January 2019

The Care Of The Sexual Assault Patient

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A Thesis Submitted to the
Yale University School of Medicine
in Partial Fulfillment of the Requirements for the
Degree of Doctor of Medicine

by

Eun Sook Jennie Choi

2019

Acknowledgements

To my parents who have taught me compassion, dedication and sacrifice,
사랑해요.

To my mentors who have not only contributed their generous time and energy to support my research endeavors but have also inspired me by example to become a compassionate, motivated healthcare provider who strives for justice of the vulnerable patient.

Dr. Shefali Ram Pathy
Dr. Kirsten A Bechtel
Dr. Sangini Sheth
Dr. Seth Guller

Funding

Research reported in this thesis was supported in part by

Yale School of Medicine Medical Student Research Fellowship
National Institute on Alcohol Abuse and Alcoholism of the National Institutes of Health under award number T35AA023760.
The content is solely the responsibility of the author and does not necessarily represent the official views of the National Institutes of Health.

CARE OF THE SEXUAL ASSAULT PATIENT.

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Survivors of sexual assault (SA) experience a range of physical and mental health consequences. Despite universal agreement that follow-up care improves outcomes, studies demonstrate only one-third of survivors receive assault related follow-up care. This study aims to describe the patient population presenting after SA, characteristics of their acute care, and rates of follow-up within one-year at two sites of the Yale New Haven Hospital, which includes an urban tertiary care hospital (York Street Campus, YSC), and its satellite community hospital (St Raphael Campus, SRC). A retrospective medical record review was conducted of patients older than 12 years presenting after sexual assault at emergency departments and outpatient clinics from Jan 2014 to Feb 2017. Differences between groups based on assault characteristics, such as assailant relation and substance use, were analyzed using Chi Square. Correlations with age were analyzed with linear regression. Of the 466 patient encounters that met inclusion, the mean patient age was 25.5 years (σ=12y); 95% were female; 46% were White and 35% were Black. The overall follow-up rate within one year after index visit was 35% (165/466). Patients older than 18 years had significantly lower rates of follow-up (23%, 73/318) than adolescents 13 to 18 years old (61%, 91/148) ($p<0.05$). Younger patients were more likely to receive recommended testing ($p<0.05$), and follow-up ($p<0.001$). Within adolescents, assault by a known individual significantly increases rates of follow-up (69% vs 41%, $p<0.05$), especially if by a family member (9/9, 100%). Follow-up after SA at our institution are low, consistent with the national average, and significantly lower in older survivors. Adolescent victims receive protocolized follow-up at a designated sex abuse clinic, are more likely to have the involvement of a case manager. Implementation of a standardized discharge protocol that involves follow-up at the Women's Center—the ambulatory OBGYN clinic—and a designated care coordinator for navigation, may improve rates of follow-up of older survivors of SA.

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Introduction

Epidemiology

Sexual assault is a widespread public health issue; approximately 1.3 million sexual assaults occur annually against women[1] with an estimated 19.3% of all women (23 million) reporting rape once in their lifetime[2]. The American Medical Association reported 1 in 5 women will experience sexual assault before the age of 21 years.[3] Sexual assault against men is also significant; studies have found nearly 1.6 million men are raped at least once in their life.[3] Teenagers and young adults are particularly vulnerable to sexual assault. The age group with the highest rate of sexual assault is 12 to 34 years old, according to one national survey.[4] Another study showed that 18% of girls and 12% of boys reported an unwanted sexual experience in middle- or high-school.[5] In the National Intimate Partner and Sexual Violence Survey (NIPSVS) national survey conducted by the CDC, nearly 80% of respondents reported their first rape as occurring before the age of 25 years old, and 42% of respondents before 18 years old.[1] Another national survey of high school students found 11.3% of females and 3.5% of males reported unwanted sexual intercourse.[6]

The incidence and prevalence of sexual assault greatly depends on the definition employed as well as the methods of data collection. National surveys such as the NIPSVS conducted by the Centers for Disease Control and Prevention (CDC), and the National Crime Victimization Survey (NCVS) collected by the Bureau of Justice Statistics, attempt to overcome the reporting challenge by employing a uniform definition and large data source. Appropriate definitions of and statistics of sexual assault is extremely important in qualitative and quantitative research of this significant health issue.

Retrospective and prospective studies have been conducted in the medical setting to characterize the care provided to sexual assault survivors who interface with the healthcare system. The current understanding of the care of victims of sexual assault is the focus of the remainder of this section.

Definitions

The definition of sexual assault can vary from a crime of violence and aggression, ranging from sexual coercion—such as unwanted kissing, touching and fondling—to rape.[7] In 2011, the Federal Bureau of Investigation (FBI) initiated a revision to the definition of rape to better characterize this important health issue for future national statistic reports in the Uniform Crime Report. The revised FBI definition was published in 2013, which now includes assault cases with male victims, female assailants, all forms of sexual contact such as anal and oral penetration, and penetration by an object in the designation of rape.[7] In addition, physical force is no longer required to categorize an incident as sexual assault, thereby including events where individuals are unable to consent due to intoxications or mental or physical incapacity.[7]

More specific terms exist within the sexual assault umbrella, based on the assailant's relationship to the victim (acquaintance rape, date rape, incest), and the victim's age (child sexual abuse, statutory rape). Child sexual abuse is sexual assault of an individual under 13 years of age, and always necessitates the involvement of child-protective services and law enforcement. Classification of statutory rape based on age can vary by state, ranging from 14 to 18. In the state of Connecticut, the age of consent is 16

years old, but there are exceptions based on the assailant's age and relationship to the patient.[8, 9]

- If the sexual activity involves a person of authority (i.e., teacher or coach), the age of consent rises to 18 years old.
- If both individuals are under the age of consent, the "close-in-age exemption", also known as the "Romeo and Juliet law" allows for legal consent in cases where both individuals are significantly close in age. This allowed age difference further varies based on individuals' age.
    - Under the age of 13 years, sexual activity can be consensual with an age difference of 2 years or less.
    - Between ages of 13 and 16, parties can legally consent with another individual with an age different of 3 years or less.

Healthcare professionals are commonly the first to interface with patients after sexual assault. Therefore, it is important for providers to have an understanding of the various nuances in the laws, as well as collaborate closely with social work and law enforcement professionals when caring for child and adolescent survivors of sexual assault. Sexual assault is both a medical concern as well as a legal concern; thus, promoting the wellbeing of a survivor requires recognizing the importance of both arenas. For example, the acute care of a patient presenting after sexual assault, discussed below, includes the timely collection of forensic evidence, which affects likelihood of perpetrator prosecution. As a result, medical providers must be aware of the legal implications of the forensics examination.

Medical Examination

It is difficult to estimate the fraction of survivors who present to a health care provider after a sexual assault. Survivor reports suggest despite the significant prevalence of sexual assault, only 17% to 43% interface with the healthcare system for evaluation and treatment, 23% of female survivors seek care from a victim service agency, and only one-third disclose assault to their primary care provider.[4, 10, 11] Of the 35% of females who reported suffering an injury from the sexual assault in 2005-2010, 20% received treatment at the scene or at a residence, as opposed to presenting to a hospital, doctor's office or emergency room.[4]

Medical and forensic examinations after sexual assault have potential to retraumatize the patient; therefore, involvement of an experienced clinician is important to develop a therapeutic alliance with the patient while providing all necessary medical care while minimizing unnecessary ones. Immediate post-assault management can be a challenging balance for a provider, since medical, psychological, legal and social needs must be acknowledged and appropriately addressed. To aid the providers, recommendations for best practices of acute care of the sexual assault patient have been published by The Centers for Disease Control and Prevention (CDC), the American College of Obstetricians and Gynecologists (ACOG), the American Academy of Pediatrics (AAP), and the American College of Emergency Physicians (ACEP).[12-15]

Many of the specialty-specific organizations reference the most recent (2015) CDC guidelines for the management of patients presenting after sexual assault. These guidelines provide recommendations for testing and treatment. Recommended testing includes pregnancy, hepatitis B, HIV, and syphilis. Treatment includes empiric treatment

for gonorrhea, chlamydia, and trichomonas (testing if treatment is refused), emergency contraception for pregnancy prevention, and considerations of hepatitis B, HPV vaccination, and HIV post-exposure prophylaxis based on risk stratification.[12] The CDC recommendations do not address the topics of forensic evaluation and management of psychological trauma, physical injuries and potential pregnancy,[12] possibly lending to the wide variation of care provided in these areas.

