Original Research

An Investigation into a Large, Suburban, Academic Hospital's Sexual Assault Response Program

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Abstract

This study aims to profile sexual assault (SA) patients, their hospital encounters, and to identify resources necessary for effective management. It is a descriptive, retrospective chart review of all patients >18 who presented to the emergency department with a diagnosis of sexual assault or rape between January 1, 2015 and July 1, 2024. Demographics, hospital stay, and assault characteristics were extracted from patients' medical records. Odds ratios were calculated with logistic regression models. P-value of <0.05 was considered significant. 309 patients were included, majority of whom were female (89.0%), White (65.3%), and non-Hispanic (76.1%). Nearly all patients requested a SAFE exam (86.1%), and 10.5% left before arrival of the SAFE examiner. Law enforcement was involved in 43.0% of the cases. Many patients (37.5%) had pre-existing psychiatric comorbidity; 18.8% with depression and 7.1% with PTSD. Records showed 10.4% of assaults occurred in a group home, nursing facility, rehab facility, or shelter. Patients with psychiatric history had 0.40 times the crude odds of requesting a SAFE exam, and 0.38 times the crude odds of obtaining HIV testing compared to their counterparts. Patients with no known relationship with their assailant had 2.53 times adjusted odds of completing a sexual offense evidence kit compared to those with a known relationship with their assailant. This study highlights the importance of offering mental health resources and group/nursing home support from the emergency department (ED). This study illustrates focus areas for in-hospital interventions of SA-response programs and provides deeper understanding of SA patients for ED physicians.

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Sexual assault (SA) is broadly defined as any form of sexual contact or behavior that occurs without the explicit consent of the individual involved. This includes rape, unwanted sexual contact, or forcing a victim to perform sexual actions. SA also includes psychological manipulation and exploitation of individuals unable to consent (Morgan & Thompson, 2021). SA is a pervasive medical and public health crisis with an average of 463,634 cases reported annually in the United States (Morgan & Thompson, 2021). Of these, over 90% of victims identify as female, with the majority aged 18–34 years (*Sex Offenses and Offenders*, 1997). Approximately 52.2 million American women (43.6%) report experiencing some form of sexual violence in their lifetime (Smith et al., 2018). In New York, the reported incidence of rape is 33.9 cases per 100,000 inhabitants, though the true prevalence of SA as a whole is likely much higher due to underreporting (Crime in the United States, 2019; Rennison, 2002). Survivors of SA are at a significantly increased risk of long-term adverse outcomes, including suicidal ideation, substance abuse, mood and mental health disorders, and other chronic medical conditions (Clarke et al., 2023; Cucciare et al., 2022; Hassam et al., 2020; Khadr et al., 2018; Rothman et al., 2021; Ullman, 2016; Ullman et al., 2013).

Sexual assault accounts for over 55,000 visits to U.S. emergency departments (ED) each year (Smith et al., 2018). In 2024, the U.S. Department of Justice Office on Violence Against Women released the third edition of the National Protocol for Sexual Assault Medical Forensic Examinations for Adults and Adolescents, which presents guidelines for the initial evaluation of a patient presenting with sexual assault (A National Protocol for Sexual Assault Medical Forensic Examinations, 2024). This updated protocol emphasizes the need for patient-centered and trauma-informed care (TIC). It encourages providers to "adapt the examination process as needed to address the unique needs and circumstances of each patient based on the history the patient provides and how the patient presents." This approach acknowledges the profound psychological burden associated with navigating medical care following a significantly traumatic event.

The hospital program described in this study has had a robust Sexual Assault Forensic Examiner (SAFE) (formally known as SANE [Sexual Assault Nurse Examiner]) program since 2009 and is designated as a NYS Department of Health SAFE Center of Excellence for sexual assault and abuse (New York State Department of Health, n.d.). The hospital contracts with a multi-site program that provides on-call SAFE-certified registered nurses, nurse practitioners, and physician assistants. SAFEs are trained to conduct a full physical exam, collect forensic evidence, communicate with law enforcement, provide legal testimony, and determine post-exposure prophylaxis/treatment if necessary (Ciancone et al., 2000; Cole & Logan, 2008). It is estimated, however, that only 49% of EDs in the United States have access to SAFE resources, with 68% of hospitals reporting access to some sexual assault resources (Cowdery et al., 2024).

SAFE providers are often a victim's first, and sometimes only, contact with medical services immediately after SA, and therefore serve as a critical resource for survivors. In addition to conducting forensic exams, they serve as liaisons between law enforcement, further medical treatment, and mental health providers (Vogt et al., 2022). SAFE programs have proven their

effectiveness in securing thorough forensic exams, providing medical care, and addressing the psychological needs of patients (Derhammer et al., 2000; Ericksen et al., 2002; Ledray & Simmelink, 1997). SAFEs have been associated with increased uptake and usage of testing, infection and pregnancy prophylaxis, and resource utilization after an assault compared to patients who did not have a SAFE interaction (Hollender et al., 2023). The protocol for SAFE exams is detailed in the National Protocol for Sexual Assault Medical Forensic Examinations for Adults and Adolescents (A National Protocol for Sexual Assault Medical Forensic Examinations, 2024). At our institution, the on-call SAFE is consulted whenever a patient presents to the ED with primary complaint of SA. Response times vary depending on whether the SAFE is with another patient, at another hospital, or readily available. Patients always have the right to decline a SAFE exam, as well as the right to leave prior to the SAFE arriving. Many hospitals, including our own, have Rape Crisis Counselors, part of the community Sexual Assault Response Team (SART), to bridge the gap until the SAFE arrives. They remain with the patient during the exam as emotional support and can connect them with outpatient counseling and resources. ED physicians, residents, students, and ED nurses do not perform SAFE exams at our institution due to the specialized training and certification required.

SAFE exams can include HIV testing and/or prophylaxis, STD testing and/or prophylaxis, toxicology screening for drug-facilitated sexual assault, pregnancy testing, pregnancy prophylaxis if requested, photo documentation of injury, as well as completion of the evidence collection kit with medical forensic documentation. Patients may decline or terminate any or all parts of the exam or subsequent treatment. Patients may also choose to have evidence collected but not reported to law enforcement, in which case it is stored in a state-wide facility for up to 20 years, during which the patient retains the right to report the crime and have the evidence evaluated. At the conclusion of the exam the patient has the choice to bill their personal insurance or the Office of Victims Services for the emergency room encounter, medications, and labs.

Victims of SA are an often underserved and understudied patient population. SAFEs have introduced a focused component of care to these patients who may have increased psychosocial, emotional, and physical care needs compared to other patients in the ED. This study aims to profile the demographics of these patients, the resources and tests that they require, and the circumstances of their assaults. This study identifies two exposures of interest—those with previous psychiatric illnesses and those with a known assailant—and aims to showcase how these exposures may impact treatment acceptance and resource utilization. Understanding where these patients present from and what they require in the hospital can help hospitals designate funding, resources, and further research to these areas of need. This study also hopes to identify vulnerable populations that may be at greatest risk for negative outcomes. We hope to showcase commonalities among these patients and to suggest targeted prevention and intervention efforts to improve the clinical treatment and management of SA patients.

Methods

This was a retrospective chart review study that examined the medical records of individuals who presented to the ED of a large, suburban, academic hospital in the Northeastern United States between January 1, 2015 and June 1, 2024. This study was designated Not Human Subjects Research by our Institutional Review Board. All individuals who presented to the ED with ICD-10 codes of Z04.41 (Encounter for examination and observation following alleged adult rape), T74.21 (Adult sexual abuse, confirmed), or T76.21 (Adult sexual abuse, suspected) were screened via electronic health record (EHR) review for inclusion. These ICD-10 codes are

assigned by the ED provider, and there is no independent identifier for patients who received a SAFE exam. Patients determined via chart review to have an erroneous diagnosis code of above (i.e. no mention of a sexual assault or abuse in notes) and those under the age of 18 were excluded.

