceptance noted to be affected by partners already being treated or being treated concurrently. Those pts with more than 1 visit may have affected the standard errors and tests of significance. Unable to validate the true number of sex partners. No information on those that did not return for retesting. Since this is not an RCT the reduction in reinfections among those accepting EPT may be caused by factors other than partner treatment.

**Partner Acceptance of EPT**

Cameron, S.T. (2010). Expedited partner therapy for chlamydia trachomatis at the community pharmacy. BJOG	Pharmacy vouchers given to index pt to give to partners for free treatment at select pharmacies. Main outcome	Qualitative study, Level 6, 18 month study	90 pharmacies participated in NHS Pharmacy Direct. 5 health care sites in Lothian, Scotland participated. Only pts with uncomplicated	Number of vouchers redeemed and date as well as what pharmacies were attended were noted. 1 month after voucher was given, index	577 vouchers issued. 231 vouchers were redeemed. Time to voucher redemption median of 2 days after issue. 60 out of 67 index patients responded and	Missed opportunity to test partners for other STIs. Not all index patients offered vouchers accepted them. EPT cannot completely replace SPR or patient referral.
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	was to determine what percentage of partners actually redeemed their vouchers. Secondary outcome to determine level of satisfaction w/ the voucher scheme		infection were selected. Between May 2008 and June 2009.	pt was phoned regarding satisfaction with the program.	77% were 'very satisfied' with the voucher program.  Result was 40% of partners redeemed vouchers, which was statistically high proportion.	
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**Provider Use of EPT**

Cramer, R. (2013). The legal aspects of expedited partner therapy practice: Do state laws and policies really matter?	Evaluates policies on EPT use	Qualitative retrospective study, Level 6	Used 12 sites in the STD Surveillance Network in 2010.  2,564 pts with GC were interviewed	Variables significant at $p < .10$ in bivariate analyses were included in a logistic regression model	Only 9.5% of interviewed pts received EPT which was higher in states where laws did not prohibit its use.  Where laws authorizing its use exists, EPT had a high rate of usage	Might not be generalizable to the entire US  Response rate was low  Did not assess EPT for CT patients
Hsii, A. (2012). Pediatric residents' knowledge, use, and comfort with expedited partner therapy for STIs. Pediatrics	Looks at pediatric residents' knowledge, practices and comfort of providing EPT	Qualitative study, Level 5	289 pediatric residents from 14 California programs given online anonymous 57-item questionnaires	Emails sent to program directors. X2 analyses were used for categorical variables. Analysis of variance was used for continuous variables, and Kruskal-Wallis test was used for ordinal variables. t-test was used for	CA pediatric residents have knowledge gaps and discomfort providing EPT. Presence of a medicine fellowship decreases the knowledge and increases the comfort with using EPT.	Selection bias – only 41% of targeted population responded. Also, only 14 of the 17 pediatric programs responded. Responder bias – residents who were interested in the topic were possibly more likely to participate. Recall bias – data

				continuous variables and the Wilcoxon rank-sum test for ordinal variables for those residents that participated in an adolescent medicine fellowship.		collected from self-reported surveys. May need to alter the way residency programs teach about EPT.
Cameron, S.T. (2007). Willingness of gynaecologists, doctors in family planning, GPs, practice nurses and pharmacists to adopt novel interventions for treating sexual partners of women with chlamydia	Looks at willingness of providers to treat partners	Qualitative study, Level 6	211 doctors, 73 APRNs, and 50 pharmacists returned questionnaires. In Scotland		No difference in provider specialty was seen when looking at preference for method of partner treatment/notification  However, physicians preferred direct treatment over EPT but stated they would use EPT Overall, providers were willing to try new methods to care for patient's partners	Study may not predict the overall view of providers of all specialties