Despite published recommendations, adherence to these guidelines is low.[16, 17] Hoehn et al postulated that the variation in care is due to the lack of provider knowledge, and reported a 30% improvement in algorithm-adherent evaluation and management after implementing targeted education and an electronic order set.[17] Another study in an urban hospital with an established Sexual Assault Nurse Examiner (SANE) program reported that patients evaluated by a trained SANE were more likely to have proper documentation (GU exam P<0.001, GU injury P<=0.001), and higher rates of STI testing (GC/CT P<=0.001, hepatitis B and C P=0.03, HIV P=0.03) than when a SANE was not involved.[18]

In addition to the challenges of clinical management, the process of testing, treatment, evidence collection and interviewing can be very lengthy, involving numerous parties including medical, legal, and social professionals. In the case of younger patients, care takers and case managers from the Department of Children and Families (DCF) are also involved in this exhausting process. Awaiting sobriety in drug facilitated sexual assault cases (DFSA) can further delay this process. The presence of a sexual assault crisis advocate (SAC) can be especially helpful in navigating the acute evaluation for all patients, but especially for the younger or more vulnerable patients. Resources for sexual

assault crisis support vary regionally. In Connecticut, there are 9 SAC Programs available to dispatch a certified sexual assault victim advocate for short term supportive counseling, case management, and accompaniment for medical, police and court attendance.[19]

Forensic Evaluation

Though the process of forensic examination and evidence collection occurs in a medical setting, requiring the involvement of a healthcare professional, the purpose for such examination is strictly legal and for the prosecution of the perpetrator. For example, toxicology results from the forensic kit are not to be used for medical decision making, and independent tests should be conducted for recording in a medical chart. The forensic exam kit –also known as the rape kit, Sexual Assault Evidence Collection Kit (SAECK), Sexual Assault Forensic Exam (SAFE) kit, Sexual Offense Evidence Collection (SOEC) or Sexual Assault Nurse Examiner (SANE) kit—is provided by the state's department of health. Policies on eligibility for forensic collection and best practices differs regionally, but the general components and the process are universally standardized. It involves a written narrative of the assault in the patient's words, documentation of a physical exam, collection of swabs and clothing potentially containing DNA of the assailant, and toxicology samples. In the State of Connecticut, the General Assembly aims to standardize this process statewide. The general guidelines for forensic examination, as well as guidelines specific to Connecticut will be reviewed in the remainder of this section. The specific steps for collection and maintaining chain of custody are beyond the scope of this section.

It is ideal for qualified health care providers trained in this process to be involved with conducting a forensic exam, such as an emergency medicine physician, sexual assault nurse examiner (SANE), sexual assault forensic examiner (SAFE), a physician or nurse practitioner specializing in sex abuse. Maintaining a proper chain of custody and accurate documentation are imperative as this process has legal implications. There are several additional requirements for the proper collection of evidentiary data. For example, it is preferable for the survivor to not change their clothes, bathe/shower, eat/drink, urinate/defecate or douche until they have been examined. However, if they have done so, they should still be encouraged to seek care and undergo evidence collection, with proper documentation by the healthcare provider. In order for a forensic evidence kit to be legally admissible, it must be collected within a specific timeframe. In the State of Connecticut, the eligibility window for evidence collection is 120 hours (5 days) and varying time frames for toxicology collection, ranging up from 8-48 hours after suspected drugging. [19] Table 1 provides more details on the allowed windows for toxicology collection. Routine toxicology collection is not recommended but may be indicated if the patient has signs and symptoms of intoxication, or if the patient or accompanying individual suspect drug involvement.

Table 1: Eligible Time Frames for Toxicology Collection through SAECK Kits

Time frame	Test	Substance
< 8 hours	Blood test	GHB (gamma-hydroxybutyric acid)
< 12 hours	Urine test	GHB
< 24 hours	Blood/Urine	Ethanol
< 48 hours	Blood	Other substances
< 120 hours	Urine	Other substances

While the forensic kit is secondary to providing exemplary health care, this time-sensitive collection has long term implications in the criminal investigation and legal proceedings. The Bureau of Justice Statistics reports only 36% of female victims of sexual assault from 2005 to 2010 reported to police. It is well recognized that sexual assaults are underreported to law enforcement, with several factors complicating the decision to pursue prosecution of the offender. Reasons for this include fear of reprisal or getting the offender in trouble (28%), feeling like sexual assault is a personal matter not requiring involvement of authority (20%), believing authority would not be able to help (13%), thinking it was not an important enough issue to report (6%), and a variety of other reasons (33%).[11] According to the U.S. Department of Justice, the offender in approximately three-quarters of sexual violence is a family member, intimate partner, friend, or acquaintance.[4] Therefore, patients often have difficulty committing to pressing charges against the perpetrator, particularly in the face of emotional and physical trauma during the acute phase after assault. It is important for healthcare providers to appropriately counsel patients about evidence collection and particularly the time restrictions for collection, and balance that with information that there is the "nonreport option," in which completion of the evaluation does not require the patient to report or take legal action.[14, 20] Furthermore, many law enforcement agencies will give the option to hold the forensic result for 2 or more years, providing the patient with time to decide their preferred course of legal action.

Forensic evidence collection requires obtaining legal consent from the patient. This can be complicated by various factors including age, involvement of mental status altering substances, and capacity to consent such as cognitive delay. The age at which a

patient can consent for the forensic exam is state dependent, but regardless of the age, adolescents should never be coerced to undergo the evaluation. In the state of Connecticut, minors under the age of 18 require parental consent for forensic evidence collection. In the case of suspected child sexual abuse, the Department of Children and Families and law enforcement will be consulted and aid in consent. The patient may withdraw their consent and decline the exam or contacting of law enforcement at any point in the process. Upon initial medical evaluation, the provider may choose to place a referral for a formal forensic examination at a sexual assault specialty center with an interdisciplinary professional staff with expertise in treating adolescent assault patients. Such a team may include a medical provider, a social worker, and a detective.

Psychological Sequelae

The psychological effects after sexual assault can vary and can also be similar to those who have not experienced assault. Survivors of sexual assault are at increased risk for suicide as compared with the general population in addition to other psychological sequelae.[21] It can be therapeutic for patients to be educated on the signs and symptoms of post-traumatic psychiatric sequelae, validate the significance of the trauma and be given psychosocial resources to support and counsel the patient.

- *Rape trauma syndrome* is a disorder that may manifest in the weeks to several months following the incident. There can be behavioral, somatic, psychological disruptions resulting from the trauma.[22]
- *Disorganized phase*- Acutely, rape trauma syndrome manifests as a generalized lack of organization within the patient's life. Fear and blame are prominent

components, contributing to the likelihood of the patient being lost to follow up. In this phase, patients are also likely to experience generalized physical pain, eating, mood, sleep disturbances.[22]

- *Organized phase*- The delayed phase is a more chronic state manifested by phobias, nightmares, flashbacks, somatic and gynecologic symptoms.[22, 23] Though physical examination is most likely to yield normal findings[24], it is important to validate and recognize the somatic complaints as part of the rape trauma syndrome.
- *Post Traumatic Stress Disorder*- Approximately one-third of survivors suffer from PTSD. This psychiatric disorder is a state of hyperarousal, characterized by "re-living" the trauma. Patients affected by PTSD display avoidance behaviors and are at risk of chronic substance abuse.[22, 23]

Some groups suggest that interventions in the immediate post-trauma period may modulate the course of the aforementioned mental health dysfunctions. Resnick et al found that patients who watched an educational video on the potential long-term affects of their trauma, reported lower anxiety at their initial presentation than those who did not receive this intervention.[24] Early interventions could lower the severity of psychopathology and risk of substance misuse.

Follow Up Care

Follow up examination and continued engagement in care is necessary for an opportunity to review results from serologic testing, assess tolerance of medications, examine for any new symptoms, address psychosocial needs, and provide counseling.[12-14]

Specifically, the CDC outlines the medical need for follow up visits starting within 1 week and up to 6 months to complete Hep B and HPV vaccinations if indicated, monitor for side effects and adherence to PEP medications, and repeat testing for pregnancy and STI if there was an initial negative test and infection in assailant cannot be ruled out.[12] Furthermore, no matter the thoroughness of the care provided upon initial examination, a trauma survivor is likely to have difficulty remembering the information given to them. The follow-up provides an opportunity to re-address the medical testing and treatment provided, signs and symptoms for new or developing infections and psychological trauma, and medical and psychosocial resources available to the patient.