Data Abstraction

Two authors, AC and HA, completed all data screening, collection, and analysis. Charts were first reviewed with both authors for consistency, and the rest of the data collection was split between authors, with any discrepancies reviewed by both authors. Data were collected from nursing notes, physician notes, social work/case management notes, and the SAFE notes/paperwork within the patient's electronic medical record, where available. Not all patients had a SAFE exam, and of those with a SAFE exam, not all had notes/paperwork scanned into their EHR. SAFE notes were present in the EHR based on the patient's involvement with law enforcement and current status of any investigation. Therefore, in many patients, the only information available to us were from ED staff notes, which varied in their content and detail based on the provider, date, time, and patient status. Missing data were coded as "missing," while information a patient could not provide was coded as "unknown to patient."

Demographic data, including age, patient-reported gender identity, race, ethnicity, insurance status, smoking status, alcohol use, drug use, and sexual activity, were collected from the medical chart. Comorbidities, including psychiatric diagnoses and prior history of sexual assault or abuse were collected.

Characteristics of the hospital stay and treatment provided were extracted from hospital records, including year of visit, time of visit, whether the SAFE nurse was requested by patient, if the patient left prior to SAFE arrival, whether the sexual assault evidence kit was collected, HIV testing and/or prophylaxis, STD testing and/or prophylaxis, urine toxicology, urine pregnancy testing, pregnancy prophylaxis, if follow-up care was scheduled, and involvement of law enforcement.

Assault characteristics were collected from the patient report in EHR. This included location of assault, relationship with assailant, sex of assailant, traumatic injury associated with assault, penetration type, drug facilitation of assault, awake or regained consciousness during assault, and whether the patient recalled events of assault. Additionally, SA as primary complaint, SA within 96 hours of presentation to ED, consent to evidence collection, and patient with capacity to consent to SAFE exam were collected from SAFE documentation. Variables are further defined in Appendix A.

Cohort Exposure Variables

For the comparative analysis, two exposure categories were evaluated, psychiatric history (yes vs. no), and relationship to assailant (known vs. stranger).

Primary Outcomes

Outcomes of interest for comparative analysis were: SAFE evaluation requested, sexual evidence kit collected, HIV testing ordered, and law enforcement involvement.

Data Analysis

Statistical data were analyzed using SPSS version 29.0.0.0 (Chicago, IL) and R Studio version 1.4.1717 (Boston, MA). A descriptive analysis with the entire patient population was first conducted. Categorical data were summarized with number and percent, and continuous data were summarized with median and interquartile range (IQR). For comparison of baseline characteristics between exposure groups, Chi-squared testing was used to compare groups of categorical variables and t-test of Wilcoxon rank sum was used to compare continuous variables. Unadjusted associations between each exposure and each outcome were completed to estimate crude odds ratios (OR). Potential confounders were identified a priori and were chosen by clinical significance and existing literature. Confounders chosen were age, sex, race, ethnicity, and insurance status. Multivariate binary logistic regression models were run with potential confounders and each outcome, OR and 95% confidence interval were reported. Missing variables were not included in analyses. Two-tailed significance was defined as $p < 0.05$.

Results

Descriptive Analysis

As shown in Appendix B, 309 patients (median age 27 years [22–37], 89.0% female) were identified from January 1, 2015, to July 31, 2024. The largest age group, when stratified, was 18–24 years old (n=127, 41.1%). The majority of patients were female (89.0%), White (65.3%), and non-Hispanic (76.1%). In 41.3% of patients, there was no known or described medical history or comorbidities, inclusive of psychiatric illness history. Further, 36.6% had a documented psychiatric illness history, with 18.8% having pre-existing depression, 6.8% with pre-existing PTSD. A neurodevelopmental disorder, including developmental delay, was present in 12.6% of patients. Of those with a known sexual activity status (25.9%), 76.3% were previously sexually active. In all, 14.9% had previous documented sexual assault or trauma. The majority of patients (74.8%) utilized special billing procedures as a payment method for this encounter and treatment, and 19.1% used federal/state provided insurance (Medicaid and/or Medicare).

The majority of patients (91.6%) presented to the ED with a documented chief complaint pertaining to SA or rape, found in Appendix C. All but one patient (99.7%) was captured under the T76.21 code for suspected sexual abuse, with one patient noted under T74.21 code for confirmed sexual abuse. The number of annual ED presentations remained fairly constant between 2020–2023 (24–36 visits), and the first half of 2024 had only six presentations. Most ED presentations occurred between 12:00–17:59 (35.3%) and 18:00–23:59 (30.4%). A total of 86.7% of patients had SAFE examinations requested either by the patient or by the medical staff on their behalf. Of those, 92.5% of patients were evaluated by SAFE examiner. Evidence kits were collected (via SAFE practitioner) from 42.0% of patients, and 43.0% connected with law enforcement while in the ED for their assault. Most patients received HIV testing (74.8%) and a urine pregnancy test (80.5%). Additionally, a third of patients (34.3%) underwent other STI testing, including for *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, *Treponema pallidum*, and hepatitis (A, B, C). Many patients were given STI prophylaxis/treatment (55.3%), including the standard post-exposure prophylaxis regimens for *C. trachomatis*, *N. gonorrhoeae*, hepatitis (A, B, C), and HIV. A urine toxicology was done on 23.3% of patients, and 27.1% of patients received emergency contraception.

Only 19.1% of patients reported no known relationship with the assailant, whereas 42.1% identified a previous relationship, further demonstrated in Appendix D. A total of 19.4% of the patients identified the assailant as a friend or acquaintance and 11.7% as a current or former

partner. Of those with a known assailant, 1.1% of assailants were female, 88.9% were male, and 10.0% identified multiple individuals (of potentially different sexes). About a quarter (25.6%) of patients believed their assault may have involved involuntary drug or alcohol administration, and 53% of patients denied memory or awareness of the SA event. Traumatic injury was noted in 27.8% of medical records. For those who it was explicitly noted in their chart, 90% of assaults contained some form of penetration, 12.9% noted digital penetration, 3.0% involved an object, and 70.5% with penile penetration. Of the assaults, 10.4% occurred in institutional settings (group homes, hospitals, residential, nursing, and rehabilitation facilities); 14.2% occurred at a family, friend, or assailant's house, with another 10.4% occurring in the patient's home.

Comparative Cohort Analysis

Relationship with Assailant Cohort

This comparison was conducted between patients with a known relationship with their assailant ($n = 130$), further referred to as "known", and those with no known relationship with their assailant ($n = 59$), referred to as "stranger". Baseline characteristics between groups were similar, with the exception of a higher prevalence of neurodevelopmental disorders in the known group compared to the stranger group (18.5% vs. 6.8%, $p = 0.046$), as shown in Table 1. Table 2 displays characteristics of assault. In the known group, the most common places of assault were group home/nursing facility/rehab/hospital (23.8%, $p < 0.001$), other house not belonging to patient (31.4%, $p = 0.01$), and the patient's home (13.3%). The stranger group had the highest proportion of assaults occurring in a public location (36.7% vs. 10.5%, $p < 0.001$). The majority of assailants in the known group were identified as acquaintance (46.2%) or current or ex-partner (27.7%). Both groups had high proportions of male assailants (77.7% vs. 64.4%), and there were no significant differences in the penetration type in both groups. A higher proportion of patients in the known group were awake during the assault and recalled the events of the assault (63.1% vs. 42.4%, and 66.2% vs. 49.2%, respectively, both $p \leq 0.01$). Drug facilitation for their assault was reported in 39.0% of patients in the stranger group, compared to 23.8% of patients in the known group ($p = 0.02$). Outcomes and treatment, described in Table 3, were similar across both groups with the exception of the sexual offense evidence kit being collected more often in the stranger group (56.9% vs. 33.3%, $p = 0.01$).