**Practice Guidelines**

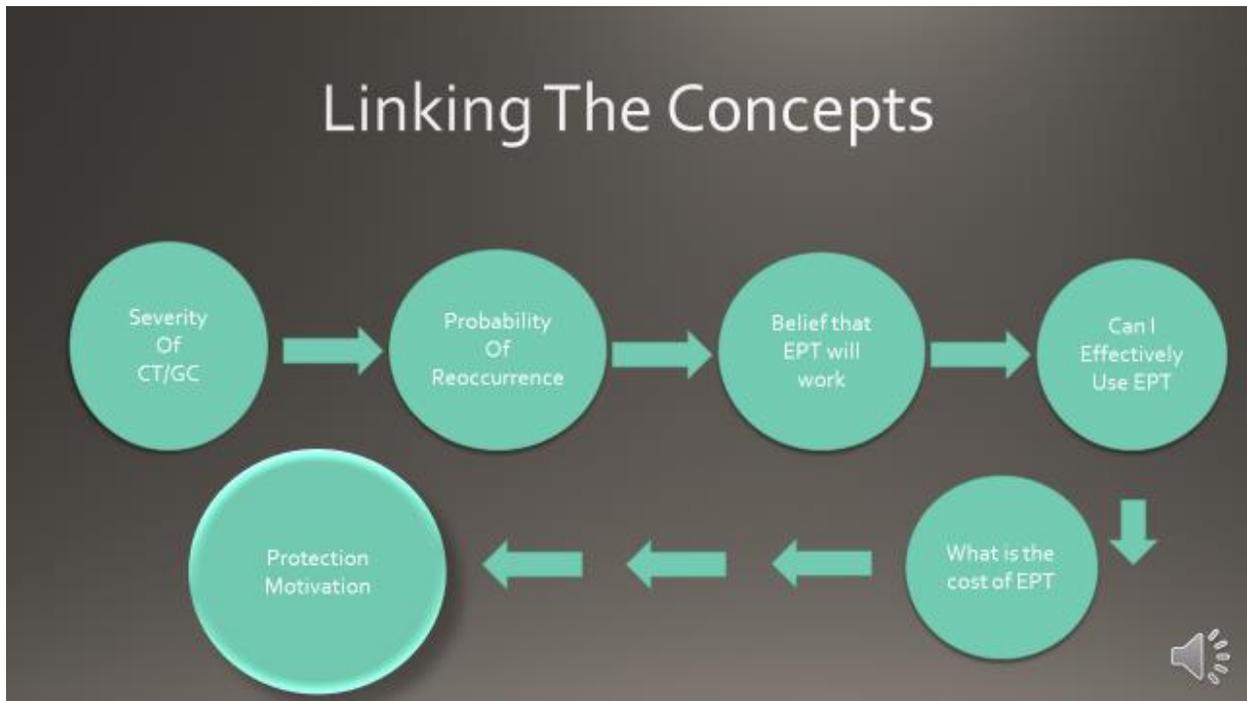
Clabon, A. (2014). STI treatment protocol at Myrtle Hilliard Davis Comprehensive Health Centers, Inc.	Protocol for STI treatment aimed at reducing the incidence of CT and GC in St. Louis City and surrounding area	Clinic Protocol Level 7			Pt with positive test results for GC and/or CT will be given a yellow card to refer partner(s) for treatment. This card will be brought to the health center for partner treatment	No treatment provided to partners who do not present to clinic or present without the yellow card.
Introcaso, C.E. (2013). Expedited partner therapy in federally	To assess entity and site policies and practices of	Qualitative study, Level 6.	29 FQHCs in NYC were surveyed in 2012	Surveys were given to medical directors at the entity	22 entities responded to the survey. 55% have a written EPT	FQHC's in NYC depart from current CDC and NYS guidelines:

