

Improving Emergency Department Care for Pediatric Victims of Sexual Abuse

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BACKGROUND AND OBJECTIVE: Evidence-based medical care of sexual abuse victims who present to the pediatric emergency department (PED) is necessary to facilitate forensic evidence collection and prevent pregnancy and sexually transmitted infections. Adherence to testing and treatment guidelines remains low in PEDs, despite recommendations from the American Academy of Pediatrics and Centers for Disease Control and Prevention. We aimed to increase the proportion of patient encounters at a PED for reported sexual abuse that receive algorithm-adherent care from 57% to 90% within 12 months.

METHODS: Our team of PED and child abuse pediatricians outlined our theory for improvement, and multiple plan-do-study-act cycles were conducted to test interventions that were aimed at key drivers. Interventions included the construction of a best practice algorithm derived from published guidelines, targeted clinician education, and integration of an electronic order set. Our primary outcome was the proportion of patient encounters in which care adhered to algorithm recommendations. Data were abstracted from the records of all patient encounters evaluated in the PED for reported sexual abuse.

RESULTS: We analyzed 657 visits between July 2015 and January 2018. The proportion of patient encounters with algorithm-adherent care improved from 57% to 87% during the study period. This improvement has been sustained for 13 months. Failure to test for hepatitis and syphilis constituted the majority of nonadherent care.

CONCLUSIONS: Using improvement methodology, we successfully increased algorithm-adherent evaluation and management of patients presenting for sexual abuse. Targeted education and an electronic order set were associated with improved adherence to a novel care algorithm.

Sexual violence is widespread in the United States, and many victims are <18 years old.¹ Approximately 11.3% of female high school students and 3.5% of male high school students report being forced to have sexual intercourse.² After sexual abuse, child and adolescent victims frequently seek initial care in an emergency department.³ Both the Centers for Disease Control and Prevention (CDC) and the American Academy

of Pediatrics (AAP) have published recommendations for the care of child and adolescent victims of sexual abuse.^{4,5} Appropriate medical care is vital to facilitate forensic evidence collection and prevent pregnancy and sexually transmitted infections (STIs). Despite these published recommendations, adherence to recommended care in the pediatric emergency department (PED) is low.^{6,7} Schilling et al⁶ found that only 44% of

abstract



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DOI: <https://doi.org/10.1542/peds.2018-1811>

Accepted for publication Aug 2, 2018

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PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

To cite: Hoehn EF, Overmann KM, Fananapazir N, et al. Improving Emergency Department Care for Pediatric Victims of Sexual Abuse. *Pediatrics*. 2018;142(6):e20181811

adolescents received recommended testing, and 35% received the recommended prophylactic treatment. They also found that the presence of a clinical algorithm or guideline increased the proportion of patients who received recommended care.⁶

We formed a crossdivisional team of pediatric emergency medicine (PEM) and child abuse pediatricians to decrease variation in care provided in the PED to children presenting for reported sexual abuse. Because we theorized that provider lack of knowledge of published recommendations contributed to variation in care, we collaborated to design and implement a novel algorithm that was based on published guidelines and expert consensus. Our overall goal was to improve the care of patients with reported sexual abuse in our PED. We aimed to increase the proportion of patient encounters in our PED for reported sexual abuse that receive algorithm-adherent care from 57% to 90% within 12 months. Our purpose with this study is to describe the strategy for the design and implementation of a standardized approach to the medical evaluation of children and adolescents with reported sexual abuse and to evaluate its effect on algorithm adherence among providers in the PED.

METHODS

Setting and Context

This quality improvement initiative was conducted at a large pediatric tertiary care center and its satellite community hospital with an annual emergency department volume of ~100 000 patients. This 600–inpatient bed pediatric institution is a level I trauma center responsible for 85% to 90% of pediatric admissions from a population base of 2 000 000 people.

The PED is staffed by PEM faculty, clinical staff pediatricians, nurse practitioners, and resident physicians. All providers can care for patients with reported sexual abuse, although nurse practitioners and resident physicians are supervised by a PEM faculty or clinical staff pediatrician. Our PED is also staffed with social workers and pediatric sexual assault nurse examiners (P-SANEs), available at all times. A social worker is involved with every case of suspected sexual abuse. P-SANEs are involved only in cases in which evidence collection is indicated. The workflow in our PED is such that a social worker completes a medical interview and discusses the sexual abuse disclosure with the medical provider. The provider is subsequently responsible for the physical examination and medical management of the patient.