Univariate models evaluated predictors of interest with each outcome of interest, displayed in Table 4. Patients in the stranger group had 3.39 times the crude odds of having a sexual offense evidence kit collected (95% *CI* 1.56-7.35, $p = 0.002$) compared to those in the known group. Stranger as an assailant did not predict any other outcomes in crude models. Multivariate models adjusted for age, race, ethnicity, and encounter payment method. Having no known relationship with the assailant remained a significant predictor [2.53 (1.02-6.28), $p = 0.05$] of sexual offense evidence kit collection after adjusting for other predictors. This was not a predictor in other multivariate models.

Table 1

Demographic Characteristics by Exposure Cohort

	Known relationship with assailant (n = 130)	No known relationship with assailant/stranger (n = 59)	p-value	No known previous psychiatric history (n = 192)	Known previous psychiatric history (n = 113)	p-value
Age, median (IQR)	28.0 (22.0-36.8)	29.0 (21.0-42.0)	0.90	25 (21-34)	31 (23-42)	**0.04**
Female sex, n (%)	109 (83.8)	54 (91.5)	0.18	173 (90.1)	100 (88.5)	0.70
Male sex	21 (16.2)	5 (8.5)		19 (9.9)	13 (11.5)	
Race			0.18			0.10
Asian	1 (0.8)	2 (3.4)	0.20	5 (2.6)	0 (0.0)	**0.04**
Black/African American	18 (13.8)	3 (5.1)	0.13	19 (10.0)	16 (14.2)	0.47
Caucasian	89 (68.5)	40 (67.8)	0.29	117 (61.6)	83 (73.5)	0.47
Other	8 (6.2)	2 (3.4)	0.73	15 (7.9)	8 (7.1)	0.38
Missing	14 (10.8)	12 (20.3)		34 (17.9)	6 (5.3)	
Hispanic ethnicity			0.32			0.37
Hispanic	5 (3.8)	0 (0.0)		8 (4.2)	4 (3.5)	
Non-Hispanic	104 (80.0)	45 (76.3)		139 (72.4)	95 (84.1)	
Missing	21 (16.2)	14 (23.7)		45 (23.4)	14 (12.4)	
Encounter payment method			0.56			**<0.001**
Private insurance	5 (3.8)	1 (1.7)	0.67	7 (3.6)	4 (3.5)	1.00
Medicaid	25 (19.2)	5 (8.5)	0.08	18 (9.4)	27 (23.9)	**<0.001**
Medicare	11 (8.5)	1 (1.7)	0.11	4 (2.1)	9 (8.0)	**0.02**
Self-Pay	1 (0.8)	0 (0.0)	1.00	2 (1.0)	1 (0.9)	1.00
Special billing	86 (66.2)	50 (84.7)	**0.004**	159 (82.8)	70 (61.9)	**<0.001**
Missing	2 (1.5)	2 (3.4)		2 (1.0)	2 (1.8)	
Sexually active	26 (20.0)	13 (22.4)	1.00	45 (23.4)	16 (14.4)	**0.02**
Missing	96 (73.8)	42 (72.4)		139 (72.4)	84 (75.7)	
History of previous sexual assault, sexual trauma or rape	28 (21.9)	6 (10.2)	0.06	14 (7.3)	32 (28.6)	**<0.001**

Psychiatric History

Cohorts were evaluated by exposure of known psychiatric history, "psychiatric history" group (*n* = 113), compared to those with no known psychiatric history, referred to as "non-psychiatric history" group (*n* = 192). Individuals in the non-psychiatric history group had a significantly lower median age of 25 (21–34) versus 31 (23–42, *p* = 0.04), as displayed in Table 1. There was a statistically significant difference in the distribution of racial categories between groups (*p* = 0.04), but no significant differences by each racial category. Individuals in the psychiatric history group had higher proportions of Medicaid payment (23.9% vs. 9.4%, *p* = 0.01) and Medicare payment (8.0% vs. 2.1%, p = 0.04), and a lower use of special billing (61.9% vs. 82.8%, *p* = 0.002). Patients with a psychiatric history had a lower prevalence of being sexually active (14.4% vs. 23.4%, *p* = 0.02), but higher reported rates of previous sexual assault (28.6% vs. 7.3%), medical comorbidities (56.3% vs. 31.8%), and neurodevelopmental disorders (23.9% vs. 6.3%, all *p* < 0.001). There was a similar spread of location of assault between groups as well as relationship with assailant, displayed further in Table 2. A higher proportion of patients with a psychiatric history reported being awake during their assault, recalling the events of their assault

(both p<0.001). Fewer patients (86.7% vs. 95.3%, *p* = 0.03) had SA as their chief complaint for their visit in the psychiatric history group.

Table 2

Assault Characteristics by Exposure Cohort

	Known relationship with assailant (n = 130)	No known relationship with assailant/stranger (n = 59)	p-value	No known previous psychiatric history (n = 192)	Known previous psychiatric history (n = 113)	p-value
Location of assault						
Car	5 (4.8)	5 (10.2)	0.29	9 (8.0)	3 (3.5)	0.24
Patient's home	14 (13.3)	6 (12.2)	1.00	17 (15.0)	15 (17.4)	0.70
Group home/Nursing facility/Rehab/Hospital	25 (23.8)	0 (0.0)	**<0.001**	11 (9.7)	21 (24.4)	**0.01**
Other house (not patient's)	33 (31.4)	6 (12.2)	**0.01**	23 (20.4)	21 (24.4)	0.50
Hotel	7 (6.7)	6 (12.2)	0.35	15 (13.3)	2 (2.3)	**0.01**
Party	3 (2.9)	4 (8.2)	0.21	8 (7.1)	4 (4.7)	0.56
Public location (not otherwise specified)	11 (10.5)	18 (36.7)	**<0.001**	22 (19.5)	14 (16.3)	0.58
School Campus	3 (2.9)	4 (8.2)	0.21	5 (4.4)	3 (3.5)	1.00
Shelter/Jail	4 (3.8)	0 (0.0)	0.31	3 (2.7)	3 (3.5)	1.00
Missing	25 (19.2)	9 (15.5)		79 (41.1)	27 (23.9)	
Relationship with Assailant						
Acquaintance/Friend	60 (46.2)	-	-	34 (31.8)	26 (31.7)	1.00
Current or Former partner	36 (27.7)	-	-	21 (19.6)	15 (18.3)	0.85
Caregiver or Facility staff member	13 (10.0)	-	-	6 (5.6)	8 (8.5)	0.56
Doctor	2 (1.5)	-	-	1 (0.9)	1 (1.2)	1.00
Family member	5 (3.8)	-	-	1 (0.9)	4 (4.9)	0.17
Landlord	2 (1.5)	-	-	0 (0.0)	2 (2.4)	0.19
Law enforcement officer	3 (2.3)	-	-	2 (1.9)	1 (1.2)	1.00
Neighbor/Fellow group home member	9 (6.9)	-	-	3 (2.8)	6 (7.3)	0.18
No Relationship/Stranger	-	59 (100.0)	-	39 (36.4)	20 (24.4)	0.08
Missing				85 (44.3)	31 (27.4)	
Sex of assailant						
Female	2 (1.1)	0 (0.0)	1.00	0 (0.0)	2 (1.8)	0.16
Male	101 (77.7)	38 (64.4)	0.59	101 (53.2)	68 (60.2)	1.00
Multiple individuals	10 (7.7)	6 (10.2)	0.39	13 (11.4)	6 (7.9)	0.47
Missing	17 (13.1)	15 (25.4)		78 (40.6)	37 (32.7)	
Traumatic injury with assault	32 (25.0)	17 (29.8)	0.59	57 (30.5)	29 (26.6)	0.60
Penetration Type						
None	10 (7.9)	2 (3.4)	0.51	5 (6.9)	7 (13.0)	0.36
Fingers/Hand	7 (5.6)	5 (8.6)	0.30	11 (15.3)	6 (11.1)	0.60
Object	2 (1.6)	2 (3.4)	0.29	2 (2.8)	2 (3.7)	1.0
Penis	58 (46.0)	19 (32.8)	0.46	54 (75.0)	39 (72.2)	0.84
Missing	49 (38.9)	30 (51.7)		117 (61.9)	56 (50.9)	
Drug facilitation of assault	31 (23.8)	23 (39.0)	**0.02**	52 (27.2)	27 (23.9)	0.16
Missing	9 (6.9)	7 (11.9)		53 (27.7)	21 (18.6)	
Awake or regained consciousness during assault	82 (63.1)	25 (42.4)	**0.004**	66 (34.4)	65 (57.5)	**<0.001**
Missing	6 (4.6)	1 (1.7)		34 (17.7)	9 (8.0)	
Recalled events of the assault	86 (66.2)	29 (49.2)	**0.01**	70 (36.5)	69 (61.1)	**<0.001**
Missing	6 (4.6)	1 (1.7)		35 (18.2)	9 (8.0)	
Sexual assault as chief complaint	124 (95.4)	55 (93.2)	0.51	183 (95.3)	98 (86.7)	**0.03**
Patient consents to evidence collection	88 (67.7)	45 (76.3)	0.23	176 (91.7)	98 (86.7)	0.14