<p>qualified health centers-New York City, 2012</p>	<p>EPT for chlamydial infections and other STD management issues</p>			<p>level and to the providers at the sites Surveys asked different questions of the medical directors and the providers (one at each site)</p>	<p>policy. Of those that did not, they reported that since it was not against the law that they did not need a policy. 96% of the entities use EPT. 92% said EPT is encouraged.</p>	<p>Give EPT to male pts w/ male partners NYS law requires education materials to accompany EPT and 32% did not do so Not much evidence exists regarding effectiveness of EPT through patient-delivered prescriptions requiring payment</p>
<p>The American College of Obstetricians and Gynecologists. (2011). Committee Opinion: Expedited partner therapy in the management of gonorrhea and chlamydia by obstetrician-gynecologists. Obstetrics &amp; Gynecology</p>	<p>ACOG Committee Opinion on the use EPT to prevent index patient reinfection with CT or GC</p>	<p>Opinion based on endorsement from AMA, Society for Adolescent Health and Medicine, AAP, ABA, and the CDC, Level 7</p>			<p>Recommends use for: Heterosexual partners from previous 2mths CDC guidelines to be used when choosing meds EPT should be accompanied by counseling of index pt and written instructions for partners Med or prescription can be given directly to index pt  Instruct pt to abstain for 7 days following treatment</p>	<p>Barriers to its use: Legal barriers in 23 states. Providers may not feel comfortable with EPT d/t missed opportunity to detect other STDs including HIV Provider worry over medical-legal ramifications over prescribing EPT to pt they have not assessed Concerned about lack of being able to bill for services.</p>
<p>Society for Adolescent Medicine Board of Directors. (2009). Expedited</p>	<p>Position statement by the Society for Adolescent Medicine (SAM) and</p>	<p>Opinion and endorsement by SAM and AAP, Level 7</p>			<p>SAM and AAP recommend to use EPT as an option for STI care among CT and GC +</p>	<p>Note barriers to using EPT. Legal concerns, administrative cost issues and missed</p>

<p>partner therapy for adolescents diagnosed with chlamydia or gonorrhea: a position paper of the Society for Adolescent Medicine</p>	<p>American Academy of Pediatrics (AAP)</p>				<p>heterosexual males and females who are unlikely or unable to otherwise receive treatment</p>	<p>opportunities for partner counseling and complete STI evaluation of those partners.</p>
<p>Bauer, H.M. (2008). California guidelines for expedited partner therapy for chlamydia trachomatis and Neisseria gonorrhoeae</p>	<p>Guidelines for EPT. Looks at barriers to partner notification and best practice</p>	<p>Level 7, but includes information from CDC</p>			<p>EPT most appropriate for those unwilling to seek treatment. Patients should be asked about partner symptom status, other infections, medications and possible allergies In CA can use EPT regardless of gender or sexual orientation; however, discourage use in MSM. Treat all partners w/in the past 60 days. Preferred method is to dispense med instead of prescription</p>	