Despite the well understood need for continued care, rates of follow up amongst survivors of sexual assault are low with studies reporting follow up rates ranging between 10-35%.[24-26] Darnell et al reviewed patients ages 15 years and older presenting to an emergency department for rape or suspected rape, and found 28% attended the recommended medical/counseling follow-up appointment scheduled to take place 1 to 2 weeks after the ED visit.[25] Holmes et al conducted a study of adolescent and adult patients referred to a specialty clinic called SAFE (Sexual Assault Follow-up Evaluation) and found a total of 31% (n=122) of sexual assault victims returned for follow up.[24] Ackerman et al found 35.5% of their cohort of sexual assault patients ages 15 years and older presenting to an urban emergency department, attended follow-up.[26] Herbert et al assessed follow up within 6 weeks of the index visit, and reported a rate of 10%.[27]

Statement of purpose

It has been well documented that survivors of sexual assault are at risk for numerous immediate and long-term comorbidities both medically and psychologically,

necessitating appropriate acute care and follow-up adherence. Though studies report a wide range of follow-up rates, adherence and utilization of post-assault care are universally and historically low. The purpose of this study is to get an understanding of the care provided to patients presenting after sexual assault across two sites at the Yale New Haven Hospital (YNHH). By identifying specific characteristics of the patients, their assault narrative, the acute visit and follow-up care, the overall aim is to inform possible strategies for improved engagement and outcomes as well as encourage continued quality improvement study in the care of this vulnerable patient population. YNHH consists of two sites: York Street Campus (YSC), an urban tertiary care center, and its satellite community hospital, St. Raphael Campus (SRC). Both of the hospital sites included in this study has a referral system to the Child Sex Abuse Clinic, a comprehensive care program (medical, psychiatric, forensic) for pediatric and adolescent patients under 19 years of age. Currently no such referral protocol or system for exists for adult patients. It is possible that patients older than 19 years could benefit from a similar standardized referral protocol, and the YNHH Women's Center—the ambulatory OB/GYN clinic located at the YSC site—could be an underutilized resource. Due to this difference in age-related resource, further analysis comparing the subgroup of adolescent patient encounters to the adult patient encounters will be conducted to investigate possible differences in outcomes due to variations in age.

Specific Aims

- **Aim 1:** Describe the population of patients presenting after sexual assault to Yale New Haven Hospital (YNHH) at its two campuses- the York Street Campus

(YSC), the urban tertiary care center, and its satellite community hospital at St. Raphael Campus (SRC).

- **Aim 2:** Analyze patient encounters for characteristics of clinical management, reported assault narrative, medical and forensic documentation, involvement of various interdisciplinary professionals (SANE, social worker, law enforcement, DCF, sexual assault crisis advocate), and discharge planning.
- **Aim 3:** Investigate the overall rate of assault-related follow-up care within one-year after index visit and identify associated factors.

Materials and Methods

Study Population

After approval from the Institutional Review Board, the Joint Data Analytics Team (JDAT) compiled medical records for analysis of patient encounters with report of sexual assault. We conducted a retrospective medical record review of the encounters through Epic, the electronic medical record (EMR) system utilized at Yale New Haven Hospital (YNHH). We included patients older than 12 years of age, presenting to the emergency departments and outpatient clinics (primary care and OB/GYN), between January 2014 and February 2017. The encounters of interest were identified as first disclosures and initial presentations of sexual assault.

Initially, a broad list of ICD (International Classification of Diseases) codes were used as the main inclusion criteria to identify all visits resulting in evaluation and care after sexual assault. Medical record review of the patients revealed that a subset of patients had multiple hospital encounters for evaluation after acute sexual assault, some

of which were not captured with the ICD criterion. At this point, the searchable "Chief complaint" field of the EPIC EMR system was employed as a second inclusion criterion and was used in conjunction with the ICD codes. The final data set is a collection of the data compiled from ICD codes and Chief Complaints.

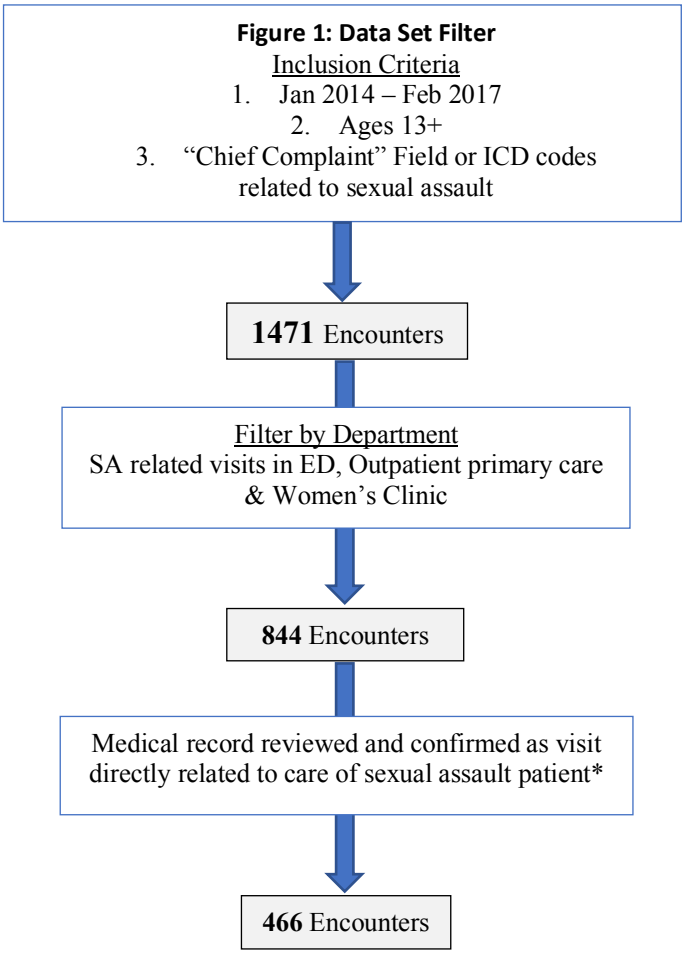
Table 2: International Classification of Diseases (ICD) Code List for Data Set Inclusion

	ICD10	Description
1	Z04.4*	Encounter for examination and observation following alleged rape
2	T74.*	Adult and Child abuse, neglect, and other maltreatment, confirmed (including Sexual Abuse)
3	T76.*	Adult and Child maltreatment, suspected (including Sexual Abuse)
4	T19	Effects of foreign body in genitourinary tract
5	T19.2	Foreign body in vulva and vagina
6	T19.8	Foreign body in other parts of the genitourinary
7	T19.9	Foreign body in genitourinary tract, part unspecified
8	S30	Superficial injury of the abdomen, lower back, pelvis and external genitals
9	S31	Open wound of abdomen, lower back, pelvis and external genitals
10	S37	Injury of urinary and pelvic organs
11	S39	Other and unspecified injuries of abdomen, lower back, pelvis and external genitals

Table 3: "Chief Complaint" Field for Data Set Inclusion

Sexual Assault
Sexual Assault Exam Referral
Possible Sexual Assault
Sexual Problem
Alleged child Abuse
Sexual Dysfunction

A total of 1471 encounters were identified between January 2014 and February 2017 of patients ages 13 years and older, that were assigned a chief complaint of or ICD code related to sexual assault. From these encounters, only those visits to an emergency department or outpatient clinic for primary care or OB/GYN were considered, as disclosures of sexual assault would most likely result in a referral for evaluation by these departments. This filter yielded 844 unique encounters. We then performed a more in-depth medical record review of the notes linked to the encounter to validate the visit for initial evaluation of sexual assault, resulting in 466 encounters in the final data set.



Of note, the ICD code criterion alone yielded 284 index visits after sexual assault. Adding the second, supplementary criterion of "chief complaint", identified an additional 184 encounters for sexual assault, increasing the data set by 35%. Table 4 compares the demographics between these two subsets of data: the encounters captured by the ICD inclusion criterion, notated (+)ICD, and those only captured once the EMR's "chief

complaint" field was used, notated (-)ICD. There was no significant difference in demographics of these two groups.