This quality improvement project was designed to improve the provision of recommended medical management for patients with reported sexual abuse. The primary process measure was the proportion of PED encounters for reported sexual abuse that was adherent to algorithm recommendations. The project was evaluated by the institutional review board, and it was determined that the project did not meet the definition of human subjects research.

A team of PEM faculty, child abuse pediatricians, child abuse fellows, and PEM fellows convened with the goal of improving care of victims of sexual abuse in the PED. The team began by performing a needs assessment to identify areas for improvement and understand PED provider confidence with evaluating and treating reported sexual abuse. The needs assessment was conducted as an anonymous electronic survey completed by PEM faculty, PEM fellows, clinical staff physicians, and

resident physicians. The survey revealed that the majority of providers did not feel “very” or “extremely confident” with the medical management of patients presenting with reported sexual abuse. Respondents indicated that an evidence-based care algorithm and an order set within our electronic medical record (EMR) would be the most helpful potential interventions.

Interventions

We constructed a key driver diagram to make the theory for improvement explicit (Fig 1). The drivers and interventions were iteratively revised and added as the team evaluated process failures throughout the study period. The team used multiple plan-do-study-act cycles to target key drivers of algorithm-adherent treatment of reported sexual abuse. Interventions included evidence-based algorithm development, targeted education, integration of the algorithm into provider workflow, and order set implementation to support algorithm adherence. Data were monitored over time to evaluate the impact of each sequential intervention and to assess for special cause variation.

Algorithm

The team developed an evidence-based care algorithm for the medical management of patients with reported sexual abuse (Supplemental Figs 4 and 5). The algorithm was based on CDC and AAP evidence-based recommendations and local expert consensus.^{4,5,8}

The algorithm includes care recommendations for male and female patients, prepubertal and adolescent patients, and for victims in which the reported abuse occurred at various times before presentation to the PED. The algorithm provides recommendations for evidence collection, HIV postexposure

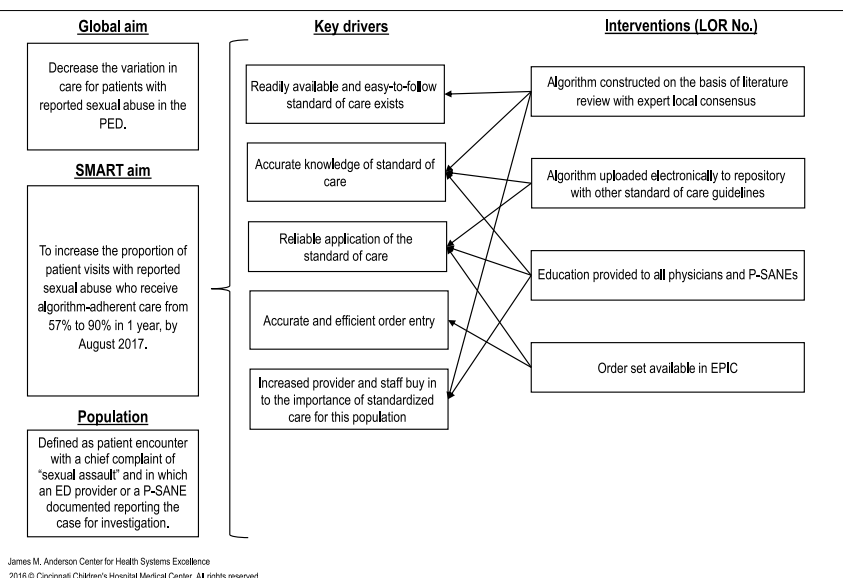


FIGURE 1

Sexual abuse evaluation and treatment key driver diagram. ED, emergency department; EPIC, site-specific electronic medical record; LOR, level of reliability; SMART, specific, measurable, attainable, realistic, and timely.

prophylaxis (PEP), STI testing and treatment, and emergency contraception. The algorithm is divided on the basis of pubertal status as well as the time since the last known contact with the alleged perpetrator (AP).