Appendix D

Diagram of the EBP Study Using Protection Motivation Theory



Appendix E  
Logic Model

Inputs	Interventions <i>Activities</i>	Outputs <i>Participation</i>	Outcomes		
			<i>Short</i>	<i>Medium</i>	<i>Long</i>
<p><b><u>Evidence, sub-topics</u></b></p> <ol style="list-style-type: none"> <li>1.Effectiveness of EPT</li> <li>2.Index patient acceptance of EPT</li> <li>3.Partner acceptance of EPT</li> <li>4.Provider use of EPT</li> <li>5.Practice guidelines</li> </ol> <p><b><u>Major Facilitators or Contributors</u></b></p> <ol style="list-style-type: none"> <li>1.Grant writers</li> <li>2.Administration – Clinic Director</li> <li>3.Clinic staff</li> </ol> <p><b><u>Major Barriers or Challenges</u></b></p> <ol style="list-style-type: none"> <li>1.Support staff resistance to change</li> <li>2.Funding for the program</li> </ol>	<p><b><u>EBP intervention which is supported by the evidence in the Input column</u></b></p> <p>All patients over the age of 17 that test positive for chlamydia (CT) will be offered EPT at time of diagnosis</p> <p><b><u>Major steps of the intervention</u></b></p> <ol style="list-style-type: none"> <li>1.Educate staff and providers about the project</li> <li>2.Produce EPT packs containing – medications, literature on side effects and contraindications, advice on where partners can seek further testing, if desired, and appropriate times for follow up</li> </ol>	<p><b><u>The participants</u></b></p> <p>Patients over the age of 17 who test positive for chlamydia</p> <p><b><u>Site</u></b> Public health STI and Women’s Health clinic</p> <p><b><u>Time Frame</u></b> Six months</p> <p><b><u>Consent Needed or other</u></b></p> <p>Each individual must consent as well as the Medical Director</p> <p><b><u>Person(s) collecting data</u></b></p> <p>Sherri Sellers, MSN, WHNP-BC</p> <p><b><u>Others directly involved</u></b> Epidemiologists, MA’s and LPN’s, and pharmacy</p>	<p><b><u>Outcome(s) to be measured with valid &amp; reliable tool(s)</u></b></p> <p>Using nucleic acid amplification tests (NAAT) from urine samples:</p> <p>Number of CT cases prior to the program compared to after program implementation</p> <p>Patients’ belief that partners took EPT will be measured at their three-month test of cure visits</p>	<p><b><u>Outcomes to be measured</u></b></p> <p>Continue testing urine samples using NAAT for CT</p> <p>Monitor re-infection rates for CT at 3 months</p>	<p><b><u>Outcomes that are potentials</u></b></p> <ol style="list-style-type: none"> <li>1.Continue to see a decline in cases of CT in Kansas City</li> <li>2.The program will expand CT education to the larger community</li> <li>3.The community will be better informed on safer sex practices and places where there is free testing</li> <li>4.Will begin to see EPT used indefinitely in the STI clinic</li> <li>5. Adding treatment for gonorrhea to EPT protocol</li> </ol>

*Appendix F*

Project Timeline Flow Graphic

June 2018	July 2018	August 2018	September 2018	October 2018	November 2018	December 2018	January 2019	February 2019
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Site  
Approval