	Known relationship with assailant (n = 130)	No known relationship with assailant/stranger (n = 59)	p-value	No known previous psychiatric history (n = 192)	Known previous psychiatric history (n = 113)	p-value
Sexual assault occurred with 96 hours	122 (93.8)	57 (96.6)	0.72	184 (95.8)	104 (92.0)	0.15
Patient with capacity to consent to SAFE exam	110 (83.1)	59 (100.0)	**<0.001**	176 (91.7)	98 (86.7)	0.14

Treatment accepted and outcome variable varied significantly by psychiatric history status (Table 3). Psychiatric history patients were significantly less likely to request a SAFE exam (80.5% vs. 91.1%, $p = 0.01$) and HIV testing (67.3% vs. 79.7%, $p = 0.002$), but more likely to have urine toxicology and STI/STD testing ordered during their presentation (all $p \leq 0.02$). A lower proportion of patients with a psychiatric history also had STI prophylaxis or treatment (46.4% vs. 60.9%, $p = 0.02$) and emergency contraception ordered (19.6% vs. 32.3%, $p = 0.03$).

Univariate models showed those with a psychiatric history had crude odds of 0.40 (0.20-0.80, $p = 0.01$) times those without a psychiatric history of requesting a SAFE evaluation (Table 4). Individuals with a psychiatric history also had 0.38 (0.20-0.70, $p = 0.002$) the odds of having HIV testing ordered compared to those without a psychiatric history. Psychiatric history did not predict any other outcomes in the crude models. Though psychiatric history was no longer a significant predictor of any outcomes of interest in multivariate models, it did trend toward a significant impact on HIV testing ordered [0.50 (0.24-1.04), $p = 0.06$].

Table 3

Outcome and Treatment Variables by Exposure Cohort

	Known relationship with assailant (n = 130)	No known relationship with assailant/stranger (n = 59)	p-value	No known previous psychiatric history (n = 192)	Known previous psychiatric history (n = 113)	p-value
SAFE evaluation requested	110 (84.6)	54 (91.5)	0.25	175 (91.1)	91 (80.5)	**0.01**
Patient left prior to SAFE arrival	11(9.8)	3 (5.4)	0.39	21 (11.8)	6 (6.4)	0.20
Sexual offense evidence kit collected	43 (33.3)	33 (56.9)	**0.01**	79 (55.6)	48 (56.5)	1.00
HIV testing ordered	89 (68.5)	46 (78.0)	0.70	153 (79.7)	76 (67.3)	**0.002**
Not offered*	14 (10.8)	2 (3.4)		17 (8.9)	8 (7.1)	
Urine pregnancy testing ordered	102 (78.5)	49 (84.5)	0.43	161 (83.9)	88 (78.6)	0.28
Urine toxicology ordered	28 (21.5)	18 (31.0)	0.20	32 (16.7)	38 (33.9)	**<0.001**
STI/STD testing ordered	49 (37.7)	22 (37.9)	1.00	57 (29.7)	48 (42.9)	**0.02**
Any STI prophylaxis/treatment ordered	67 (51.5)	37 (63.8)	0.15	117 (60.9)	52 (46.4)	**0.02**
Emergency contraception ordered *	27 (23.2)	17 (31.5)	0.27	62 (32.3)	22 (19.6)	**0.03**
Law enforcement involvement	62 (48.1)	26 (44.8)	0.75	74 (38.9)	54 (48.6)	0.12
Social Work Involvement	37 (28.9)	9 (15.5)	0.07	53 (20.3)	12 (30.8)	0.15
Follow-up scheduled	16 (12.4)	10 (17.2)	0.37	22 (11.6)	14 (12.6)	0.86

*Not offered to those who presented outside 72-hour window for post-exposure prophylaxis. As such not included in analysis

**Not offered to those with confirmed positive urine pregnancy test or male sex. As such not included in analysis

Table 4

Univariate and multivariate models by exposure cohorts

| Outcome | Independent Variable | Univariate Model | | Multivariate Model | | | |
| | | | | Relationship with assailant | | Known psychiatric history | |
		OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
SAFE evaluation requested	*Full Model*	-	-	-	**<0.001**		**<0.001**
SAFE Evaluation Requested	Relationship		0.20		0.75		
	Known relationship	1.00		1.00			
	No known relationship	1.96 (0.70-5.52)		0.82 (0.24-2.76)			
	Psychiatric history		**0.01**				0.57
	No known psychiatric history	1.00		-		1.00	
	Known psychiatric history	0.40 (0.20-0.80)		-		0.77 (0.32-1.87)	
	Age	1.00 (0.98-1.03)	0.94	1.02 (0.97-1.07)	0.46	1.01 (0.98-1.05)	0.49
	Race		0.37		0.35		0.59
	White	1.00		1.00		1.00	
	Asian	-	-	-	-	-	-
	Black/African American	0.46 (0.20-1.09)	0.08	0.29 (0.07-1.11)	0.07	0.44 (0.14-1.41)	0.16
	Other	0.73 (0.23-2.32)	0.60	-	-	-	-
	Hispanic ethnicity		0.48	*	*	*	*
	Non-Hispanic	1.00		-		-	
	Hispanic	2.10 (0.27-16.7)		-		-	
	Encounter payment method		**<0.001**		**<0.001**		**<0.001**
	Private insurance	1.00		1.00		1.00	
	Medicaid	1.56 (0.42-5.85)	0.51	0.94 (0.14-6.39)	0.95	1.68 (0.42-6.74)	0.46
	Medicare	4.00 (0.69-23.1)	0.12	1.68 (0.15-18.7)	0.67	4.78 (0.60-38.2)	0.14
	Self-Pay	0.40 (0.03-5.15)	0.48	-		1.19 (0.06-25.5)	0.91
	Special billing	29.6 (7.59-115.5)	**<0.001**	9.69 (1.39-67.4)	**0.02**	26.6 (6.49-109.3)	**<0.001**
Sexual offense evidence kit collection	*Full Model*	-	**-**	-	**0.002**	-	**<0.001**
Sexual Offense Evidence Kit Collection	Relationship		**0.002**		**0.05**		
	Known relationship	1.00		1.00			
	No known relationship	3.39 (1.56-7.35)		2.53 (1.02-6.28)			
	Psychiatric history		0.90				0.06
	No known psychiatric history	1.00		-		1.00	
	Known psychiatric history	1.04 (0.60-1.78)		-		1.99 (0.97-4.10)	
	Age	0.99 (0.97-1.01)	0.39	1.00 (0.97-1.04)	0.79	1.00 (0.97-1.02)	0.89
	Race		0.21		0.29		0.53
	White	1.00		1.00		1.00	
	Asian	1.89 (0.34-10.7)	0.47	-	-	1.11 (0.17-7.15)	0.91
	Black/African American	0.68 (0.31-1.50)	0.33	0.25 (0.06-1.02)	0.05	0.48 (0.18-1.29)	0.14
	Other	2.46 (0.84-7.26)	0.10	-	-	-	-
	Hispanic ethnicity		**0.045**	*	*	*	*
	Non-Hispanic	1.00		-		-	
	Hispanic	8.57 (1.05-70.0)		-		-	
	Encounter payment method	*	*		0.45		**0.003**
	Private insurance	-		1.00		1.00	
	Medicaid	-	-	-	-	-	-