Table 4: Comparison Between Demographics of Data Subsets

	(+) ICD		(-) ICD		X^2
SEX					
Female	268	95%	175	96%	p=0.65
Male	15	5%	8	4%	
AGE					
Average, SD (y)	25.85	11.98	25.60	12.03	
13-18 y	92	32%	57	31%	p=0.76
19+ y	193	68%	127	69%	
ETHNICITY					
Non-Hispanic	225	79%	142	77%	p=0.95
Hispanic or Latino	57	20%	38	21%	
Unknown	*2*	*1%*	*1*	*1%*	
PRIMARY RACE					
White or Caucasian	130	46%	85	46%	p=0.82
Black or African American	99	35%	68	37%	
Not Listed	*49*	*17%*	*26*	*14%*	
LANGUAGE					
English	274	96%	169	92%	p=0.08
Spanish	7	2%	9	5%	
Other or Not Listed	*3*	*1%*	*6*	*3%*	

Further investigation of the ICD(-) encounters revealed that these encounters had either (1) codes related to a second medical concern (e.g., alcohol intoxication, homicidal ideation), (2) a code that is not part of the ICD-10 directory (e.g., IMO code), or (3) a code that is broad and nonspecific to sexual assault (e.g., pelvic pain, anal pain, HIV exposure).

All nonzero concern of sexual assault warranting a visit for forensic or medical evaluation were included in the final data set. For example, encounters in which the patient self-presents or accompanied by a parent requesting a Sexual Assault

Evidence Collection Kit (SAECK) were always included, even if the patient denies having any memory of being assaulted nor any signs or symptoms of assault. These cases were most commonly in a setting of memory altering substance use.

Excluded from the data set were: patient encounters with a distant history of sexual assault, sexual assault that has already previously been addressed by a healthcare provider, and assault that has been identified as nonsexual or nonphysical abuse. Cases of minors reporting consensual sexual activity were carefully reviewed for statutory rape, and those with age differences allowing for consent were excluded (see discussion of statutory rape in Definitions). In patient cases that resulted in a direct transfer of care between the two emergency departments in the study, the encounter providing more thorough care was included, and the other encounter excluded. For example, if a SANE nurse was not available at SRC, the community hospital, requiring a transfer of the patient to the emergency department at the larger tertiary care hospital (YSC), the first encounter was excluded and the encounter at the receiving department (where a SANE nurse was available) was included.

Data Elements

A total of 97 variables were identified by a combination of direct extraction from the EMR by JDAT, and manual review of provider notes and scanned documents. Variables of interest included those describing the patient demographics, medical, social and legal management at the index visit, forensic evaluation and kit collection, acute care team members, discharge planning and follow-up.

Dependent Variable

The primary outcome of interest of our study is the attendance of outpatient visits providing sexual assault follow-up care within one year of index visit. Provider notes for all outpatient visits attended within one year, were manually reviewed through the EMR for documentation of clinical management or counseling related to the sexual assault. Providers included physicians, nurse practitioners, social workers, psychologists, and therapists. Though the majority of physician follow-up visits were provided by those in primary care and OB/GYN settings, specialty visits were also reviewed, as patients with chronic conditions, such as diabetes, interface frequently and reliably with their specialists, lending to an opportunity for intervention. Outpatient visits that did not address the sexual assault or refer to medical, psychiatric, social or legal management pertaining to the assault, were excluded. Certain special considerations are discussed below.

In rare cases, documentation of electronic correspondence between the provider and the patient through the patient portal system called MyChart was identified and was considered potentially relevant for our study. Previous research of a piloted text-messaging intervention between nurses and sexual assault survivors in efforts to improve post-assault engagement of care found that this type of electronic communication was effective in relaying information such as signs of safety and well-being and information on non-occupational post-exposure prophylaxis.[28] However, a large portion of their patients (42.5%) stopped responding after the third message, and they rarely utilized offers of assistance such as counseling and advocacy. Similarly, the MyChart electronic correspondences in this study consist mostly of unidirectional messages from the

provider or provider's office to the patient as a reminder for an appointment or notification of testing results. While the unidirectional communication could be useful for sending visit reminders or patient education, bidirectional communication could indicate valuable post-assault medical advice from the provider such as responding to a question posed by the patient regarding testing results or medical/psychiatric concerns, and was considered a successful provision of follow-up care and a valuable opportunity for providers to track the survivor's well-being. There are many psychosocial barriers to care, particularly following sexual trauma, and the availability of electronic communication with providers makes it easier for survivors to maintain contact with their providers. If a patient attended a follow-up visit after sexual assault, the provider type (e.g., primary care, OBGYN, psych, social work) and time lapse between the index visit and follow-up appointment were documented. In the case of multiple visits to a provider after the sexual assault, only the visit soonest after the index visit was recorded.

Independent Variables

- Patient demographics: Patient demographic information was extracted by the JDAT team directly from the EMR as recorded by ED providers (e.g., nurse, medical assistant, social worker) as reported by the patient. These variables include: sex (male/female), age at encounter (years), ethnicity (Hispanic/Latino, or Non-Hispanic/Latino), primary race (White/Caucasian, Black/African American, Asian, American Indian/Alaska Native, Other), and preferred language (English, Spanish, Sign Language, Other).

- Encounter setting: Variables describing the visit setting were also provided by the JDAT team and included: date and time of admission or appointment, discharge time for emergency department visits, encounter department (e.g., pediatric emergency department, adolescent primary care clinic, OBGYN clinic), and hospital campus (York Street Campus or St. Raphael's Campus). These characteristics were gathered to analyze data for outcomes related to the visit setting. Of note, YSC (the tertiary care center of YNHH) has two separate emergency departments for pediatric and adult patient care while the community hospital of St. Raphael's Campus (SRC) has one emergency department caring for patients of all ages. Prior to 2013, the SRC hospital housed its own OBGYN clinic, but in the time frame of this study, women's health patients from both YSC and SRC were all referred to the Women's Center ambulatory clinic at the YSC site. Each hospital has its own primary care outpatient clinics located at their respective sites.
- Assault Narrative: Characteristics of the sexual assault narrative were extracted by manual review of all medical record documentation (medical provider, nursing, social work, SANE) pertaining to the index visit as available in the EMR. When assault narrative data was unavailable by review of the notes, the scanned forensic exam form was reviewed, if available. Variables included: time lapse (between assault and medical presentation), assailant relation to patient (known or unknown, biological or not, solo or multiple assailants), and substance use at time of assault. Time lapse (delay of presentation after sexual assault) is usually explicitly documented in the provider note. However, in cases where this was not

clearly identified, time lapse was estimated with information available from the provider documentation of the assault narrative or the SAECK forensic exam forms. Missing data is documented as null, and supplemented with a reason when applicable, e.g. “patient refused to discuss”.

- Acute Visit Team: Involvement of interdisciplinary professionals during the acute visit (e.g. sexual assault advocate, SANE, social worker, law enforcement, DCF) were also documented by manual review of notes available in the EMR. Documentation by any provider (physician, nurse, social worker) that an advocate, SANE, law enforcement, or DCF case worker was consulted or present was considered sufficient. EMR was reviewed for the presence of a signed note by a social worker their involvement to be considered valid. A SANE team was established at the YSC in 2005 and continued through 2017. While a SANE provider is not always available for forensic and medical evaluation in the emergency department, often times, a certified SANE provider is present as part of their regular patient care assignment. When a SANE provider is not available, ED residents evaluate the cases of sexual assault, with a fellow or attending physician supervising.
- Acute Care and Documentation: Medical and forensic evaluation variables were collected regarding the acute care visit and documentation to investigate testing, treatment, physical examination, and evidence collection. JDAT provided the list of tests and medications ordered during the patient encounters. Further descriptive variables provided indicate if and when the tests/treatment were administered, and test results. Only the medical management that were both ordered and

administered to completion were considered for data analysis. Provider notes and scanned SAECK forms were manually reviewed for documentation of the following physical examination variables: general exam, GU exam, and GU injury. These variables were recorded as follows: Yes (documented), No (not documented without explanation), declined (patient refusal), deferred to SANE (if specifically documented that examination would be deferred for the SANE). Completion of the SAECK kit per provider notes, and availability of the scanned form within the EMR system was also documented.

- Discharge Planning: Discharge plans are documented in both the provider note and the After Visit Summary (AVS) printed for patients. These sources were reviewed for referrals and appointments for follow-up, as well as the presence of printed educational information for patients on sexual assault in the take home forms. Data was collected descriptively, including the type of provider with whom the acute care team (ED physician, SANE, SW) has scheduled follow up, as well as the date of appointment.