IRB

Ongoing Education of Staff and Other Providers

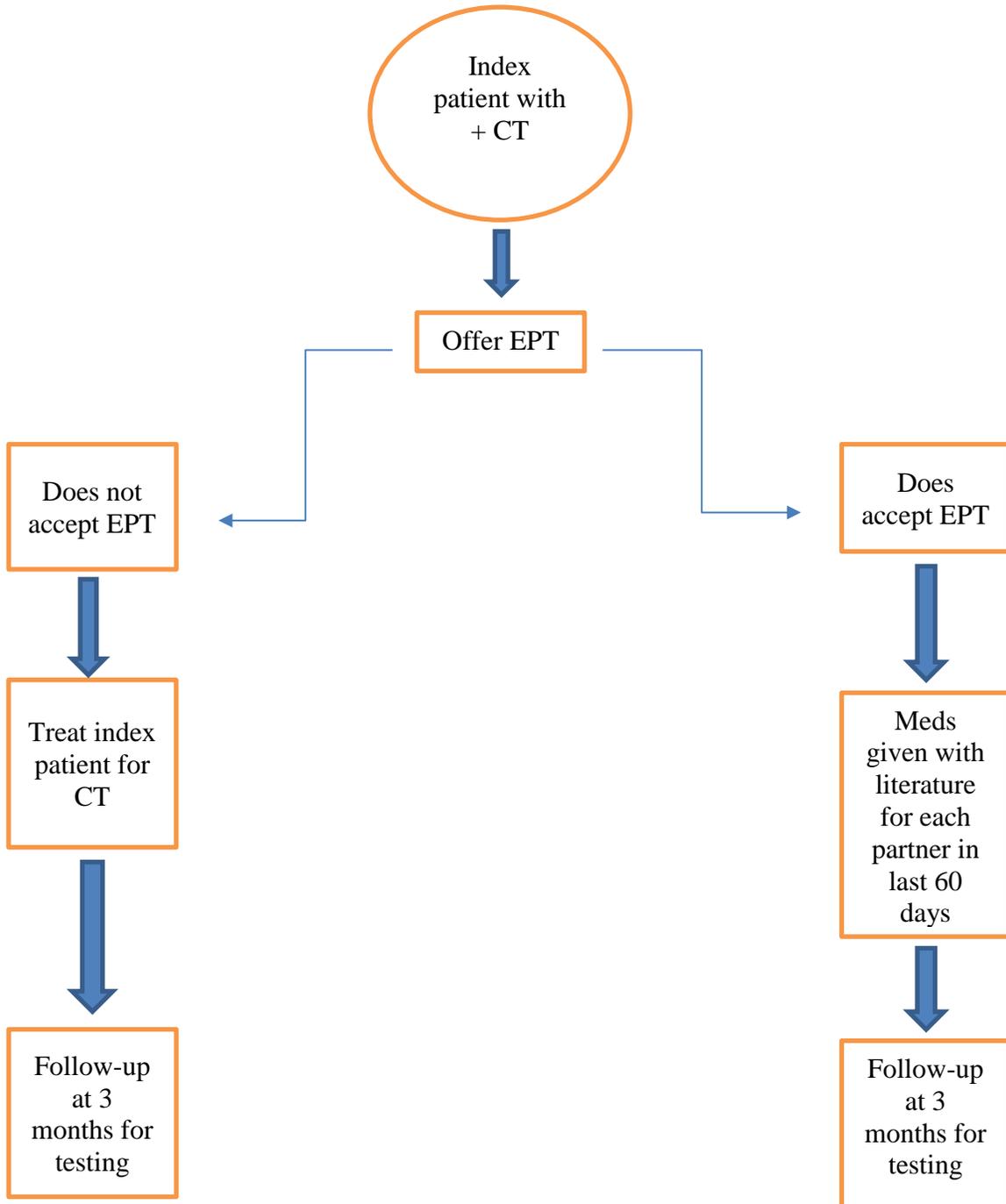
Offer EPT to patients positive for  
CT for 3 months

Patients testing positive will return  
to clinic for test-of-cure at three  
months

Statistical analysis of data

Appendix G

Intervention Flow Diagram, Procedure



*Appendix H***Addressing core public health needs and increasing life expectancy**

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**You may have chlamydia. It is important that you get treated.** Your sex partner was recently treated for chlamydia, an infection you get from having sex with a person who is already infected. Many people with chlamydia do not know they have the infection because they feel fine. The best way to take care of yourself is to see a doctor, go to your local health department or visit a family planning clinic. If you are not able to see a medical provider, you should take the medicine in this package.

**Women:** If you have symptoms of abdominal or pelvic pain, it is important that you see a doctor to be certain you do not have pelvic inflammatory disease (PID), which can be serious and lead to infertility, pregnancy problems or chronic pelvic pain.

**Men who have sex with men (MSM):** It is very important that you see a medical provider and get tested for HIV and syphilis as many with chlamydia or gonorrhea will be infected and not know it.

**THIS ANTIBIOTIC ONLY TREATS YOU FOR CHLAMYDIA****Directions for taking Chlamydia medicine  
Azithromycin (Zithromax) 1gm**

**Swallow all the enclosed pills. These should be taken one after another at the same time, not on separate days. Some people have mild, upset stomach (which does not last long) after taking this medicine.**

These medicines are antibiotics and are very safe. However, you should not take them if you have ever had an allergic reaction to azithromycin (Zithromax), erythromycin, or clarithromycin (Biaxin). If you are uncertain about whether you have an allergy, call your doctor or pharmacist before taking this medicine. If you have a serious, long-term illness like kidney or heart disease, colitis or stomach problems, talk to your doctor before taking this medication.