| Outcome | Independent Variable | Univariate Model | | Multivariate Model | | | |
| | | | | Relationship with assailant | | Known psychiatric history | |
		OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
	Medicare	-	-	-	-	-	-
	Self-Pay	-	-	-	-	-	-
	Special billing	-	-	-	-	-	-
HIV testing ordered	*Full Model*	-	-	-	0.12	-	**0.002**
HIV Testing Ordered	Relationship		0.55		0.92		
	Known relationship	1.00		1.00			
	No known relationship	1.27 (0.58-2.79)		1.05 (0.41-2.65)			
	Psychiatric history		**0.002**				0.06
	No known psychiatric history	1.00		-		1.00	
	Known psychiatric history	0.38 (0.20-0.70)		-		0.50 (0.24-1.04)	
	Age	0.97 (0.95-0.99)	**0.01**	0.98 (0.95-1.01)	0.16	0.98 (0.95-1.00)	0.08
	Race		0.92		0.59		0.68
	White	1.00		1.00		1.00	
	Asian	-		-		-	
	Black/African American	0.74 (0.31-1.79)	0.51	0.42 (0.13-1.42)	0.16	0.53 (0.19-1.47)	0.22
	Other	1.07 (0.34-3.37)	0.91	-	-	1.15 (0.01-108.8)	0.95
	Hispanic ethnicity		0.87	*	*		0.97
	Non-Hispanic	1.00		-		1.00	
	Hispanic	1.14 (0.24-5.46)		-		0.93 (0.01-86.2)	
	Encounter payment method		**<0.001**		**0.03**		**0.02**
	Private insurance	1.00		1.00		1.00	
	Medicaid	0.37 (0.07-2.07)	0.26	0.70 (0.09-5.29)	0.73	0.40 (0.06-2.52)	0.33
	Medicare	1.67 (0.12-24.3)	0.71	3.79 (0.21-68.8)	0.37	2.64 (0.16-44.9)	0.50
	Self-Pay	0.67 (0.04-11.9)	0.78	-	-	-	-
	Special billing	2.16 (0.42-11.2)	0.36	2.92 (0.44-19.6)	0.27	1.63 (0.29-9.32)	0.58
Law enforcement involvement	*Full Model*	-	-	-	0.20		**0.01**
Law Enforcement Involvement	Relationship		0.55		0.31		
	Known relationship	1.00		1.00			
	No known relationship	1.27 (0.58-2.79)		1.48 (0.70-3.13)			
	Psychiatric history		0.31				0.21
	No known psychiatric history	1.00		-		1.00	
	Known psychiatric history	0.91 (0.77-1.09)		-		1.43 (0.81-2.52)	
	Age	1.02 (1.00-1.04)	**0.04**	1.02 (0.99-1.05)	0.19	1.01 (0.99-1.04)	0.20
	Race		0.26		0.93		0.11
	White	1.00		1.00		1.00	
	Asian	1.68 (0.37-7.71)	0.50	2.22 (0.19-26.2)	0.53	3.76 (0.65-21.6)	0.14
	Black/African American	0.63 (0.30-1.33)	0.23	1.12 (0.39-3.22)	0.83	0.79 (0.34-1.84)	0.59
	Other	0.47 (0.18-1.26)	0.13	-	-	0.06 (0.00-1.21)	0.07
	Hispanic ethnicity		0.22	*	*		0.53
	Non-Hispanic	1.00		-		1.00	
	Hispanic	0.43 (0.11-1.64)		-		2.28 (0.17-29.9)	
	Encounter payment method		0.11		0.50		0.30
	Private insurance	1.00		1.00		1.00	
	Medicaid	2.44 (0.58-10.4)	0.23	2.06 (0.31-13.8)	0.46	2.32 (0.53-10.2)	0.27
	Medicare	8.89 (1.40-56.6)	**0.02**	7.21 (0.70-74.5)	0.10	7.99 (1.09-58.6)	**0.04**
	Self-Pay	-	-	-	-	-	-
	Special billing	1.75 (0.45-6.78)	0.42	1.79 (0.30-10.6)	0.52	1.82 (0.46-7.19)	0.39

Not included due to non-convergence.

Discussion

This large cohort study characterizes patients presenting for sexual assault care at a suburban, academic emergency department. Our findings provide insight into key factors that may affect these patients' experiences and needs following an assault. In particular, the study highlights the prevalence of co-occurring psychiatric conditions, residence in group or nursing homes, and suspected substance-facilitated assaults. A clearer understanding of the characteristics of patients presenting for sexual assault and rape can help healthcare systems more effectively address their medical, psychological, and social needs.

About 10% of assaults took place in nursing and group homes, raising critical concerns related to the rights and safety of disabled and elderly populations. Previous research has documented significantly increased incidence of sexual assault in disabled populations compared to their non-disabled counterparts, and our study supported these findings (Lee et al., 2019; Sobsey & Doe, 1991). A qualitative study suggests that physician education on sexuality, consent, and rights to their disabled patients can improve their ability to ask for help and call abuse to attention (Schmidt et al., 2022). While several screening tools for elder abuse exist, few have undergone rigorous multi-center validation and are therefore underutilized (Mercier et al., 2020). Some interventions for post-abuse care management, particularly for elders, have been suggested. One intervention is the Vulnerable Elder Protection Team (VEPT), which provides a 24/7 on-call team for elder abuse cases, facilitating safe discharge planning and appropriate housing transitions (Rosen et al., 2018). In two years, 39% of participants in the VEPT program were discharged to safer housing (Rosen et al., 2022). Hospitals should consider adopting similar programs for all vulnerable persons lacking safe post-discharge options to ensure comprehensive safe care.

The ICD-10 codes in this study demonstrated that 99.7% of patients were coded under T76.21 (Adult sexual abuse, suspected), with only one patient coded as T74.21 (Adult sexual abuse, confirmed). This suggests that providers prefer the "suspected" designation, possibly due to concerns about liability, stigma, or uncertainty in confirming the assault. A national database study of ED visits found that 52% of SA visits were coded as suspected and 48% as confirmed (Murugan et al., 2021). While the ICD-10 system introduced suspected and confirmed categories to facilitate better reporting of SA, our results suggest possible unintended consequences (Medel-Herrero et al., 2023). Provider's preference for the suspected code may inadvertently invalidate patients' experiences, particularly as only 1–2% of cases are estimated to involve false allegations (Lonsway, 2010). Few other ICD-10 codes include both the suspected and confirmed modifiers, including other non-sexual types of assault such as Y04: Assault by bodily force. Though a provider's ability to document unreported SA is important, the stigma associated with SA may be pushing providers to classify all presentations as suspected and may also impact patients' internalized stigma (Chalmers et al., 2023). The American College of Emergency Physicians guidelines recommend avoiding stigmatizing modifiers such as "alleged" or "suspected" when documenting SA in medical charts (Evaluation and Management of the Sexually Assaulted or Sexually Abused Patient, 2013). Hospitals should establish clear protocols for ICD-10 coding in SA cases to ensure accurate documentation and validate patients' experiences. Additionally, these codes captured only an estimated one-third of the patients who received a SAFE exam, further supporting the underdiagnosis and underreporting of sexual assault in medical charting.