Table 5: Data Elements

Variable	Source
Patient demographics	
Patient MRN	Extracted from EMR by data team
Sex	Extracted from EMR by data team
Age at Encounter	Extracted from EMR by data team
Ethnicity	Extracted from EMR by data team > Patient report
Race	Extracted from EMR by data team > Patient report
Language	Extracted from EMR by data team > Patient report

Encounter Setting	
Appointment/Admission Time	Extracted from EMR by data team
Discharge Time	Extracted from EMR by data team
Encounter Dept & Campus	Extracted from EMR by data team
Assault Characteristics	
Delay of presentation	Manual record review > Index visit notes / Scanned SAECK forms in EMR media
Assailant relation to Patient	Manual record review > Index visit notes / Scanned SAECK forms in EMR media
Substance use at time of assault	Manual record review > Index visit notes / Scanned SAECK forms in EMR media
Acute Visit: Team & Care Characteristics	
Sexual assault crisis (SAC) advocate present	Manual record review > Index visit notes
Evaluation by Sexual assault nurse examiner (SANE)	Manual record review > Index visit notes
Social Worker involvement	Manual record review > Social work visit note
Forensic evidence collection with Sexual Assault Examination Collection Kit (SAECK)	Manual record review > Index visit notes
SAECK form scanned into EMR	Manual record review > EMR Scanned Forms
Documentation of Physical Exam	Manual record review > Index visit provider note
Documentation of GU Exam	Manual record review > Index visit provider note
Documentation of GU Injury	Manual record review > Index visit provider note
Presence of GU Injury	Manual record review > Index visit provider note

Tests ordered	Extracted from EMR by data team
Medications ordered / administered	Extracted from EMR by data team
Discharge Planning	
Referrals, provider note	Manual record review > Index visit provider note
Referrals, After Visit Summary (AVS)	Manual record review > After Visit Summary
Written education on Sexual Assault, AVS	Manual record review > After Visit Summary
Follow Up	
Follow-up sexual assault visit	Manual record review > All Provider notes within 1 year of index visit
If Yes: Provider Type	Manual record review > Follow-up visit provider note
If Yes: Time until follow up	Calculated
If No: Any encounters post index visit	Manual record review > List of encounters

Data Analysis

Analysis of the aforementioned variables aims to identify factors associated with compliance of follow-up visits for sexual assault (attended vs did not attend) within one year after the index visit. First described are the patient demographics and acute visit characteristics with descriptive statistics to understand the cohort as a whole, as well as subgroups of adolescents (ages 13 to 18 years) and adults (ages 19 and older). Next, the binary categorical variables (i.e. presence of a sexual assault crisis (SAC) advocate, evaluation by a SANE, assault by a known versus unknown perpetrator, or substance use at the time of assault) were analyzed to evaluate the bivariate relationship with follow-up attendance within one year for significance using Chi-Square analysis. Age as a

continuous variable was analyzed for correlation with follow-up rates using linear regression.

Results

Demographics

A total of 466 patient encounters were identified for the final data set. Table 6 describes the demographics for the 438 unique patients that compose these encounters. The average age was 25.5 years (± 11.9 years); 95% (416) were female; 78% (342) self-identified as Non-Hispanic; 46% (203) self-identified as White/Caucasian and 35% (152) as Black/African American; 94% (413) were English speaking. Of the 438 patients in the cohort, 32% (141) were adolescents ages 13 to 18 years. The average adolescent

Table 6: Patient Demographics

Total unique patients	438	100%
SEX		
Female	416	95%
Male	22	5%
AGE		
Average, SD (y)	25.5	11.9
13-18 y	142	32%
19+ y	294	67%
ETHNICITY		
Non-Hispanic	342	78%
Hispanic or Latino	90	21%
Not Listed	*6*	*1%*
PRIMARY RACE		
White or Caucasian	203	46%
Black or African American	152	35%
Asian/Pacific Islander	6	1%
Not Listed	*77*	*18%*
LANGUAGE		
English	413	94%
Spanish	16	4%
Other	6	1.4%
Not Listed	*3*	*<1%*

patient age was 15.7 years (± 1.7 years). Similar to the overall cohort distribution, 96% (135) were female; 73% self-identified as Non-Hispanic; 40% (57) self-identified as White/Caucasian, 40% (56) as Black/African American; 94% (132) were English-speaking.

Adult patients ages 19 years and older, make up 68% (297) of the overall patients. The average age was 30.2 years (± 11.8 yrs); 95% (281) were female; 80% (237) self-identified as Non-Hispanic; 49% (146) self-identified as White/Caucasian, 32% (96) as Black/African American; 95% (281) were English speaking.

Table 7: Patient Demographics by Age Group

	Adolescent (13-18 years)		**Adult** (19+ years)	
Total Unique Patients	142		296	
SEX				
Female	136	96%	280	95%
Male	6	4%	16	5%
AGE				
Average, SD (y)	15.6	1.6	30.2	8.2
ETHNICITY				
Non-Hispanic	106	75%	236	80%
Hispanic or Latino	35	25%	55	18%
Not Listed	*1*	*<1%*	5	2%
PRIMARY RACE				
White or Caucasian	57	40%	146	49%
Black or African American	57	40%	95	32%
Asian	1	<1%	5	2%
Not Listed	*27*	*19%*	50	17%
LANGUAGE				
English	133	94%	280	95%
Spanish	8	6%	8	3%
Other	1	<1%	5	2%
Not Listed	*0*	*0%*	3	<1%

Twenty-two patients presented for more than one acute care encounter following a unique sexual assault. Most of these patients (17/23, 74%) presented for two sexual assault index visits, five patients (22%) presented for three unique sexual assault evaluations, and one patient presented for four index visits. All of these patients were female and English-speaking.

Table 8: Demographics of Patients with Multiple SA Visits

Total Patients with 2+ index visits	22	
# Visits, (min-max)	2 - 4	
SEX		
Female	22	100%
Male	0	0%
AGE		
Average, SD (y)	29.6	13.9
13-18 y	6	27%
19+ y	16	73%
ETHNICITY		
Non-Hispanic	18	82%
Hispanic or Latino	4	18%
PRIMARY RACE		
White or Caucasian	9	41%
Black or African American	9	41%
Asian	1	4.5%
Not Listed	3	13.6%
LANGUAGE		
English	22	100%
Spanish	0	0%

Setting

Just over 80% (383) of the overall 468 encounters were presentations to the urban tertiary care center (YSC), while the remaining 20% encounters were cases at its satellite community hospital (SRC). A vast majority of the encounters (97%, 454) were presentations to an emergency department while only 3% (14) of index visits occurred in the outpatient setting. The visits were distributed across the time frame encompassed in the cohort, with

132 (28%) encounters in the year 2014, 150 (32%) encounters in 2015, 155 (33%) encounters in 2016, and 24 (5%) encounters during the first two months of 2017. Extrapolating the January and February encounters of 2017 gives an estimate of 144 encounters, on par with previous years. Table 9 outlines these details.

Table 9: Encounter Setting

	All		YSC Site		SRC Site	
# Encounters	466		383		83	
DEPARTMENT						
Emergency Dept.	452	97%	370	97%	82	99%
Outpatient Clinic	14	3%	13	3%	1	1%
YEAR						
2014	133	29%	110	29%	23	28%
2015	151	32%	119	31%	32	39%
2016	158	34%	137	36%	21	25%
2017*	24	5%	17	4%	7	8%

Assault Narrative

There are several key characteristics of the assault narrative documented in notes written by the medical provider, social worker and forensic examiner, including the delay of presentation after the sexual assault, the relationship of the assailant to the patient and substance-use as the time of assault. These factors play into the care team's medical, forensic and social management of

Table 10: Distribution of Delay in Presentation

Delay	Visits	%
< 24 hrs	311	67%
< 48 hrs	355	76%
< 72 hrs	384	82%
< 96 hrs	401	86%
< 120 hrs	406	87%
< 1 week	417	89%
< 1 month	440	94%
< 1 year	453	97%
Unknown	12	3%

the patient. In the State of Connecticut, the window of eligibility for completing the sexual assault kit is 120 hours (5 days); more than half of visits were within one-day of the sexual assault (67%, 311/466) and 87% (401/466) of the encounters were within 5 days of the reported sexual assault and therefore eligible for forensic evidence collection.