Prepubertal children have a lower incidence of STIs and lower risk of ascending infections compared with adolescents.⁹ The presence of a confirmed STI in prepubertal children can have unique forensic implications.⁵ Therefore, STI testing, but not prophylactic treatment, is recommended for prepubertal children.⁹

For adolescent victims of sexual abuse, there are incongruous recommendations for STI testing in the setting of acute (<72 hours) assault, because it is difficult to interpret a positive test result.¹⁰ Local expert consensus agreed that testing was not required if prophylactic treatment was given but highly recommended if treatment was not given and that it should be

considered on the basis of clinician discretion or patient preference.

Recommended treatment also differs on the basis of the amount of time since contact with the AP. Discussion regarding HIV PEP is recommended within the first 72 hours since reported abuse and based on risk factors outlined in the algorithm. Evidence collection is recommended within the first 72 hours since reported abuse but considered up to 96 hours in adolescent patients with genital to genital contact.^{4,5} Emergency contraception is recommended for adolescent females who have (or may have) genital to genital contact and present to the PED within 120 hours since reported contact.⁴ Blood testing for hepatitis B, hepatitis C, HIV, and syphilis is recommended for any reported contact that could lead to transmission in all age groups regardless of the time since last contact with the AP.^{4,5} The algorithm was integrated into the PED workflow by embedding it into the EMR in July 2016.

Education

Education of PEM providers (fellows, faculty, and clinical staff) occurred at our monthly division staff meeting in June 2016. Education of pediatric residents occurred in August 2016 at a standard resident lecture time. The education consisted of a slide presentation outlining the evidence for the recommendations and a detailed introduction to the algorithm. We also provided education to the P-SANEs and PED social workers in October and November 2016, respectively.

Order Set

A point-of-care order set was developed, with orders divided into categories on the basis of pubertal status and the amount of time since AP contact. The order set was integrated into the EMR in January 2017. A link to the algorithm was embedded in the order set to facilitate rapid algorithm review at the time of order placement.

Study of the Interventions

Data were compiled from the EMR between July 2015 and January 2018 to identify eligible PED encounters for reported sexual abuse. We began by identifying charts with a chief complaint of "alleged sexual assault." Because of our triage process, it is rare for concerns about sexual abuse to arise without this chief complaint. However, many patients with this chief complaint may ultimately not warrant further forensic, investigative, or medical evaluation after a social work assessment, in which case the algorithm would not apply. Therefore, we narrowed our inclusion criteria to include only patients with both a chief complaint of "alleged sexual assault" and a note indicating that a child protective services report was made or an examination by a P-SANE was completed. This subset of patient encounters with reported sexual

abuse was our target population of interest.

A standardized chart review process was completed by E.F.H., K.M.O., N.F., B.L.B., and E.M.D. Any uncertainty about documentation or adherence to the sexual abuse algorithm was reviewed with child abuse pediatricians (E.M.D. and B.L.B.) for consensus. Encounters were considered adherent to the algorithm if recommended testing or treatment was offered but refused by the patient or patient's guardian, and documentation of discussion and refusal was evident on chart review.

Measures

Our operational definition for our main process measure is the proportion of patient visits in which algorithm-adherent care was provided for the evaluation and treatment of patients presenting to our emergency department with reported sexual abuse. The denominator for this measure was all encounters with both a chief complaint of "alleged sexual assault" and a note indicating report of suspected sexual abuse to child protective services or an examination conducted by a P-SANE. The numerator for this measure was encounters in which the evaluation was adherent to all recommended testing and treatment aspects of the algorithm.

Analysis

A *P*-chart was constructed to demonstrate the proportion of eligible patient encounters that was adherent to the algorithm. The process measure was tracked over time on a statistical process control chart to evaluate the impact of the described interventions. The *P*-chart was analyzed by using the rules for interpretation of a Shewhart chart to identify special cause.¹¹ In addition, we identified