Our study also highlighted the many factors that impact law enforcement involvement and evidence collection, including knowledge of the assailant, history of SA, and potential drugging

involvement in the assault. Less than 45% of our study population had initial law enforcement involvement or evidence collected, and it is likely that an even smaller percentage of that group continued to pursue further legal action (Morgan & Thompson, 2021). A large mediation analysis found that SAFE involvement was correlated not only with increased police involvement and SAFE evidence collection, but also additional non-SAFE evidence collection by police, which was further associated with case referral (Campbell et al., 2012). While engagement with law enforcement can be essential for legal recourse, it may also impose emotional and psychological burdens on survivors. Emergency department providers should maintain a neutral stance, offering support that empowers patients to make informed decisions regarding law enforcement involvement, while prioritizing their physical and emotional well-being.

Our study also revealed potential gaps in ED staff training on TIC, evidenced by gaps in sensitive information collected from patients, such as 74% of patients in this study not being asked and/or recorded if they are previously sexually active by ED providers. A study found that 36% of domestic violence patients would only divulge sensitive information if directly asked about it, potentially describing the reason behind large number of unknowns in our study, particularly for sensitive information (i.e. history of SA) (Hayden et al., 1997). Treating SA requires a nuanced approach that integrates medical, psychological, and social considerations and TIC is the most evidence-based practice for this (Tepper et al., 2022). TIC, as defined by the National Institute of Health (NIH), involves recognizing the widespread impact of trauma, understanding its effects, applying trauma-informed principles to practice, and preventing re-traumatization (Marsac et al., 2016). These principles can help providers ensure better psychological outcomes for their patients in the immediate aftermath of a traumatic incident (Fiske et al., 2021; Forkey et al., 2021). It is possible that providers are not fully comfortable with providing TIC and therefore avoid sensitive or potentially triggering topics when interviewing their patients for these concerns. Offering TIC training to ED providers and hosting informal conversations on the importance of TIC may offer a more thorough and safer exam for patients prior to SAFE arrival (Morra et al., 2024). Additionally, simply the act of having a SAFE presence is likely to positively impact TIC behaviors by other ED staff, adding to a culture of normalization of TIC (Chalmers et al., 2023). One study has found that current ED providers may be resistant to this change (Bruce et al., 2018), but since this study, our hospital has recently begun piloting TIC and SA-specific TIC training programs with medical students and residents to develop the next generation of physicians who see TIC as the standard of care for all patients.

Mental health conditions were more prevalent in our study population (37.5%) compared to the general U.S. population (23.1%) (Key Substance Use and Mental Health Indicators in the United States: Results from the 2022 National Survey on Drug Use and Health, 2023). It is well documented that individuals who experience sexual assault are at an increased risk of developing PTSD, depression, and anxiety (Clarke et al., 2023; Khadr et al., 2018; Rothman et al., 2021). However, preexisting mental illnesses may not only predispose these patients to assault, but also exacerbate the psychological sequelae after an assault. Our analysis found a significant association between preexisting mental illness and declination of SAFE services and other testing modalities, raising concern about post-assault care engagement. It is possible that these patients experience heightened feelings of shame, guilt, and fear after an assault which therefore deters them from engaging in care and forensic evaluation. Additionally, severe symptoms of their illnesses, including cognitive dissociation or distortions, may cloud their ability to advocate for themselves in an acute-care setting.

Patient engagement with SAFE programs has been shown to significantly improve outcomes for survivors (Ericksen et al., 2002). However, patients with preexisting psychiatric conditions, who are already at high risk for adverse outcomes, may demonstrate reduced engagement with SAFE services. This reduced engagement likely compounds their vulnerability and worsens their overall risk profile. To address this, hospitals should integrate mental health care and psychological support into standard post-assault protocols. Even patients who do not meet criteria for acute psychiatric holds should be counselled and evaluated by psychotherapists, social workers, or psychiatrists, and promptly offered outpatient follow-up. A well-studied form of secondary prevention is ED-based video interventions after SA. These videos use the principles of cognitive behavioral therapy (CBT) and discuss coping mechanisms, warning signs for mental health emergencies, strategies for managing stress and emotions, and the details of the SAFE exam to decrease distress. These videos have consistently shown to decrease substance use and decrease PTSD symptoms post-SA (Gilmore et al., 2019, 2021; Resnick et al., 2007). This may be a low resource intervention to prevent or decrease the development or worsening of mental health symptoms in this population. Partnerships with community organizations can also help to bridge this gap. These organizations provide trained advocates who can be requested by ED staff and provide prompt emotional support as well as knowledgeable guidance and assistance during the waiting and examination process (*ECLI-VIBES*, 2023; Greeson & Campbell, 2013). Many of these organizations consist of volunteer advocates, offering a minimal cost burden for a hospital to implement.

This study has several limitations. First, its findings may not be generalizable to hospitals in urban or rural settings, as our institution serves a suburban population near a large state university. Nonetheless, our racial demographics distribution was representative of the local population, with approximately 65% of our county identifying as non-Hispanic White (Suffolk County, New York, n.d.). Second, the reliance on medical chart review includes potential biases, as documentation may be incomplete or influenced by recall or social desirability factors. Third, a significant proportion of entries contained unknown responses for social history and demographic variables, reducing our sample size and status power for certain analyses. Furthermore, if a patient decides to report to law enforcement, their SAFE records become evidence and therefore largely inaccessible to research data collection and evaluation of programs such as ours.

Conclusion

Our review of 309 emergency-department presentations for sexual assault over a 9.5-year span characterizes who seeks care, what services they receive, and which factors shape engagement with forensic and legal processes. Patients were predominantly young, female, and White, yet almost one in five assaults occurred in institutional settings such as group or nursing homes, highlighting the burden borne by disabled and elder populations. These findings have immediate practice implications. First, they reaffirm the value of an on-call SAFE program but also expose its limits when wait-times or stigma deter participation. Utilizing trained rape-crisis advocates at triage and expanding cross-facility SAFE coverage could narrow this gap. Second, uniform, trauma-informed communication, including non-stigmatizing ICD-10 coding and explicit mental-health screening can validate patients' experiences and reduce barriers to care. Third, intentional partnerships with community SART organizations offer a low-cost, high-impact solution to support the unique needs of these patients after an assault.

At a systems level, our data argue for stronger safeguarding policies for residents of long-term care and congregate living facilities, and mental-health care even in the absence of an overt

psychiatric crisis. Clarifying institutional coding protocols could both honor survivor narratives and improve surveillance accuracy for public-health planning. Further, hospital-wide, case-based training in trauma-informed care should be employed for all ED clinicians, not only SAFE personnel, so that every interaction, from triage to discharge, promotes autonomy, mitigates re-traumatization, and encourages follow-up.