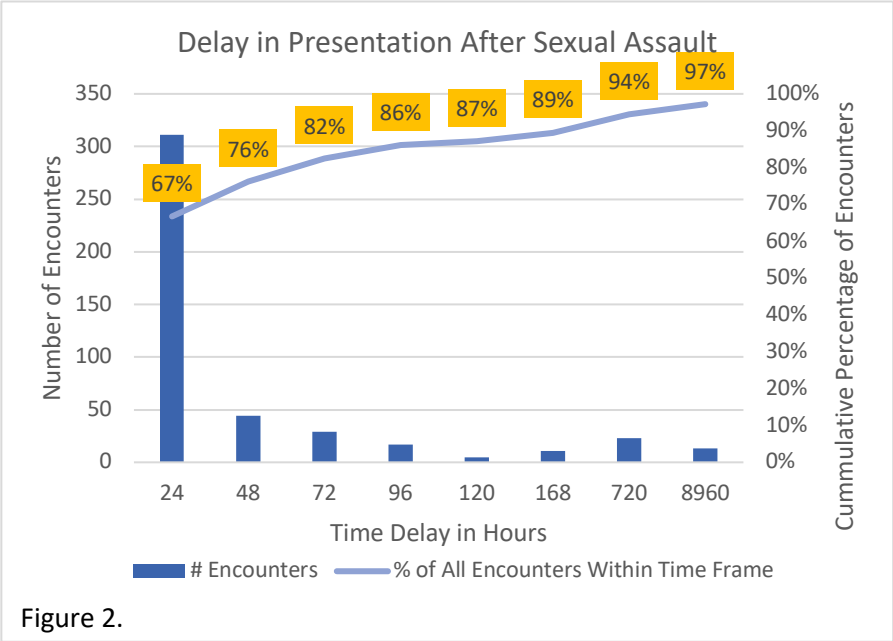


Figure 2.

Table 11: Assailant Relationship

Relationship	#	%
Known Assailant	**306**	**66%**
Acquaintance	294	63%
Family	12	3%
Unknown Assailant	**73**	**16%**
Stranger	69	15%
Trafficking	4	1%
Multiple Assailants	**37**	**8%**
Acquaintances	19	4%
Acquaintance(s) & stranger(s)	2	0%
Strangers	14	3%
Other	**51**	**11%**
Not documented	24	5%
Patient refused to discuss	6	1%
Patient unconscious during SA	21	5%

Assailant Relationship

Assailant relationship lends valuable information when determining risk stratification for STI transmission (knowing the likelihood of the assailant's STI status). Consistent with reported figures, the majority of

assaults were by a known individual. Two-thirds (306/466) of overall patients reported assault by a known assailant, 16% (73) of cases reported an unknown assailant such as a stranger or result of trafficking, and 8% (37) of cases reported multiple assailants. One-tenth of cases (51) did not identify the assailant relationship, and includes cases in which the patient refused to discuss the details of the assault, or the patient was under the influence of memory-altering substances.

Table 12: Assailant Relationship by Age Group

Relationship	Adolescent (13-18 yrs)		Adult (19+ yrs)	
Total Sexual Assault Cases	148		318	
Known Assailant	**97**	**66%**	**209**	**66%**
Acquaintance	88	59%	206	65%
Family	9	6%	3	1%
Unknown Assailant	**24**	**16%**	**49**	**15%**
Stranger	20	14%	49	15%
Trafficking	4	3%	0	0%
Multiple Assailants	**18**	**12%**	**18**	**6%**
Acquaintances	8	5%	11	3%
Acquaintance(s) and stranger(s)	1	1%	1	<1%
Strangers	8	5%	6	2%
Other	**10**	**7%**	**41**	**13%**
Not documented	3	2%	21	55%
Patient refused to discuss	1	1%	5	2%
Patient unconscious during SA	6	4%	15	5%

The distribution of the assailant relationship (known vs unknown) does not differ significantly when compared between the adolescent group (ages 13 to 18 years) and adults (older than 19 years).

Drug Facilitated Sexual Assault (DFSA)

Any use of mentation altering substances—voluntary or forced—at the time of assault is considered a Drug Facilitated Sexual Assault (DFSA). This includes both legal and illegal substances. Most visits (81%, 378/466) had documentation of whether substance-use was involved at the time of the assault; 41% (193/466) of encounters documented suspected or confirmed use of one or more substances—the most common of which is alcohol (34%, 159/466); 40% (185/466) denied any involvement of substances. The DFSA status was unknown in one-fifth (19%, 88/466) of cases either due to patient refusal to discuss the details or simply lack of documentation.

Table 13: Drug Facilitated Sexual Assault (DFSA)

Per Patient Report (All Encounters)

No		**185**	**40%**
Yes		**193**	**41%**
	Alcohol	159	34%
	Marijuana	27	6%
	Cocaine	13	3%
	Prescription Drug	4	1%
	Ecstasy	2	<1%
	Possible roofie	15	3%
	Unknown substance	8	2%
	Heroin	8	2%
	Other	7	2%
Unknown		**88**	**19%**
	Not documented	76	16%
	Patient refused to discuss	8	2%
	AMA/Eloped	4	1%

When analyzed by age group, adolescent cases had a larger percentage of non-DFSA assaults documented (53%, 69/148) than adult cases (33%, 106/318). Alcohol and marijuana make up the majority of substances reported when DFSA is documented.

Table 14: Drug Facilitated Sexual Assault (DFSA) Per Patient Report Adolescents SA Encounters (13-18 yrs)		
Total Encounters	**148**	
No	**79**	**53%**
Yes	**48**	**32%**
EtOH	35	24%
Marijuana	15	10%
Possible roofie	3	2%
Prescription Drug	2	1%
Unknown substance	2	1%
Other	2	1%
Cocaine	1	1%
Ecstasy	1	1%
Heroin	0	0%
Unknown	**21**	**14%**
Not documented	21	14%
Patient refused to discuss	0	0%
AMA/Eloped	0	0%

Table 15: Drug Facilitated Sexual Assault (DFSA) Per Patient Report Adult SA Encounters (19+ yrs)		
Total Encounters	**318**	
No	**106**	**33%**
Yes	**143**	**45%**
EtOH	124	39%
Marijuana	12	4%
Cocaine	12	4%
Possible roofie	12	4%
Heroin	8	3%
Unknown substance	6	2%
Other	5	2%
Prescription Drug	2	1%
Ecstasy	1	0%
Unknown	**67**	**21%**
Not documented	55	17%
Patient refused to discuss	8	3%
AMA/Eloped	4	1%

Acute Care Team

Sexual assault nurse examiners (SANE), social workers, and rape crisis counselors (also known as sexual assault victim advocates) are often consulted for patients presenting for sexual assault evaluation. In our overall data set, 69% (321/466) of visits had an evaluation by a SANE nurse; 31% of visits (38/466) did not have a SANE nurse involved and this includes cases where the patient eloped before being seen, patient

refusal and SANE unavailability. A similar fraction of visits had social work evaluation (67%, 313/466). Only 20% of cases (93, 466) had documented presence of a rape crisis counselor.

Sexual Assault Evidence Collection Kit (SAECK) Completion

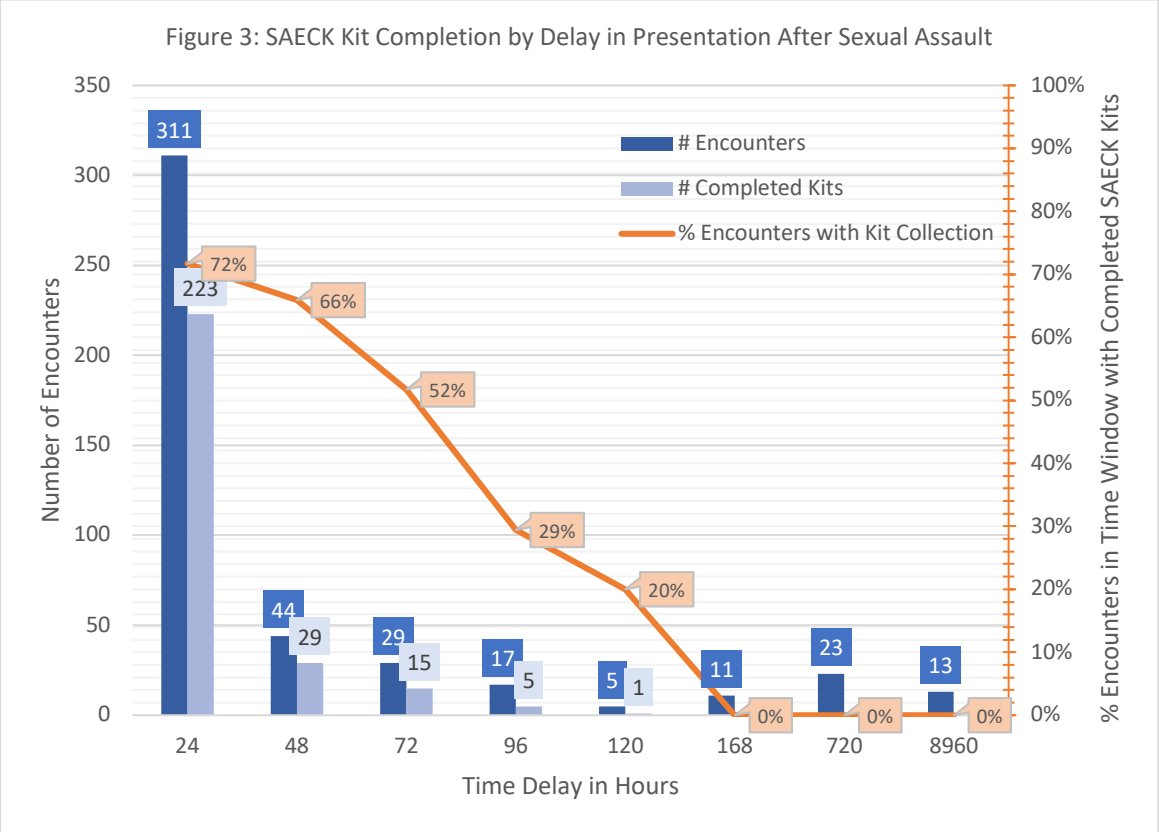
Over 99% of cases reporting a delay of presentation within the eligibility window for SAECK kit collection (120 hours) after sexual assault, had a kit completed with an uploaded scanned copy available in the EMR. Two additional cases without documented delay in presentation also had completion of the kit. None of the cases with a delay in presentation longer than 120 hours had a kit collected. Table 17 and figure 3 detail the rates of forensic kit collection.