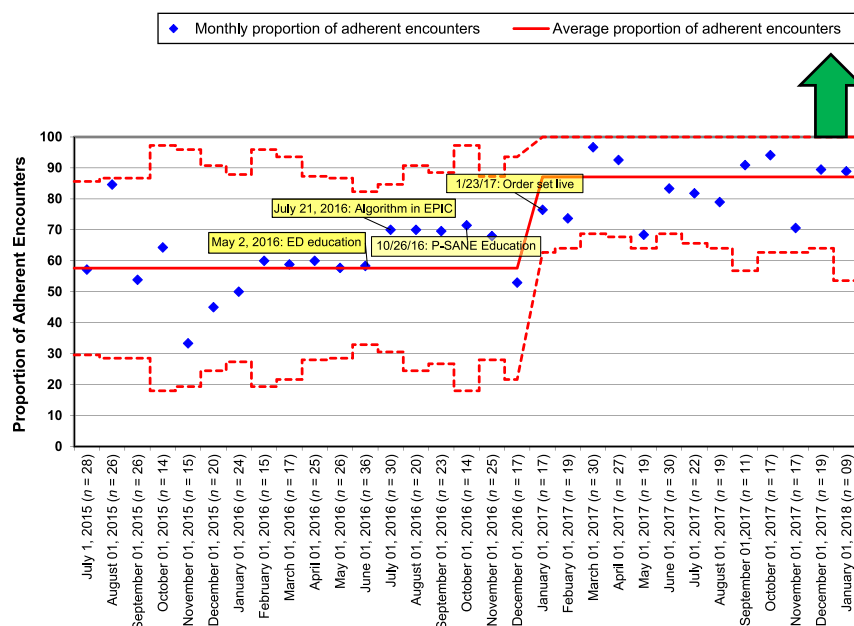


FIGURE 2

Proportion of encounters for reported sexual abuse with algorithm-adherent care, July 2015–January 2018. ED, emergency department; EPIC, site-specific electronic medical record.

each component of recommended care that was missed when encounters were not adherent to the algorithm recommendations.

RESULTS

We evaluated a total of 657 visits between July 2015 and January 2018. Adherence to algorithm recommendations improved from a baseline of 57.6% to 87.1% (Fig 2). Special cause variation was demonstrated in January 2017, and performance at this new baseline has been sustained through January 2018. Each intervention is annotated on the *P*-chart to understand the impact on the process measure over time.

We recorded the reason for nonadherence to the algorithm and displayed them in a Pareto chart to target future interventions. Hepatitis B testing was the most common reason for nonadherence (Fig 3). Lack of hepatitis C and syphilis testing was the next most commonly identified reason for nonadherence.

DISCUSSION

Summary and Interpretation

Medical management of sexual abuse is challenging for PED providers for many reasons, including a lack of knowledge about the recommended testing and treatment that differs on the basis of the age of the patient, type of contact, and time since contact. There is significant variation in care documented in the literature.⁶ Variation in care has the potential to result in missed opportunities to provide prophylactic antibiotics against STIs, HIV PEP, emergency contraception, and baseline testing for certain bloodborne pathogens. This lack of complete medical management can have significant long-term consequences for the patient. Using quality improvement methodologies, we increased the proportion of algorithm-adherent care from 57% to 87% and sustained that improvement for 13 months. The interventions that led to improvement included the creation of an evidence-based care algorithm, embedment of that algorithm into

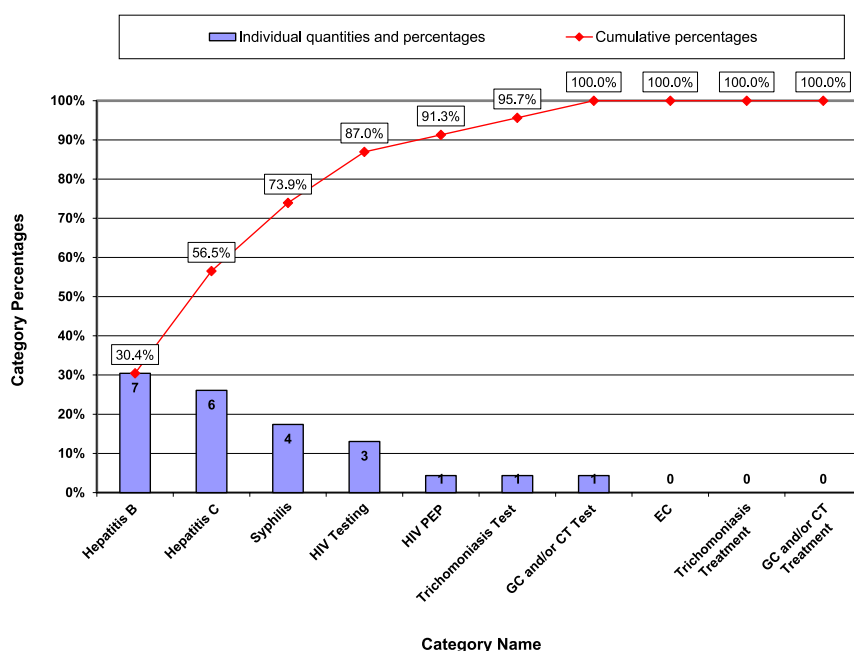


FIGURE 3
Postintervention Pareto chart of reasons for nonadherent care (February 2017–April 2017, $n = 75$).
CT, chlamydia; EC, emergency contraception; GC, gonorrhea.

which included specially trained nurse examiners and a protocol for the evaluation and treatment of sexual abuse victims.