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Appendix A

Data Operationalization

Variable Name	Variable Description	Response/Coding and Recoding	Dependent or Independent Variable
Demographics			
Age	Patient age as reported in electronic medical record (EMR).	Continuous	Dependent
Sex	Patient sex assigned at birth as self-reported in EMR.	0- Female 1- Male	Dependent
Race	Patient race (with U.S. Census categories) as self-reported in EMR.	1- Asian 2- Black/African American 3- Caucasian 4- Other 5- Missing	Dependent
Ethnicity	Patient ethnicity (with U.S. Census categories) as self-reported in EMR.	1- Non-Hispanic 2- Hispanic 3- Missing	Dependent
Encounter Payment Method	As documented for encounter with hospital emergency department (ED) for evaluation pertaining to sexual assault.	1- Private insurance 2- Medicaid 3- Medicare 4- Self-Pay 5- Special billing 6- Missing	Dependent
Sexually Active	Patient sexual activity status as documented by ED personnel in patient's EMR.	0- No 1- Yes 2- Missing	Dependent
History of previous sexual assault, sexual trauma or rape	Explicit documentation of previous history of sexual assault, sexual trauma, or rape as per report by patient. No (0) was coded if ED providers documented this as a pertinent negative as part of their history of present illness or past medical history. If no clear documentation of this history, coded as Missing (2).	0- No 1- Yes 2- Missing	Dependent
Medical Comorbidities	All medical, non-psychiatric disorders/diagnoses as described in ED providers' documentation of past medical history. If no clear documentation of the patient's medical history, this was coded as Missing (2).	0- None 1- Any non-psychiatric diagnosis/co-morbidity 2- Missing	Independent
Neurodevelopmental Past Medical History	For those with documented medical history as described	0- None	Independent

Variable Name	Variable Description	Response/Coding and Recoding	Dependent or Independent Variable
	above- all neurodevelopmental diagnoses as described in ED providers' documentation of past medical history, including: ADD/ADHD, autism spectrum disorder, developmental delay, cerebral palsy, intellectual disability, etc.	1- Any neurodevelopmental diagnosis	
Psychiatric Past Medical History	For those with documented medical history as described above- all psychiatric diagnoses as described in ED providers' documentation of past medical history, including anxiety disorders, bipolar disorders, depression, obsessive-compulsive disorder, personality disorders, post-traumatic stress disorder, schizophrenia, etc.	0- None 1- Any psychiatric diagnosis Further recoded as an individual variable per psychiatric diagnosis.	Independent
Characteristics of Emergency Department Visit			
Year	The year of encounter with ED for sexual assault evaluation.	1- 2015 2- 2016 3- 2017 4- 2018 5- 2019 6- 2020 7- 2021 8- 2022 9- 2023 10- 2024	Dependent
Time	The time of encounter with ED for sexual assault evaluation.	1- 0:00-5:59 2- 6:00-11:59 3- 12:00-17:59 4- 18:00-23:59	Dependent
SAFE Evaluation Requested	Evaluation was requested if ever recorded as ED provider's plan in visit notes.	0- No 1- Yes	Dependent
Patient Left Prior to SAFE Arrival	Documented as Yes (1) if no evidence of evaluation by SAFE providers in EMR after clear documentation of request, or if explicitly stated by further ED providers' documentation that patient left prior to being evaluated by SAFE personnel.	0- No 1- Yes	Dependent

Variable Name	Variable Description	Response/Coding and Recoding	Dependent or Independent Variable
Sexual Offense Evidence Kit Collected	Identified by checkbox on documentation uploaded and included in EMR from SAFE provider detailing which sections of SAFE evaluation were completed during encounter. No (0) include those who consented to evidence collection and did not complete evidence collection, and those who did not consent to evidence collection. Those with incomplete documentation or no evidence of SAFE form in EMR were marked as Missing (2).	0- No 1- Yes 2- Missing	Dependent
HIV Testing Ordered	Identified by checkbox on documentation uploaded and included in EMR from SAFE provider detailing which sections of SAFE evaluation were completed during encounter and cross-referenced with laboratory testing orders placed in EMR for HIV testing.	0- No 1- Yes 2- Not offered	Dependent
Urine Pregnancy Testing Ordered	Identified by checkbox on documentation uploaded and included in EMR from SAFE provider detailing which sections of SAFE evaluation were completed during encounter and cross-referenced with orders placed in EMR for urine pregnancy test (UPT). Not Collected (0) included those who were not offered UPT, ie. those assigned male-sex at birth.	0- Not Collected 1- Yes	Dependent
Urine Toxicology Ordered	Toxicology was considered completed based on existing results of testing and completed documentation of order placed by ED personnel for laboratory testing.	0- No 1- Yes	Dependent
STI/STD Testing Ordered	Testing was considered completed based on existing results of testing and completed documentation of	0- No 1- Yes	Dependent

Variable Name	Variable Description	Response/Coding and Recoding	Dependent or Independent Variable
	order placed by ED personnel for laboratory testing. Includes Chlamydia trachomatis, Neisseria gonorrhoeae, Treponema pallidum, Hepatitis (A, B, C) testing.		
Any STI Prophylaxis/Treatment Provided	Identified by checkboxes on documentation associated with standard HIV, Chlamydia, Gonorrhea and other sexually transmitted infection prophylactic regimens as uploaded and included in EMR from SAFE provider detailing which sections of SAFE evaluation were completed during encounter and cross-referenced with orders placed for STI prophylaxis.	0- No 1- Yes	Dependent
Emergency Contraception Ordered	Identified by checkbox on documentation uploaded and included in EMR in EMR from SAFE provider detailing which sections of SAFE evaluation were completed during encounter and cross-referenced with orders placed for levonorgestrel. Not Offered (2) included those who were ineligible to receive levonorgestrel, ie. those assigned male-sex at birth and those with a positive pregnancy test.	0- No 1- Yes 2- Not offered	Dependent
Law Enforcement Involvement	Law enforcement was considered involved if one of the following scenarios occurred: a) ED provider explicitly documented law enforcement involvement or b) Documentation from local police departments pertaining to the events found in patient's EMR.	0- No 1- Yes	Dependent
Social Work Involvement	Social work was considered involved if there was explicit mention of consultation order placed by ED provider or documentation from social work personnel pertaining to the ED encounter in patient's EMR.	0- No 1- Yes	Dependent

Variable Name	Variable Description	Response/Coding and Recoding	Dependent or Independent Variable
Follow up care scheduled	Follow up care scheduled was marked as Yes (1) if there was evidence of need for follow up with primary care provider, social work, etc. as part of ED provider's treatment and/or discharge plan.	0- No 1- Yes	Dependent
Characteristics of Assault			
Location of Assault	The location of the incident as documented in ED or SAFE provider notes. If no clear documentation of location, coded as Missing (9).	1- Car 2- Family, Friend, or Perpetrator's Home --> further titled "other house" 3- Group Home/Nursing Home/Rehab Facility/Hospital 4- Patient's Home 5- Hotel 6- Party 7- School Campus 8- Shelter/Jail 9- Missing	Independent
Relationship with Assailant	The relationship of the patient with their assailant as documented in ED or SAFE provider notes. If no clear documentation of relationship, coded as Missing (10).	1- Acquaintance/ Friend 2- Current or Former-Partner 3- Caregiver or Facility Staff Member 4- Doctor 5- Family Member 6- Landlord 7- Law Enforcement Officer 8- Neighbor/Fellow Group Home Member 9- No Relationship/ Stranger 10- Missing Further recoded as: 0- No relationship 1- Any relationship 2- Missing	Independent

Variable Name	Variable Description	Response/Coding and Recoding	Dependent or Independent Variable
Sex of Assailant	The sex of the assailant as documented in ED or SAFE provider notes. If no clear documentation of sex, coded as Missing (4). Due to heterogeneity of the descriptions of incidents involving multiple assailants, descriptions of multiple assailants were coded as Multiple Individuals (3) regardless of distribution of sexes of the individuals.	1- One Female 2- One Male 3- Multiple Individuals 4- Missing	Dependent
Traumatic Injury Associated with Assault	Injuries explicitly noted in narrative or physical exam description in ED or SAFE provider's documentation. Description of any physical injury was marked as Yes (1).	0- No 1- Yes	Dependent
Drug facilitation of assault	Assaults were considered potentially facilitated by drugs in the following scenarios: a) explicit mention of concern related to being drugged in documented narrative by ED or SAFE personnel or, b) documentation describing patient narrative of alcohol affecting the patient more than is typical for them.	0- No 1- Yes	Dependent
Awake or regained consciousness during assault	Explicit documentation of patient noting that they were awake or regained consciousness during assault.

If there was no or limited documentation regarding the events surround the assault, including details regarding patient's consciousness during the event, this was coded Missing (2). | 0- No 1- Yes 2- Missing | Dependent |
| Recalled events of the assault | Explicit documentation of patient noting that they recalled the events of the assault.