Table 16: EVALUATION BY CARE TEAM

All Encounters

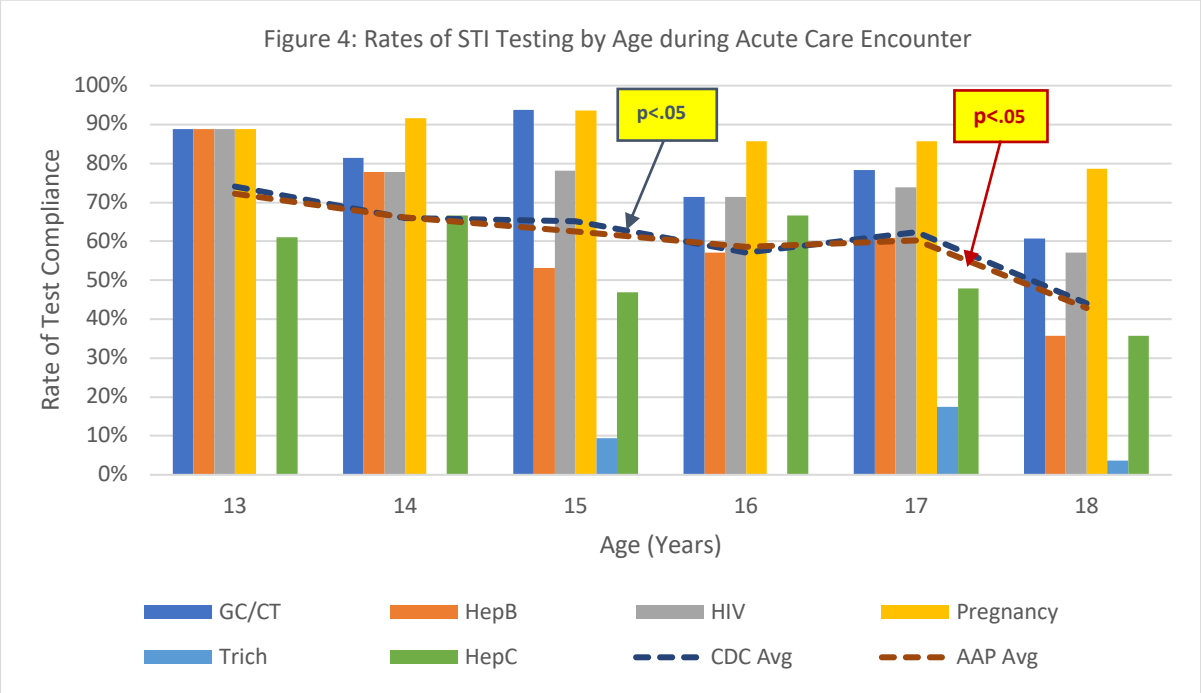
Total Encounters		466	100%
Sexual Assault Nurse Examiner (SANE)			
Yes		321	69%
No		143	31%
	Declined	38	8%
	SANE Unavailable	2	<1%
	AMA/Eloped	10	2%
Unknown		2	<1%
Social Worker Evaluation			
Yes		313	67%
No		149	32%
	Declined	35	8%
	AMA/Eloped	11	2%
Unknown		1	0%
Victim Advocate / Rape Crisis Counselor			
Yes		93	20%
No		362	78%
	Declined	69	15%
	Advocate Unavailable	4	1%
	AMA/Eloped	4	1%
Unknown		11	2%

Table 17: SAECK Completion by Delay in Presentation					
Delay in Presentation after SA			**Forensic Kit Completion**		
Time Delay	Encounters	Cumulative	# Kits	#Cumulative	%
< 24 hours	311	67%	223	223	72%
24-48 hours	44	76%	29	252	66%
48-72 hours	29	82%	15	267	52%
72-96 hours	17	86%	5	272	29%
96-120 hours	5	87%	1	273	20%
5-7 days	11	89%	0	273	0%
1 wk - 1 mo	23	94%	0	273	0%
1 mo - 1 yr	13	97%	0	273	0%
Unknown	12	3%	2	275	17%



Rates of Recommended Testing Amongst Adolescent Patients Presenting After Sexual Assault

The AAP and CDC recommend routine testing for infections after a report of sexual assault. Analysis by age of the adolescent sexual assault cases illustrate that the likelihood of compliance with these tests decrease with age. Figure 4 below shows the rate of each recommended test for a given adolescent age. The dotted lines displays the percentage of all recommended tests (blue for CDC recommended tests, orange for AAP recommendations) that an adolescent is likely to receive given their age.



Rates of Follow-up Care Within One-Year

Consistent with reported rates at other institutions, 35% of all index visits (165/466) have documented assault-related follow-up care within one-year of initial evaluation. Most of these follow-up visits are by a Primary Care Provider (PCP), and a quarter of all visits (25%, 42/165) receive their follow-up at the comprehensive medical,

forensic and social service center for pediatric patients (Child Sex Abuse Clinic). Table 18 details the type of provider seen by patients who received follow-up. If there were multiple follow-up visits providing assault-related care within one year, only the first of these visits were included.

Table 18. Rate of Assault-related Follow Up After SA Index Visit All Encounters		
Total Encounters	466	
Follow-Up Rate	**165**	**35%**
Provider Type Seen		
Primary Care Provider	46	28%
Child Sex Abuse Clinic	42	25%
OBGYN	39	24%
Psych	27	16%
Infectious Disease	10	6%
Social Work	6	4%

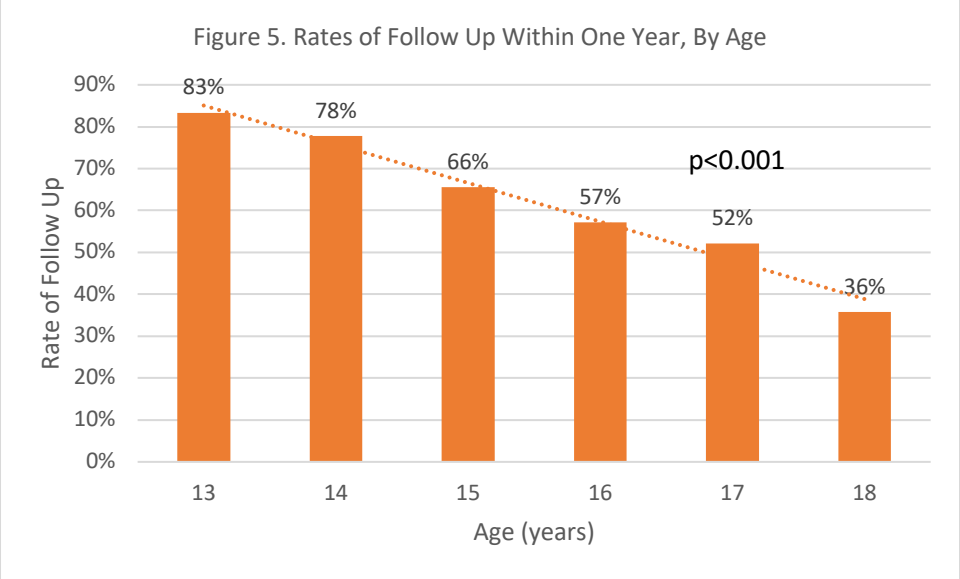
When analyzed by age group, adolescent patients have a significantly higher follow-up rate than adults (61% vs 23%). The provider type to account for most of the first follow-up visits in adolescent cases was the comprehensive Child Sex Abuse Clinic (28% of all adolescent SA cases) while for the adult