Strengths

With this quality improvement initiative, we used a standardized algorithm for the evaluation of reported sexual abuse that was based on AAP and CDC recommendations and expert consensus among physicians with PEM and child abuse expertise. The clinical setting included a tertiary care pediatric hospital and its affiliated community-based pediatric hospital. The process revealed sustained improvement for 13 months since special cause was demonstrated, and the centerline shifted to 87%. Our quality improvement methods were used to successfully implement a standard algorithm to improve evidence-based performance in this low-frequency, high-stress event. We used key drivers to inform our efforts to improve care for each patient. We integrated interventions into the electronic workflow of the usual care environment and built on the existing infrastructure and clinical workflow of our emergency department. Ultimately, we postulate that our initial interventions provided an educational foundation that allowed the order set with embedded recommendations to shift the centerline and sustain improvement.¹³

Limitations

Our work has several limitations. It was performed at a single large pediatric center with specialized resources that may limit generalizability. Our institutional culture and resources supported

the EMR, targeted education, and creation of an order set within the EMR that aligned with the algorithm. We postulate that this improvement resulted from our structured interventions that addressed specific clinician-reported difficulties, culminating with the order set that provided embedded guidance and made it easier for clinicians to perform in accordance with best practice recommendations. Although we have not reached our goal of 90%, this substantial improvement is still important for patient care in our PED. The degree of improvement is impacted by several factors including the acceptability of the algorithm, ease of use of the algorithm, and the context in which the algorithm is applied. The team used education to raise awareness of the algorithm and order set. The team hypothesizes that additional techniques such as individualized feedback regarding compliance with standards and memory aids such as displaying the preferred order set in association with certain chief

complaints will be required to reach 90% adherence.

Nearly 80% of the failures of adherence were related to testing for infection, specifically blood testing. Notably, we were able to demonstrate excellent performance of the most emergent aspects of care, such as HIV PEP, emergency contraception, and prophylactic antibiotic administration. Although our interventions significantly improved the performance of appropriate testing, these data may help inform further targeted efforts to increase adherence and enhance outcomes.

Other studies have revealed similar improvements in care for victims of sexual abuse after the implementation of a clinical guideline.^{6,12} Goyal et al¹² demonstrated that 85% to 89% female adolescents received recommended testing and STI prophylaxis after the implementation of a sexual abuse response team,

successful implementation but may pose challenges in other settings. Although we used a robust process to include all relevant patient visits and facets of adherence, our retrospective design may not have captured all the nuances of algorithm adherence. Additionally, data collection efforts have required a large amount of manual chart review, which will make continued monitoring difficult. Although we have demonstrated 13 months of postimplementation data about algorithm adherence, it is unclear whether increased adherence will be sustained further into the future.

CONCLUSIONS

Implementation of a quality improvement initiative has resulted in increased adherence to an evidence-based care algorithm for the evaluation of patients with reported sexual abuse in our PED. Multiple key drivers have been used to propel this improvement and sustained performance, including a readily available best practice algorithm, multilevel provider education, integration of the algorithm into provider workflow, and an EMR order set constructed to support algorithm recommendations.

ABBREVIATIONS

AAP: American Academy of Pediatrics
 AP: alleged perpetrator
 CDC: Centers for Disease Control and Prevention
 EMR: electronic medical record
 PED: pediatric emergency department
 PEM: pediatric emergency medicine
 PEP: postexposure prophylaxis
 P-SANE: pediatric sexual assault nurse examiner
 STI: sexually transmitted infection

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FINANCIAL DISCLOSURE: The authors have indicated they have no financial relationships relevant to this article to disclose.

FUNDING: No external funding.

POTENTIAL CONFLICT OF INTEREST: The authors have indicated they have no potential conflicts of interest to disclose.

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