If there was no or limited documentation regarding the events surround the assault, including details regarding | 0- No 1- Yes 2- Missing | Dependent |

Variable Name	Variable Description	Response/Coding and Recoding	Dependent or Independent Variable
	patient's memory of the event, this was coded Missing (2).		
Sexual Assault as Primary Complaint	Sexual assault was considered the primary complaint of a patient based on the description of the chief complaint as documented by ED providers. Those with incomplete documentation or no evidence of SAFE form in EMR were marked as Missing (2).	0- No 1- Yes 2- Missing	Dependent
Sexual Assault Occurred within 96 Hours of Presentation	Identified by checkbox on documentation uploaded and included in EMR from SAFE provider and cross-referenced with ED provider notation of timeline of events. Those with incomplete documentation or no evidence of SAFE form in EMR were marked as Missing (2).	0- No 1- Yes 2- Missing	Dependent
Patient consents to evidence collection	Identified by checkbox on documentation uploaded and included in EMR from SAFE provider and cross-referenced with ED provider documentation. Those with incomplete documentation or no evidence of SAFE form in EMR were marked as Missing (2). If the checkbox for evidence kit collected (see variable titled: Sexual Offense Evidence Kit Collected) was checked, this variable was considered to be a yes as well, even in the event of the absence of this documentation as described above.	0- No 1- Yes 2- Missing	

Variable Name	Variable Description	Response/Coding and Recoding	Dependent or Independent Variable
Patient with capacity to consent to SAFE exam	A patient was considered to have capacity to consent to SANE exam if they met the following requirements: a) no documentation of health care proxy per ED or SAFE provider's documentation b) no explicit documentation by ED personnel stating that patient lacks decision making capacity for any reason c) SAFE provider documentation checkbox stating patient has capacity to consent to SAFE (if available) Those with incomplete documentation or no evidence of SAFE form in EMR were marked as Missing (2).	0- No 1- Yes 2- Missing	Dependent

Appendix B

Baseline demographic characteristics

Characteristic	N (%) or Median (IQR)
Age	27 (22-37)
Sex	
Female	275 (89.0)
Male	34 (11.0)
Race	
Asian	7 (2.3)
Black/African American	36 (11.7)
Caucasian	201 (65.3)
Other	24 (7.8)
Missing	41 (13.3)
Hispanic ethnicity	
Hispanic	13 (4.2)
Non-Hispanic	235 (76.1)
Missing	61 (19.7)
Encounter payment method	
Private insurance	11 (3.6)
Medicaid	46 (14.9)
Medicare	13 (4.2)
Self-Pay	4 (1.3)
Special billing	231 (74.8)
Missing	4 (1.3)
Sexually active	
Yes	61 (19.9)
No	19 (6.2)
Missing	227 (73.9)
History of previous sexual assault, sexual trauma or rape	
Yes	46 (14.9)
No	50 (16.2)
Missing	211 (68.9)
Comorbidity/Past Medical History	
Medical Comorbidities	124 (40.1)
Neurodevelopmental past medical history	39 (12.6)
Anxiety disorder	64 (20.7)
Bipolar disorder	33 (10.7)
Depression	58 (18.8)
Obsessive compulsive disorder	2 (0.6)
Personality disorder	3 (1.0
PTSD	21 (6.8)
Schizophrenia/Schizoaffective disorder	13 (4.2)

Appendix C

Characteristics of ED Visit

Characteristic	N (%) or Median (IQR)
Year	
2015	9 (2.9)
2016	17 (5.5)
2017	51 (16.5)
2018	65 (21.0)
2019	44 (14.2)
2020	24 (7.8)
2021	27 (8.7)
2022	36 (11.7)
2023	30 (9.7)
2024	6 (1.9)
Time	
0:00-5:59	56 (18.1)
6:00-11:59	50 (16.2)
12:00-17:59	109 (35.3)
18:00-23:59	94 (30.4)
SAFE evaluation requested	
Yes	268 (86.7)
No	41 (13.3)
Patient left prior to SAFE arrival	
Yes	20 (7.5)
No	248 (92.5)
Sexual offense evidence kit collected	
Yes	128 (42.0)
No	102 (33.4)
Missing	75 (24.6)
HIV testing ordered	
Yes	231 (74.8)
No	52 (16.8)
Not Offered	26 (8.4)
Urine pregnancy testing ordered	
Yes	249 (80.5)
Not collected*	60 (19.4)
Urine toxicology ordered	
Yes	72 (23.3)
Not collected	237 (76.7)
STI/STD testing ordered [†]	
Yes	106 (34.3)
Not collected	203 (67.7)

Characteristic	N (%) or Median (IQR)
Any STI prophylaxis/treatment provided [‡]	
Yes	171 (55.3)
No	138 (44.7)
Emergency contraception ordered	
Yes	84 (27.1)
No	198 (64.1)
Not Offered [§]	27 (8.7)
Law enforcement involved	
Yes	131 (43.0)
No	174 (57.0)
Social work involved	
Yes	66 (21.7)
No	28 (78.3)
Follow-up care scheduled	
Yes	36 (11.8)
No	268 (88.2)

*Includes patients who were assigned male sex at birth and therefore not offered urine pregnancy test

†Includes Chlamydia trachomatis, Neisseria gonorrhoeae, Treponema pallidum, Hepatitis (A, B, C)

‡STI Prophylactic medications included the standard post-exposure prophylaxis regimens (and allergy alternative regimen) for Chlamydia trachomatis, Neisseria gonorrhoeae, Hepatitis, and HIV

§Includes patients who were assigned male sex at birth and therefore not offered emergency contraception. Also include patients who were pregnant (as evidenced by positive β-HCG).

Appendix D

Characteristics of Assault

Characteristic	N (%) or Median (IQR)
Location of incident	
Car	12 (3.9)
Other house (not belonging to patient)	44 (14.2)
Group home/Nursing home/Rehab facility/Hospital	32 (10.4)
Patient's home	32 (10.4)
Hotel	17 (5.5)
Party	12 (3.9)
Other public location	36 (11.7)
School campus	8 (2.6)
Shelter/Jail	6 (1.9)
Missing	110 (35.6)
Relationship with assailant	
Acquaintance/Friend	60 (19.4)
Current or Former partner	36 (11.7)
Caregiver or Facility staff member	13 (4.2)
Doctor	2 (0.6)
Family member	5 (1.6)
Landlord	2 (0.6)
Law enforcement officer	3 (1.0)
Neighbor/Fellow group home member	9 (2.9)
No Relationship/Stranger	59 (19.1)
Missing	120 (38.8)
Sex of assailant	
Female	2 (0.6)
Male	169 (54.7)
Multiple individuals	19 (6.1)
Missing	119 (38.5)
Traumatic injury associated with assault	
Yes	86 (27.8)
No	213 (70.3)
Missing	10 (3.2)
Penetration type	
None	12 (3.9)
Fingers	17 (5.5)
Object	4 (1.3)
Penile	93 (30.1)
Missing	177 (57.3)
Reported potential drugging associated with assault	
Yes	79 (25.6)
No	151 (49.0)

Characteristic	N (%) or Median (IQR)
Missing	78 (25.3)
Awake or regained consciousness during assault	
Yes	132 (42.7)
No	131 (42.4)
Missing	46 (14.9)
Recalled events of the assault	
Yes	140 (45.3)
No	122 (39.5)
Missing	47 (15.2)
Sexual assault as primary complaint	
Yes	283 (91.6)
No	26 (8.4)
Sexual assault occurred within 96 hours of presentation	
Yes	291 (94.2)
No	15 (4.9)
Missing	3 (1.0)
Patient consents to evidence collection	
Yes	220 (71.2)
No	50 (16.2)
Missing	39 (12.6)
Patient with capacity to consent to SAFE exam	
Yes	277 (89.6)
No	30 (9.7)
Missing	2 (0.6)