After taking these medicines, do not have sex for 7 days. Do not share these medicines or give them to anyone else. It is important to tell everyone you have had sex with in the last 60 days that they need to see a medical provider.

If you have any questions, call the STI clinic. If you think you may be having bad reactions to this medicine, call your medical provider or pharmacist. If you have a serious reaction, like difficulty breathing (which is very rare), go to your nearest emergency room and bring the empty medication packet with you.

PLEASE READ CAREFULLY: THIS IS IMPORTANT INFORMATION ABOUT YOUR SEXUAL HEALTH



Expedited Partner Therapy (EPT)

## A Guide for Partners

### Why am I getting extra medicine?

One of your sex partners has been diagnosed and treated for chlamydia, a disease that is transmitted by having sex. You also need to be treated so you don't develop serious health problems, re-infect your sex partner, or pass it on to others.

### What is Expedited Partner Therapy?

A health care provider has given your sex partner an antibiotic to give to you so that you can be treated for chlamydia. This is called Expedited Partner Therapy (EPT) and is a convenient, fast and private way for you to be treated.

### Will this medicine cure all STDs?

No. This antibiotic will ONLY cure chlamydia and is 97% effective. If you think that you may have been exposed to other STDs or you just want to be sure you don't have anything else, you should visit a health care provider and discuss your concerns.

### What should I do next?

**Do not have sex (vaginal, oral or anal) for at least 7 days after you and your sex partners have been treated.** The antibiotic takes 7 days to work. You can get chlamydia again if you have sex before the medicine cures you and your partner.

**See a health care provider and get checked for other STDs (including HIV).** Even if you take the antibiotic, it is important to get tested for other STDs because you can have more than one STD at a time. This medicine only cures chlamydia.

### Common Questions

**What if I don't take this medicine?** If you decide not to take the medicine, you should see a health care provider to get tested as soon as possible. Chlamydia that is not treated can lead to serious health problems and can be spread to other sex partners.

**What if I don't think I have chlamydia?** Many STDs don't cause symptoms. You can have chlamydia even if you feel fine. Because you had sex with someone who has chlamydia, you might also have it, and you should be treated.

### Avoid Sexually Transmitted Diseases

STDs are common – millions of people get them each year. Even if you had chlamydia before, you can still get it again. The only way to completely avoid STDs, including HIV, is to not have sex. If you do have sex, do it safely. **Use a latex condom every time and for every kind of sex – oral, anal and vaginal.**

You can reduce your chances of getting chlamydia and other STDs, including HIV, by limiting the number of people you have sex with. The more sex partners you have, the higher your risk of getting an STD.

*Appendix I*

## Results Table

	N=14	Female=10	Male=4
Accepting EPT	8	7	1
Acceptance Rate	57%	87.5%	12.5%

N=total number of CT only cases



*Appendix K*

## Faculty Approval Letter



July 11, 2017

Members of UMKC Institutional Review Board  
University of Missouri-Kansas City  
Kansas City, MO 64108

Primary Project Site  
IRB

UMKC IRB or Primary Project Site IRB,

This letter serves to provide documentation regarding Sherri Sellers' Doctor of Nursing Practice (DNP) Project proposal. Ms. Sellers obtained approval for her project proposal, *The Effects of Expedited Partner Therapy on Reoccurrence of Neisseria Gonorrhoea and Chlamydia Trachomatis in Inner City Adolescent and Young Adult Females*, from the School of Nursing DNP faculty committee on July 11, 2017.

If I can provide any further information, please feel free to contact me.

Sincerely,

A handwritten signature in cursive script that reads "Susan J. Kimble".

Susan J. Kimble, DNP, RN, ANP-BC, FAANP  
Clinical Associate Professor  
DNP Programs Director  
UMKC School of Nursing and Health Studies  
816-235-5962  
[kimbles@umkc.edu](mailto:kimbles@umkc.edu)