Rate of Assault-related Follow Up After Adolescent SA Index Visit (13-18 years)		
Total Adolescent SA Encounters	148	
Follow-Up Rate	**91**	**61%**
Provider Type Seen		
Primary Care Provider	23	16%
OBGYN	9	6%
Child Sex Abuse Clinic	42	28%
Infectious Disease	2	1%
Psych	13	9%
Social Work	3	2%
Rate of Assault-related Follow Up After Adult SA Index Visit (19+ years)		
Total Encounters	318	
Follow-Up Rate	**73**	**23%**
Provider Type Seen		
Primary Care Provider	23	7%
OBGYN	30	9%
Child Sex Abuse Clinic	0	0%
Infectious Disease	8	3%
Psych	14	4%
Social Work	3	1%

cases, the OBGYN was the most likely to provide follow-up care (9%, 30/318).

Factors related to rates in follow-up care within one year

Age, relationship of the assailant, and substance use were significantly correlated with rate of follow-up. The adolescent population was further analyzed for the relationship of age to follow-up rate. As previously discussed, younger adolescent patients were more likely to receive recommended testing, and adolescents had a higher rate of receiving post-assault care within one year when compared with adults. Within the adolescent cases, there is a significant relationship between age and follow-up rate when analyzed with linear regression ($p<0.001$) (figure 5).



Pediatric patients were less likely to be engaged with follow-up care when there was reported substance use or DFSA (48% vs 68%, $p<0.05$).

Table 19. Rates of Follow-Up Based on Drug Facilitated Sexual Assault (DFSA) By Age Group

	All Ages		Adolescent		Adult	
All Encounters	165	35%	91	61%	73	23%

Not DFSA (No substances)	85	46%	68	68%	38	22%
DFSA (Substance involvement)	58	30%	23	48%	35	24%

For patients of all ages, there was a higher chance of receiving follow-up when the assailant is a known individual to the patient (40% vs 27%). Within adolescents, assault by a known individual significantly increases rates of follow-up (69% vs 41%, $p<0.05$), especially if by a family member (9/9, 100%). These are further detailed in table 20.

Table 20. Rates of Follow-Up Based on Assailant Relation

	All Ages			Adolescents			Adults		
	Total	Follow Up		Total	Follow Up		Total	Follow Up	
Known Assailant	**306**	**123**	**40%**	**97**	**70**	**72%**	**209**	**53**	**25%**
Acquaintance	294	114	39%	88	61	69%	206	53	26%
Family	12	9	75%	9	9	100%	3	0	0%
Unknown Assailant	**73**	**20**	**27%**	**23**	**10**	**43%**	**49**	**10**	**20%**
Stranger	69	19	28%	20	9	45%	49	10	20%
Trafficking	4	1	25%	3	1	33%	0	0	-
Multiple Assailants	**37**	**12**	**32%**	**18**	**8**	**44%**	**19**	**4**	**21%**

Discussion

The goal of this study was to get an understanding of the patient population presenting after sexual assault to two sites at an urban hospital system, and identify key factors in the patient, assault, acute care and follow-up characteristics that may be associated with better or worse engagement with assault-specific follow-up care. Approximately one-third of patients have documentation of receiving SA-related care within one year at a follow-up visit. This low rate is consistent with reported findings at other institutions. Various characteristics were investigated for correlation with higher or lower rates of follow-up attendance. Involvement of interdisciplinary acute care professionals—SANEs, social workers, and rape crisis counselors/patient advocates—did

not yield a significant effect on follow-up rates. However, patient age, assailant relationship to the patient, and substance-use at the time of assault, were identified as related factors.

Analyses were conducted to evaluate for differences in care and follow-up based on the age of the patient. Pediatric patients at this particular hospital system are routinely referred to a comprehensive sexual assault care clinic called the Child Sex Abuse Clinic which provides medical, forensic and social services in one sitting. The interdisciplinary team conduct interviews in one setting as to minimize re-traumatizing the survivor. Pediatric patients are more likely to be victims of assault by a family member, and therefore more likely to receive coordination services by a case manager at the Department of Children and Families. Comparative comprehensive clinical/social services and case coordination are absent for adult patients older than 19 years of age. This may largely account for the significantly lower rates of assault-related follow-up care in older patients.

There are several limitations of this study. First, the data is extracted from a specific EMR system called Epic. Though it is widely utilized by providers in the region, many providers use other systems or remain on paper documentation. We would not have access to this data and therefore may be under-reporting follow-up rates. Second, we used the ICD-10 code system which accounts for many but not all of the diagnoses and billing codes for the time frame captured in our data set. Therefore, we may be under-reporting the volume of patients presenting after sexual assault to these sites. For example, Planned Parenthood, a likely site for follow-up care after sexual assault, does not use Epic and none of these visits were captured. Lastly, extracting variables from medical record

review required several iterations of review to ensure uniform coding, given the general lack of standardization in documenting sexual assault cases. These iterations were reviewed by the research team to optimize for validity.

Future Direction

The process of compiling the data set illustrated the lack of standardization in documenting and keeping track of SA patients, presenting a challenge in studying this vulnerable population. We foresee several quality improvement initiatives to optimize the process of future study on the care of sexual assault patients, improve the quality of acute care, and increase compliance with follow up.

As discussed in the Methods section, compiling the data set required using two different searchable fields of the EMR in conjunction with one another: ICD codes (billing/diagnosis) as well as the EMR's "chief complaint" field. Though the overall volume of SA visits yielded by this final data set was consistent with a previous study published at this institution,[18] this study confirmed the need for standardization of documentation to allow for efficiency and efficacy of future studies. Billing and diagnosis codes such as ICD and SNOMED are commonly used to compile relevant patient data sets for clinical research. However, for medical conditions that are socially stigmatized, such as sexual assault, substance misuse, and psychiatric illnesses, providers may choose to use codes that are peripherally related in efforts to maintain privacy of the patient. For patients under the age of 26 years, billing codes are viewable to the parent or caretaker under whom the patient is covered for health insurance. For patients over the

age of 26 years, patients may prefer to keep such information private from partners or family with whom the patient is co-covered.

One option is to protocolize the use of a searchable field in the EMR that does not have the privacy implications of billing codes. In the case of our study, staff responsible for triaging patients upon presentation to the emergency departments (both YSC and SRC) initiate a patient encounter record in the EMR, which involves assigning a "chief complaint" to the visit. This field has a finite number of items from which to choose, and is purely for the purpose of clinical work flow and unrelated to billing. Without an existing protocol, 87% (n=409) of the captured sexual assault encounters in our data set utilized one of three chief complaints that includes the phrase "sexual assault". These include "Sexual Assault", "Sexual Assault Exam Referral", and "Possible Sexual Assault". Similar, but less specific, chief complaint items include "Assault Victim", "Dysuria", and "Medical Problem". Standardizing all emergency department encounters with concern of sexual assault to be assigned one of the three chief complaints that include the key phrase "sexual assault" would improve the efficacy of data set used in future research. This process is specific to patient encounters at the emergency departments and differs in the outpatient setting. At the two sites in our study, patients disclosing sexual assault during an outpatient visit are referred to the emergency department for forensic evidence collection, during which initial examination, testing, treatment, and appropriate referrals are made to Social Work, Department of Children and Families, law enforcement, and/or pediatric specialty clinics for sex abuse. Therefore, standardizing documentation of encounters to emergency departments would likely yield the widest net for data capture. While the assignment of the chief complaint

field approaches standardization, future studies should utilize this field in conjunction with diagnosis codes.

The findings of this study suggest rates of follow-up engagement may be improved with a standardized discharge protocol, involvement of a case coordinator for outpatient visits, and standardized documentation for outcomes research. Studying the care of the sexual assault patient will continue to require iterations of needs assessment and implementation of quality improvement strategies.

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